Town & Country

Hamilton County Soil & Water Conservation District

Hamilton County SWCD to Offer Winter Conservation Planning Services

Ginger Davis, District Conservationist

Winter Planning

Winter brings its own set of challenges and it is not an easy time of year to get much done outside. However, winter is the perfect time to start planning the upcoming year. Similar to reviewing finances and other year-end activities and resolutions, you should take stock in what worked and did not work for your property. Was there an area that has been causing you problems? You may be able to install practices in this area that can help improve our soil and water. This may be a perfect place to install a conservation practice and become a hero to the community. Did you have drainage problems last year? How about bare ground where you could not get growth? Was there a plant or pest that gave you trouble? You may not realize it, but if you improve the soil, you can improve our drinking water, decrease flooding, and increase carbon sequestration. The stormwater that comes off a field can carry soil and important nutrients that can negatively impact our streams and reservoirs. Practices that keep soil and nutrients in place decrease the need for nutrients and increase the nutrient and water holding capacity of our soils. This will improve the growth of plants and ultimately increase the soil quality. This would be considered a win-win because the soil and water improve. However, improving the soil takes some long-term commitments and strategies. There are a few places to get started on your heroic adventure and we are here to help you. Now is a great time to plan for the warmer seasons and form a plan of action to take care of some of the issues that have been bothering you.

Here are five simple steps to improve your soil and water and ultimately work towards your conservation success.

Step 1: Address Existing Water

Water that stays on the land for weeks on end can either mean that a natural water feature exists, or the land is poorly sloped and/or compaction has occurred. If a natural water feature exists on your property, you have probably dealt with this issue for as long as you have owned the property (except for a few dry years). These areas are important to keep for naturally wet areas are often the source of clean water to our groundwater and help filter out pollutants. Your land could be the source of water that your children's children use to drink, so protecting it can protect your family for generations. In these



Constantly wet areas of fields and yards can be problematic

naturally wet areas, you should consider practices that allow it to be set aside and enhanced. Conservation easements, improving wetland function, conservation reserve enhancement programs, and other programs are available through our office that allow for you to own and enjoy these areas while enhancing or improving them to increase their beneficial function. Some programs provide financial assistance to enhance the function, decrease property taxes, or provide conservation rental payments. Overall, improving natural areas will improve soil and water resources.

Step 2: Address Compaction

Do you have an area that is hard to drain or stays soggy for a good part of the year? Drainage issues can be the source of the problem with plants, basements, pests, and mold. A good majority of drainage issues witnessed in Hamilton county come from a compaction problem. Compacted soils are created when heavy traffic (agricultural equipment, construction equipment, or heavily used walking paths) presses the soil down and compacts its much-needed open space. When this happens, the ground switches from a sponge to a brick. Compaction can be addressed in many ways and should be considered prior to trying other drainage options. Addressing drainage or plant issues from compaction typically starts with lossening it.

This can be done with a deep ripper, which cuts like a knife deep within the ground to break through the compaction. However, if there are utility lines, electric lines, or other infrastructure, this method **cannot** be used.

Continued on page 2

Winter 2019



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Published quarterly and distributed to landowners, farm operators, teachers, local agencies, public officials, conservation organizations and other interested individuals.

1717 Pleasant St. Suite 100 Noblesville, IN 46060 317-773-2181 soil.water@hamiltoncounty.in.gov Alternative methods include long-term changes in plant populations in the area. For example, you can add cover crops, transition from turf to prairie, or plant other native vegetation. Additionally, we are looking for some other simple and short-term solutions that may be appropriate for a one-year adoption. Specifically, we are looking at whether planting root vegetables in a turf yard would break up compaction like it can in a crop field. We are also

reviewing the concepts of deep aeration that would potentially reach the compaction and if deep rooting plants would be able to break up the compacted area in the first 5 years.

Step 3: Test Your Soils

You wouldn't take a strong medication without a lab test from your doctor. The same should go for adding nutrients or fertilizers to your soil without a soil test. In step three, we are going to look at what to avoid adding to the soil because it likely already exists.



Soil quality issues can be chemical, physical, or biological

Before you grow any plants, grow your soil. This often-repeated wisdom is simple to say but requires some work to make happen. Busting up compaction, building in carbon for rich black soils, and tweaking to get the pH level that plants adore takes time and preparation. Since each patch of ground is unique, there are no quick and simple answers. Growing soil, or making it ideal for growing crops, vegetables, flowers, lawns, and other plants, means bringing it to life. Just like any system, it takes a balanced dance of multiple parts for it to work well. Having you soils tested to understand the chemical, physical, and biological workings will help you to determine what is needed to improve and create a regenerative system that can become self-sustaining. Organic soil amendments, or those derived from either plant or animal products, modify the soil structure as they decompose, allowing it to absorb and retain water and nutrients more efficiently. Some organic amendments to the soil like manure, alfalfa, cover crops, hay, straw, peat moss, compost, leaf mold, grass clippings, sawdust, wood ash, fish blood, and bone meal can add needed carbon and nutrients back into the soil. However, each one has a time and place. Mineral soil amendments like lime, gypsum, and sand can provide structure and help with pH and other issues. Fertilizers, organic or synthetic, have a significant quantity of one or more of the primary nutrients necessary for plant growth: nitrogen, phosphorus, and potassium. However, none of the amendments or fertilizers should be applied unless you already know your composition. Soil tests have come a long way in recent years. Not only can you have your soil tested to determine the plant growth nutrient needs (organic carbon, phosphorous, CEC, micronutrients, etc.), you can also get an idea of how the microbial community is working together with the plant to create a functional system. Physical and biological tests can help to ensure that the system becomes less dependent on chemical supplements and becomes a balanced environment that provides resources while minimizing inputs. In other words, a healthy soil will not require as much synthetic input, like granular fertilizers, and instead rely on what is available in the system to maintain function. You would be amazed by the improvement of the holding capacity of the soil once the biological community is in good working order. Pests are repelled, plants grow stronger, water is moved and stored for later use, and nutrients are held in place for better availability.

Step 4: Determine Plant Placement and Type

Remember the years when farm fields were not planted in a crop but left fallow, grazed, or put into a meadow? This was a great practice to cycle through a variety of plants and allow the carbon in the soils to regenerate. A

mixture of plants is needed to create a system that is balanced. Ecosystems that are healthy can withstand and recover from disasters far better than those that are degraded. Plant diversity and continuous cover are two benefits that plans can provide to help improve the soil and water resources. Bare soils have little protection to make it through the colder and wetter months. The soil's organism community that improves function needs a place to live and something to eat in the winter. Plants and plant roots provide this much-needed environment for them. The plants and roots also help protect the ground during the heavy rains that may come in the winter.



Roots of native plants improve soil and water issues

Continued on page 3

Often the type of plant we want is not the type of plant that can live where we want it. Plants that need more water often struggle on hilltops where plants that need less may not do well in valley floors. On our land, it is often hard to tell what type of plant will do well in our soils without some thorough investigation. One surefire way to get plants to grow in an area is to use those that are native to Indiana. Native plants know how to survive in our conditions because they have all the tools available to survive most conditions. Many native plants can also fulfill your landscaping needs for color, height, and aesthetics. There are landscaping tricks to make any plant work in a formed landscape. Consider hedge rows to break up more wild looking areas. Try growing a cover crop or bring in a 3rd or 4th species into the rotation. You can also add a mix of species to your lawn or convert some portion of the yard into a meadow or purposed native landscape.

Step 5: Address Pest and Disease Problems

Pest and Disease can be the most frustrating part of planning. It can come in waves or endlessly reoccur. Pests can attack one or all your plants. Disease can take ahold in an area and persist for years, which often takes drastic measures to eradicate. It can take an expert to find the actual pest or disease and we often refer people to the Purdue Plant and Pest Diagnostic Laboratory. However, one thing that can be done to ward off pest and plant disease issues is to improve conservation efforts that will help balance the system. Ecosystems that are healthy can withstand and recover from disasters far better than those that are degraded. There has even been some suggestion that in a healthy soil system, some organisms can act as a warning system to the plants that drought or pests are approaching. This allows the plant time to build the proper defense mechanism to withstand such an event.

Don't let these steps overwhelm your winter planning efforts. The Soil and Water Conservation District staff is here to help you with your conservation planning needs. Call 317-773-2181 or visit www.hamilton.swcd.org for more information.

Know your Soil pH - Mark McCauley, Resource Conservationist

So what is "Soil pH" anyway? The technical definition is *the negative logarithm* (*base 10*) *of the activity of hydrogen ions* (*H*+) *in solution*, but what good is that to the everyday gardener? Not much, but with a little understanding of the basics, it can be much clearer. In general, soil pH is a measure of how acidic or how alkaline (the opposite of acidic) the soil is. You may hear other words interchanged with alkaline, such as "high pH" or "basic". You may also hear other words interchanged with acidic, such as "low pH" or "sour". The pH scale ranges from 0 to 14, with 7 being neutral. A pH below 7 is considered acidic while a pH above 7 is considered basic.

Soil pH is an extremely important variable in soils, as it controls many other chemical processes. Most importantly it specifically affects plant nutrient availability by controlling the chemical forms of the nutrient. Soils commonly range in pH from 5.0 to 8.0. Most plants grow best when the soil pH is between 6.0 and 7.0. When the soil pH is greater than 7.0, phosphorus and some trace minerals may be less available to plants. There are some acid loving plants such as blueberries, azaleas, and rhododendrons which prefer more acid soils (less than 6.0). When the soil pH is too low (acidic), lime should be applied. When the soil pH is too high (alkaline), sulfur may be applied to help lower the pH.

In my experience in Hamilton County, the soil samples that we receive from urban areas are typically higher pH, and those from rural areas are typically lower pH. Why is that? Well I have a theory, that in urban areas, much of the land has been disturbed, exposing what would have been subsoil. This soil is often at the soil surface, or at the very least, mixed with added "top soil" or nearer the surface than would be normal. Since subsoil is naturally higher in pH, that would seem to make sense. In rural/ag areas, I think it is more of an issue of additions of certain nutrients and forms of nitrogen, which in turn can result in a lower pH, which would then require lime to help raise it.

What does this all mean for the typical home owner/land manager? It would seem to indicate that getting a routine soil test (every 3 years or so) might be wise to do. In order to grow the best lawn, flowers, fruits, vegetables, or trees you can, you need to make sure the soil is supplying the proper nutrients the best it can. A soil test can help determine that, and this is just one of the services available through your local Soil and Water Conservation District (SWCD).

Your local SWCD has been around since the 1960's and literally has decades of experience in providing sound guidance to land owners and managers for several natural resource issues. Whether it's fixing an erosion problem, building a pond, **testing the fertility of your soil** or quality of your water, developing wildlife habitat and native plantings, addressing a drainage issue, nutrient management, etc., we are here to help.

SWCD SOIL TESTING SERVICE

Basic Test Cost \$35

Analysis includes organic matter, phosphorus, potassium, calcium, magnesium, CEC, pH, buffer pH & reports

Complete Test Cost \$45

Analysis includes Basic Test plus conductivity, boron, copper, iron, manganese, sulfur, zinc & reports



Onsite Service Cost \$70

If you would like the SWCD to take the samples onsite for you (up to a maximum of 5), an additional \$70 service fee will apply.

*Your fees go back into supporting conservation programs within Hamilton County.



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Urban Conservation Spotlight

Claire Lane, Urban Conservationist

SWCD Receives \$46,850 Clean Water Indiana Grant





The District is pleased to share that we have received funding to continue our Heartland Backyard Conservation Program with a \$46,850 Clean Water Indiana Grant through the Indiana State Department of Agriculture (ISDA).

Through a 2016 Clean Water Indiana Grant, Hamilton SWCD partnered with Marion, Madison, and Hancock counties to form the Heartland Backyard Conservation Program. This program focuses on residential and other urban properties to implement conservation practices that promote clean water, reduce runoff, use native species, remove invasive species, and support soil health. Property owners are able to apply for a small grant that supports installation of conservation practices outlined in a District provided conservation plan for their property. These plans often use conservation to solve existing issues, like drainage or erosion, but can also simply improve properties in relation to clean water, wildlife habitat, etc. In the last three years, Hamilton County property owners have been paid nearly \$65,000 in cost share funds.

This new grant will allow us to continue to partner with Madison County with additional funds for cost share projects. The grant also allocates funds for development of an educational brochure and a workshop on successful installation of native prairie plants. The next cost share application deadline will be March 12th, 2019.

"The Heartland program has been very successful and I think the ISDA's continued support of the program confirms that. We're very happy we can continue providing high quality technical services and cost share to county residents through this program" said Rodney Rulon, SWCD District Board Chairman.

County residents/landowners can learn more about the Heartland program and other services the District provides by visiting www.hamiltonswcd.org. Landowners can also call 317-773-2181 or email claire.lane@hamiltoncounty.in.gov to learn more and request a site visit.

The Clean Water Indiana program is administered by the Indiana State Department of Agriculture and provides grants for conservation projects and capacity building through Indiana's Soil and Water Conservation Districts. More information is available at www.in.gov/isda/2379.

CAN YOU BELIEVE THAT YOU CAN GET HELP WITH FUNDING FOR CONSERVATION?!

White River Clean Up a Success

After a weather postponement, the annual White River Clean Up was held on October 27th. In Hamilton County, the clean up is traditionally held the first Saturday in September. This event is a partnership between the cities of Noblesville, Carmel, and Fishers with support from the SWCD and local businesses. Water based clean up efforts were canceled this year due to the opening of duck season but the Fishers/Carmel clean up was held to plant two large rain gardens at the 116th street boat launch area on the White River. Two rain gardens totaling nearly 2,000 square feet were planted near the entry area to the boat launch.

A rain garden is a depressed landscape bed that is strategically located to intercept rainwater draining off of impervious surfaces (roads, bridges, pipes, lawns, etc.). Rain gardens are planted with native flowers and grasses. The water is captured and held in the rain garden, allowing it to soak down through the soil. The soil and plant roots act as a filter cleaning the water while the water contributes to groundwater recharge. The native plants in the rain garden provide pollinator habitat, as well as beauty to the surrounding area. These two rain gardens will collect rain water from the road, bridge, and stormwater pipes allowing some of the wa



Volunteers plant a rain garden for the White River Clean Up



Volunteers prep plants for a rain garden.

ter to infiltrate into the ground and be cleansed of pollution instead of running off into the river.

Over 60 volunteers joined staff from the SWCD and city departments to finish preparations and plant 1,000 native plugs in the rain gardens. Signage and bollards around the rain gardens will help educate those utilizing the boat launch about the garden's purpose and function. We look forward to these rain gardens establishing over the next few years and invite you to stop by and take a look. Mark you calendars for the first weekend in September next fall for the 2019 White River Clean Up. More info can be found at www.whiterivercleanup.org.

Funding for these gardens was provided by the City of Fishers and City of Carmel Stormwater Departments and a \$2,000 grant from the SWCD through the Heartland Backyard Conservation Program. Special thanks to our wonderful SWCD volunteers, Pattie Clifford, Deb Rood, Grace Cochran, and Noah Golland, who helped coordinate planting efforts during the event.

Interested in being a Volunteer for SWCD?

We are always looking to grow our amazing volunteer crew! Learn more at www.hamiltonswcd.org/volunteer

Urban Agriculture Conservation Spotlight

Andrew Fritz, Urban Agriculture Conservationist

Adapting to Climate Change by Adopting Urban Conservation

Climate Change is here and the pace of increasing temperatures and precipitation is quickening "...as heat-trapping

gases, produced by humans burning fossil fuels, continue accumulating in the atmosphere." [1] This is according to a series of reports released by the Purdue Climate Change Research Center which coordinated The Indiana Climate Change Impacts Assessment (IN CCIA); a group of scientists and decision makers across the state. The reports, with a goal of showing "how a changing climate will affect state and local interests," [2] outline key findings on what impacts are being felt now and what we can expect a changing climate to look like.

The climate "...will continue changing in ways that affect our productivity, our safety, and our livelihoods." [2] This includes our personal health, forests, soil and water quality, the landscaping in our backyards, and more. The impact will be greater in urban areas. [2] Below is a snapshot of some of those changes:

- A decrease in certain types of urban trees like Black Maple, Eastern White Pine, Northern Red Oak, Sugar Maple, and Yellow-poplar will occur.
- Some pests and invasive plants like Kudzu will find a more favorable environment in Central Indiana; outcompeting native vegetation.
- The growing season will extend from 175 days to 208 days by the 2050's.
- Both droughts and heavy rain are more likely and more intense.
- Warmer winters, with fewer extreme cold days, mean that more disease-carrying insects like mosquitoes and ticks, as well as other invasive insects, could survive and expand.
- Heat stress days above 84° will increase from 46 to 78 by the 2020's which will have significant impacts on crops and native vegetation.
- "Higher temperatures and stagnant air will increase ground-level ozone production, worsening air quality." This may trigger asthma attacks, heart attacks, worsen other respiratory illnesses, and can lead to premature deaths. Allergy season will be longer and more intense, too.
- By the 2080's, it is predicted that 76 days a year will be above 95°.
- Soil could be less fertile and less able to hold nutrients and water due to high heat.

Building Green Infrastructure: 3 Approaches

According to the report titled *Maintaining Indiana's Urban Green Spaces*, green infrastructure, things like forests, green roofs, community gardens, and native plantings, "...provides economic, environmental and health benefits to cities in Indiana." [3] Adopting these practices can help us adapt to the local effects of Climate Change. Green infrastructure can be built and improved proactively. Specifically, improving biodiversity, redundancy, shifting species compositions, and building soil water holding capacity were some of the strategies suggested in the report. [3] On all of these measures and more, the HCSWCD offers free technical assistance, and in some cases, cost share funds, to help land owners, organizations, and HOA's, implement green infrastructure.

There are three ways to think about how to approach adapting to Climate Change:

- 1) **Protective Measures:** Identifying and removing invasive species while keeping existing habitat intact as a refuge has many benefits.
- 2) Enhancing Measures: Connecting areas of habitat like woodlands or prairies together with native plant corridors increase resiliency. Adding biodiversity builds a "Life Trust" that the economy of life can draw from in times of need. Replacing turf with native vegetation goes a long way, too!
- 3) Adaptive Measures: With more research being done on how plants, animals, and insects are migrating, we can proactively plant new-native trees or more of the trees that will likely survive under a warmer climate scenario (see image right).

Works Cited

[1] M. Widhalm, A. Hamlet, K. Byun, S. Robeson, M. Baldwin, P. Staten, C.-m. Chiu, J. Coleman, K. Hoogewind, M. Huber, C. Kieu, J. Yoo and J. Dukes, "Indiana's Past & Future Climate: A Report from the Indiana Climate Change Impacts Assessment," Purdue Climate Change Research Center, Purdue University, West Lafayette, Indiana, 2018.

 [2] Purdue Climate Change Research Center, "Indiana Climate Change Impacts Assessment: Putting Global Change into local Perspective," [Online]. Available: https://ag.purdue.edu/indianaclimate/.
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[3] H. Reynolds, L. Brandt, M. Widhalm, S. Fei, B. Fischer, B. Hardiman, D. Moxley, D. Sandweiss, J.

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INDIANA: Tree Habitat Suitability in 2100

Trees commonly found in urban areas

Central Till Plains		
Decrease	No change	Increase
Black maple	American hornbeam	Black oak
Eastern white pine	Bur oak	Common persimmon
Northern red oak	Ohio buckeye	Eastern hophornbeam
Sugar maple	Red maple	Eastern redbud
Yellow-poplar	Serviceberry	Eastern redcedar
	Swamp white oak	Green ash [*]
	White ash*	Hackberry
	White oak	Honeylocust
	Wild plum	River birch
		Silver maple
		Sweetgum
		Sycamore

* declining due to emerald ash borer

Shown above are the projected changes in tree habitat suitability for three physiographic regions in Indiana (regions based on Indiana Geological Survey special report 81). Projections are based on the average future climate in the year 2100 from three climate models using a high-emissions scenario. A projected species decline of >20% is classified as **Decrease**. A projected species increase of >20% is classified as **Increase**. Species with projected changes (increase or decrease) of < 20% are classified as **No Change**. Species are classified as **New** if not currently found in Indiana. *Source: Prasade et al.* (2014) and Phillips et al. (in review)

Page 7





7th Annual Indiana

Small Farm Conference

Dates: Thursday, Feb. 28 – Saturday, March 2, 2019 Location: Hendricks County 4-H Fairgrounds and Conference Complex, 1900 E Main Street, Danville, IN 46122 Contact: Tamara Benjamin <u>tamara17@purdue.edu</u> (765) 494-8490 Information/Registration: https://www.purdue.edu/dffs/smallfarms



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