

Solar Pollinator Habitat Discovery Trail

...a collaborative effort



Why solar and pollinators?

- Sustainability is a multi-pronged challenge
- Site was originally a bluebird trail with many pollinator plant species present
- When solar panels were installed, did not want to lose the biologically active integrity of the site



The solar array

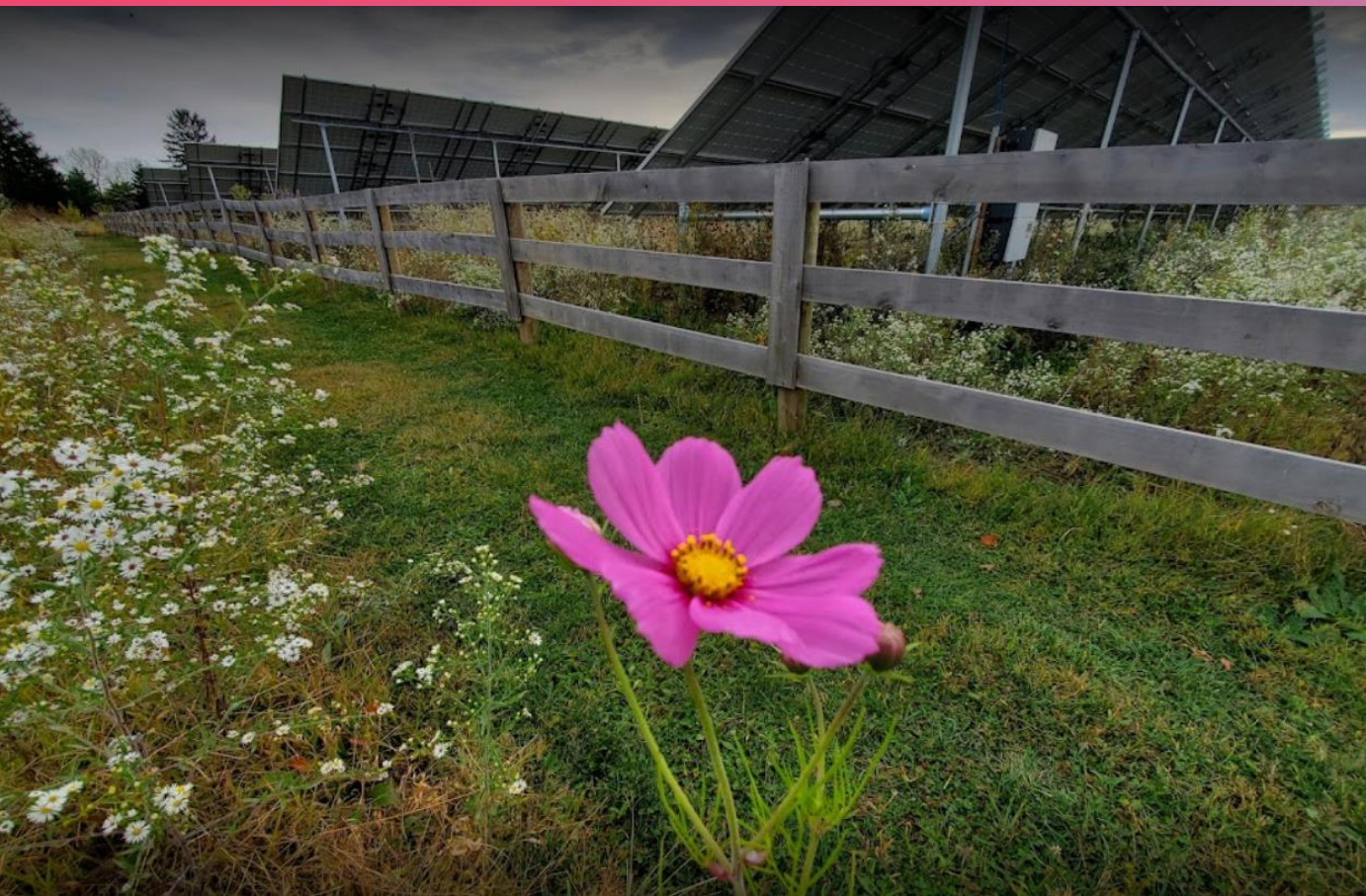


In March of 2019, the 275.6kW, 745 panel solar array came online. The common goal was to power the park while bringing awareness to the public on use of renewable energy and reducing carbon emissions. The array supplies power to the entire park including the pavilion, golf clubhouse, ball fields and park shelters.

- To further the effort in conservation, Rocknoll Energy collaborated with Ohio Pollinator Habitat Initiative on the design to allow for a native plant habitat to be planted under and around the array to attract pollinators.
- The wildflower habitat attracts multiple species of butterflies and bees making this a prime place to pollinate. This collaboration supplies the Warren County Park community an educational tool, sustainability and fixed energy cost through the tool of a PPA that Rocknoll Energy facilitated.



 **Ohio Pollinator**
Habitat Initiative



Building on the educational components...

- OEEF grant from OEPA was awarded to install the Solar Pollinator Habitat Discovery Trail
- The Discovery Trail features seven interactive learning stations along the mowed path that share the science of pollinators and solar power.

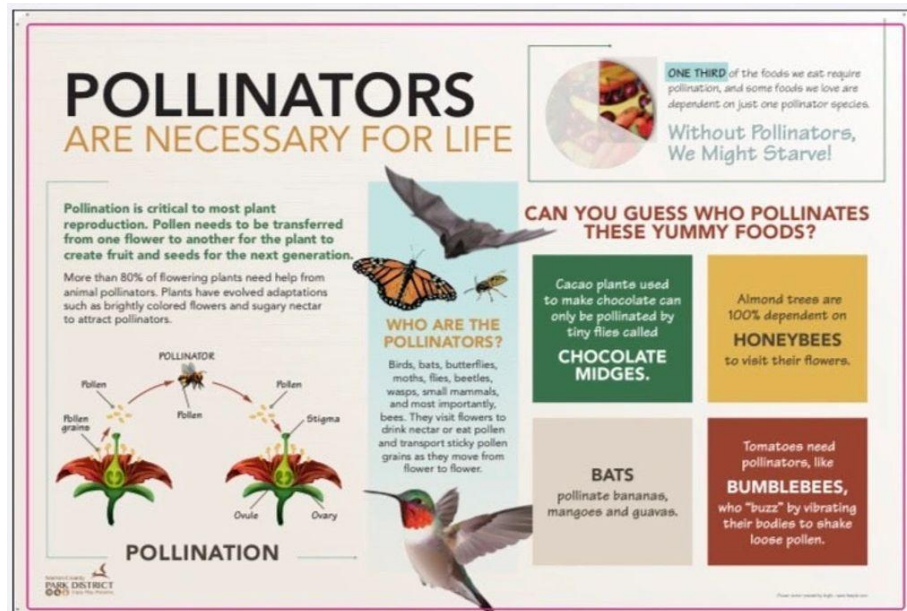
Planning and partnership...



Interactive signage: content created by educators and designed by a hired graphic designer

POLLINATORS ARE NECESSARY FOR LIFE

WHO ARE POLLINATORS AND WHY ARE THEY SO IMPORTANT TO US?



HELPING POLLINATORS AT HOME

WHAT CAN YOU DO TO HELP MAKE YOUR YARD AND GARDEN WELCOMING TO ENDANGERED POLLINATORS?



THE GREAT MONARCH MIGRATION

LEARN HOW THOSE BEAUTIFUL SUMMER BUTTERFLIES TRAVEL THOUSANDS OF MILES EACH YEAR

Like bees, beetles and flies, monarchs have four life stages: **egg**, **larva** (caterpillar), **pupa** (chrysalis), and **adult** (butterfly).

GREAT MONARCH MIGRATIONS

Monarch butterflies are the iconic symbol of summer for many gardeners but their fall migration is even more amazing!

Each fall, monarch butterflies migrate to central Mexico where they overwinter in large clusters on trees in the mountains. They return to the United States in the spring with the females laying eggs on milkweed host plants. Monarch larvae need to feed on milkweed plants to survive. At the end of the summer, after 3-4 generations, the migration starts again.

GARDENING FOR MONARCHS

While monarch caterpillars need milkweed plants to eat, the adult butterflies need nectar for water and energy. To create habitats for monarchs, it's necessary to grow both milkweeds and nectar-providing plants like asters and coneflowers. When you plant for monarchs, you are also creating habitat for many other important pollinators.

DID YOU KNOW?

- Southwest Ohio is an important summer breeding ground for monarchs!
- A fully-grown monarch caterpillar can weigh 2000 times more than when it first hatched from an egg.
- It takes at least 2 months for monarchs to fly from the north to their overwintering area in Mexico. We know this because citizen scientists all over North America, including here in Warren County, tag and track monarchs.
- The iconic orange and black coloring on monarch wings is a warning to predators that they are toxic.
- In 2014, monarch populations had declined by more than 90% in the previous twenty years due to the loss of habitats, but efforts to plant milkweed and protect their wintering grounds are beginning to make a difference!

Warren County PARK DISTRICT
Ohio's First Pollinator

SOLAR POWER + POLLINATOR HABITAT

WHY DID WE PLANT FLOWERS UNDER THE SOLAR PANELS?

SOLAR POWER + POLLINATOR HABITAT

= A PERFECT COMBINATION

We worked with the Ohio Pollinator Habitat Initiative (OPHI) to design the array to serve double duty – to generate solar power AND create a habitat for bees, butterflies, and birds.

In order to do that we had to:

- Raise the bottom panels up to a minimum 4 feet to allow plants room to grow.
- Choose plants within the fenced area that will not grow higher than 36 inches to prevent shading the panels.
- Plant beneficial native perennials that provide food and shelter for pollinators.

Can You Find These Native Plants in the Pollinator Habitat?

- MILKWEED
- HAIRY BEARDTONGUE
- GOLDEN ALEXANDER
- DOWNY WOOD MINT
- GOLDENROD
- GREAT BLUE LOBELIA

BENEFITS BEYOND POWER

Combining solar panels with pollinator habitat has benefits beyond generating power and reducing air pollution:

- Keeps the area ecologically productive.
- Saves park maintenance costs by reducing mowing and pesticide use.
- Helps filter water draining into the park's lake.
- Creates an undisturbed area for native plants.

In addition, the increased number of pollinators may improve pollination rates for local gardens and farms.

Array Height Minimum = 4 feet
Plant Height Maximum = 3 feet

Warren County PARK DISTRICT
Ohio's First Pollinator

SUNLIGHT TO ENERGY

HOW DO OUR SOLAR PANELS CONVERT SUNSHINE INTO POWER?

SUNLIGHT TO ENERGY

- 1 The sun rains down energy in the form of photons.
- 2 The electricity passes through the solar panels to the inverter changing it from direct current (DC) to alternating current (AC) before being sent to the local energy grid.
- 3 Electricity is then sent back to the park to power the park's golf carts, lights and buildings.

FEEL THE ENERGY OF THE SUN!
Place your hand over each tile. Which feels warmer?

The array has 50,000 square feet of solar cells connected with wires and circuits to capture the flow of electrons.

Electricity is then sent back to the park to power the park's golf carts, lights and buildings.

SO MUCH POTENTIAL ENERGY!
The earth absorbs more energy from the sun every hour of the day than the world uses in an entire year. We have only just begun to tap the potential of solar power!

When a photon hits a solar cell it transfers its energy to the cell material knocking loose electrons—like one ball transferring energy to another ball on a pool table. The different silicon layers inside can lose and receive electrons, creating the flow (or current) of electrons from one side to the other.

SOLAR CELL

Top Glass
Antireflective Coating
N-type Silicon
P-type Silicon
Backsheet
Current
O = Electron

THIS ARRAY WAS DESIGNED TO MAKE 456 MEGAWATT HOURS (MWH) OF ENERGY PER YEAR.

Scan the QR code to find out how much power is being generated right now.

PARK DISTRICT
Ohio's Premier Recreation

GREENER ENERGY = CLEANER AIR

HOW CAN YOU HELP USE LESS ENERGY AND CREATE CLEANER AIR?

GREENER ENERGY = CLEANER AIR

HOW CAN YOU REDUCE YOUR ENERGY IMPACT?

Home solar panels can reduce your energy use by **94%**

A typical home solar system (8 kW) can offset 8.3 metric tons of carbon emissions per year.

90% less energy is used by LED bulbs vs. standard bulbs

LED lights produce 75-90% less heat, so they're safer to operate. They can cut your energy bill by up to 80% and last 15 times longer than standard bulbs.

10% potential reduction in yearly energy use by sealing home air leaks

Consider installing weather stripping on doors, caulking around windows, and insulating your attic.

75% of the energy to do a load of laundry goes into heating the water

Using a cold-water detergent and cold setting can save utility costs.

In 2018, 82% of Ohio's electricity came from burning fossil fuels and 15% from nuclear power plants—**ONLY 3% CAME FROM RENEWABLE SOURCES.**

According to the US Environmental Protection Agency (EPA), we can all help reduce our environmental energy impact by using energy more efficiently and increasing the use of green power sources including solar and wind power.

Our **SOLAR ARRAY** will offset approximately **270 tons** of carbon dioxide and **550 pounds** of sulfur dioxide each year in Ohio. **HOORAY FOR CLEANER AIR!**

Ohio is an electric "free-choice" state. Ohio homeowners are able to choose the source of their electricity through their existing utility provider.

For more information on renewable energy plans scan the QR Code.

PARK DISTRICT
Ohio's Premier Recreation

COVID 19

So how do we get the word out...

Learn as you walk with new Warren Co. trail



NEW INTERACTIVE TRAIL COMBINES POLLINATORS AND GREEN ENERGY

Learn as you walk with new Warren Co. trail



By [Ashley Smith](#) | October 14, 2020 at 5:25 PM EDT - Updated October 14 at 6:55 PM

WARREN CO., Ohio (FOX19) - A unique trail meant to help people learn about solar energy and pollinators is now open.



Melissa Proffitt
WARREN CO SOIL & WATER CONSERVATION

Virtual Opening Ribbon Cutting



Education Video Series



Get the Community Involved!



We were awarded dozens of native plant plugs through [Project Wingspan](#). They were planted on 5/25/21, and volunteers signed up to help with watering them daily through mid-July so they could become well established!



In Person Programs!!



Questions?

Contact Us!

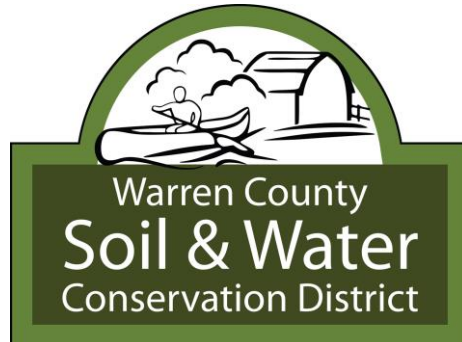
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