



# SPRING WILDFLOWERS OF OHIO'S FORESTS

GREG TORRES - HORTICULTURIST AND NATURALIST





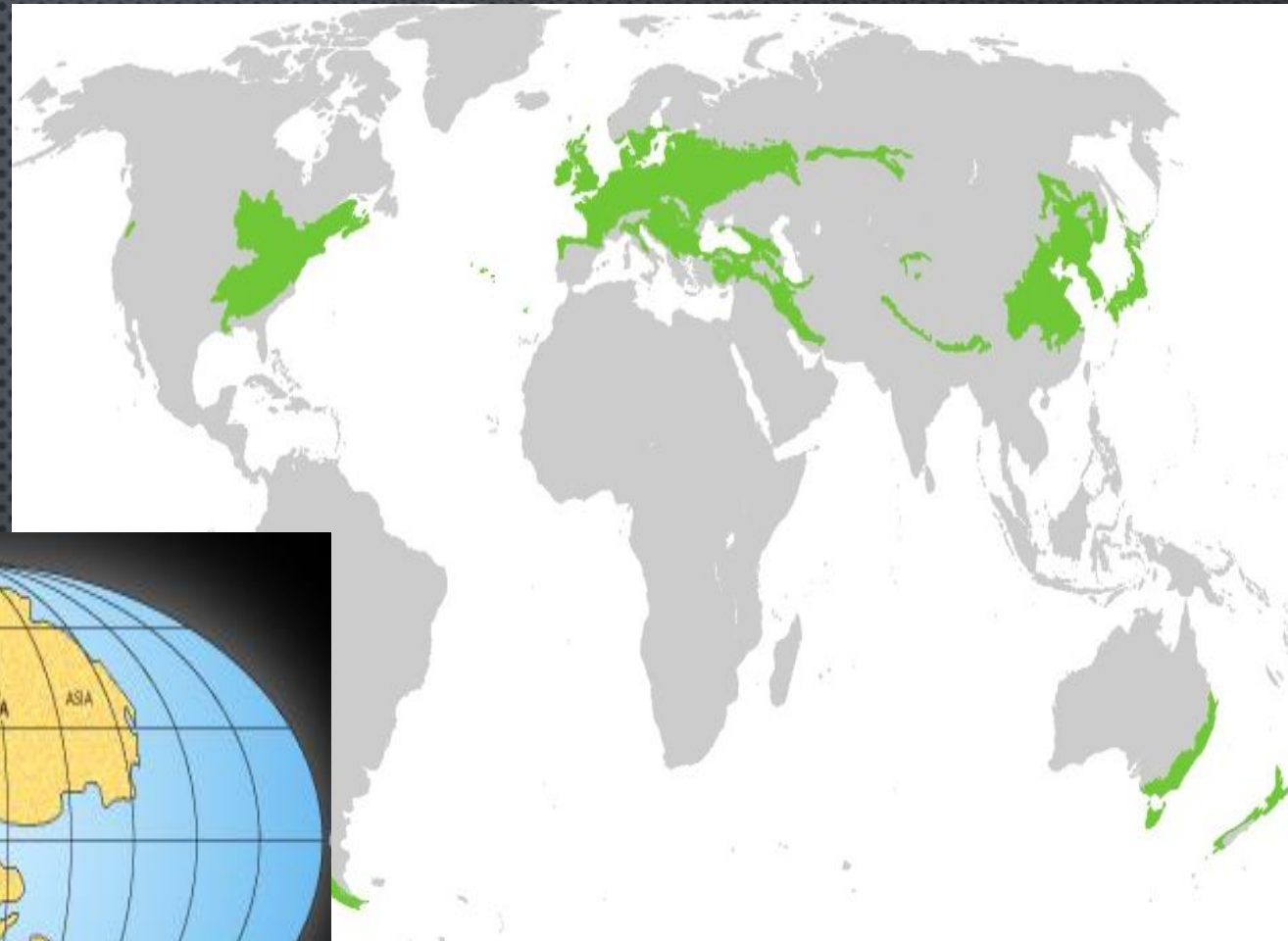
## OVERVIEW

- THE TEMPERATE FOREST BIOME
- WHAT IS AN “EPHEMERAL” PLANT?
- INSECT-EPHEMERAL RELATIONS
- PROBLEMS FACING NATIVE PLANTS
- THE PLANTS



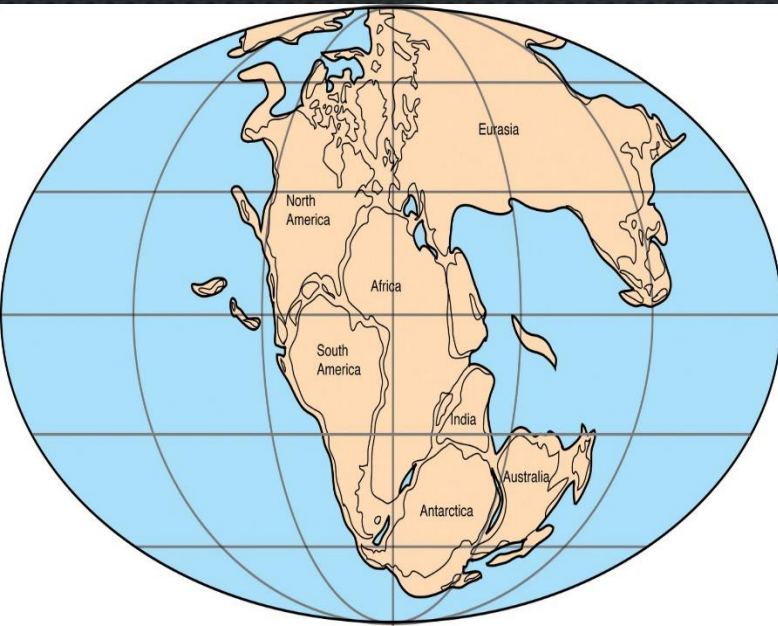
# TEMPERATE FOREST BIOME

Temperate forests are a living legacy of survival throughout the changes of earth history



Present distribution of Temperate Forest Biome

Earth ~300 mya



Earth ~ 200 mya



# HISTORY OF TEMPERATE FORESTS

## How did they form?

- During Pangea, circa 300 mya, a forest covered the Northern Hemisphere.
- As Pangea broke and separated, so too did this forest community.

## Results:

- Temperate forests share many closely related species and are long lost relatives.
- Consequently, many European and Asian perennial plants do well here because of their adaptations to the land and climate.
- These foreign species are frequently the ones that escape cultivation and become problems for our North American ecosystems.

Sharp-lobed Hepatica  
*Hepatica nobilis acuta*



# WHAT IS AN EPHEMERAL PLANT?

**Ephemeral** – lasting for a brief period of time

- **DESERT EPHEMERALS** – PLANTS ADAPTED TO TAKE ADVANTAGE OF THE VERY SHORT FAVORABLE SEASONS IN DESERTS.
- **DISTURBANCE EPHEMERALS** – PLANTS THAT COLONIZE DISTURBED SOILS AND WHOSE LIFE CYCLE IS ACCOMPLISHED IN ONE SEASON OR LESS.
- **SPRING EPHEMERALS** – PLANTS THAT EMERGE QUICKLY IN THE SPRING AND DIE BACK AFTER A SHORT GROWTH AND REPRODUCTION PHASE.

Wood Anemone  
*Anemone quinquefolia*



# RESOURCE PARTITIONING

- ORGANISMS WITH SIMILAR NEEDS FIND WAYS TO LIVE TOGETHER BY SHARING THE SAME RESOURCE.
- THIS COULD MEAN DIFFERING BLOOM TIMES TO ATTRACT THE SAME SPECIES OF BEE, OR MAYBE DIFFERENT ROOT STRATEGIES TO REDUCE COMPETITION WITH NEIGHBORS.
- SPRING EPHEMERAL FLOWERS TAKE ADVANTAGE OF THE EARLY SUNLIGHT (THE RESOURCE) OF SPRING BEFORE THE CANOPY SHADES THEM OUT.



# INSECT-EPHEMERAL RELATIONS

- NATIVE FLOWERS ADAPTED MANY POLLINATION STRATEGIES WITH NATIVE INSECTS.
- SOME FLOWERS REQUIRE SPECIAL ABILITIES TO POLLINATE WHILE OTHERS CAN ONLY BE ACCESSED BY SPECIALIST POLLINATORS.
- SOME EPHEMERALS WILL ONLY PRODUCE POLLEN, IMPORTANT FOR THE DEVELOPMENT OF NATIVE BEES.
- SOME EPHEMERALS PRODUCE NECTAR IN SMALL QUANTITIES ENTICING POLLINATORS TO VISIT MANY FLOWERS.



# INSECT-EPHEMERAL RELATIONS

- **SONICATION** - A TECHNIQUE USED BY SOME BEES TO RELEASE POLLEN WHICH IS MORE OR LESS FIRMLY HELD BY THE ANTHERS.
  - ALSO CALLED BUZZ POLLINATION, BECAUSE OF THE LOUD BUZZING SOUNDS CREATED.
  - AS SOUND IS SIMPLY VIBRATIONS OF THE AIR, WE CAN SAY THAT YES, SOME PLANTS DO RESPOND TO SOUND, AND HAVE EVOLVED SPECIAL WAYS TO DO SO.
  - PLANTS IN THE SOLANACEAE FAMILY (TOMATOES, POTATOES, EGGPLANT, NIGHTSHADES ETC.) SHOOTING STAR, PARTRIDGE PEA, AND THE BLUEBERRY FAMILY.
  - ▶ Honeybees, *Apis mellifera*, are not capable of buzz pollination. They will not visit these kinds of plants
  - ▶ There are a number of native bees adapted to this kind of pollination. For this reason it is important to provide habitat and plants for native bees.





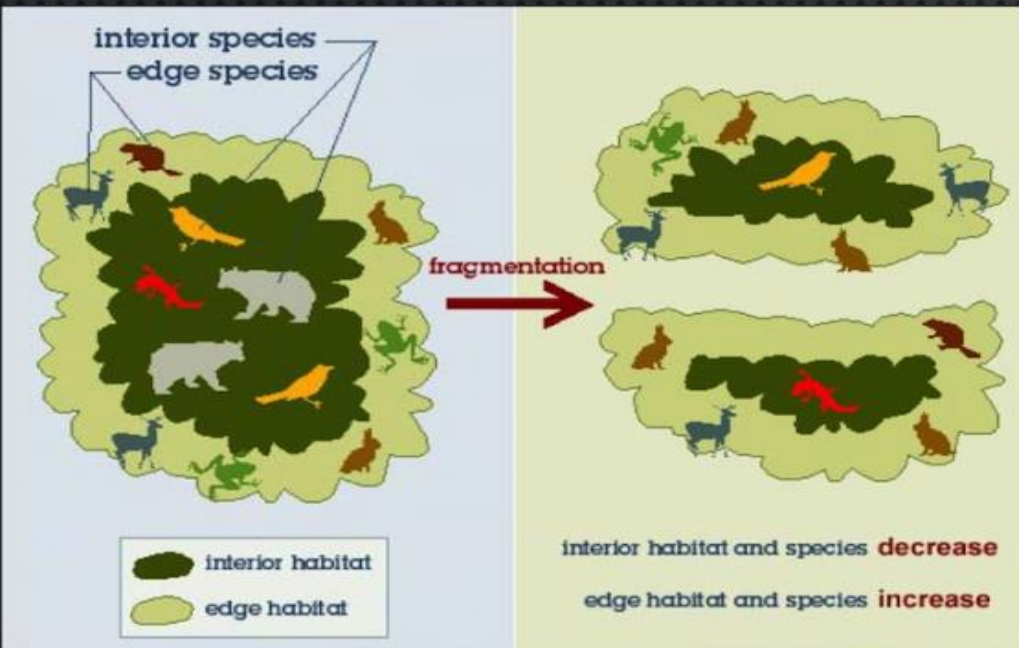
# INSECT-EPHEMERAL RELATIONS

- **MYRMECOCHORY** - GREEK FOR "ANT DANCE"; SEED DISPERSAL VIA ANTS. PLANTS CREATED ELAIOSOMES TO LURE ANTS INTO BRINGING THE SEED AWAY FROM THE PARENT PLANT
- THIS ADAPTATION HAS INDEPENDENTLY APPEARED NUMEROUS TIMES IN THE PAST
- NEARLY 3,000 SPECIES OF PLANTS USE MYRMECOCHORY
- EXAMPLES INCLUDE: BLOODROOT, DUTCHMAN'S BREECHES, *HEPATICA*, SPRING BEAUTY, *TRILLIUM*, TROUT LILY, *VIOLA*, WILD GINGER, TWINLEAF ETC.



# THREATS TO NATIVE EPHEMERALS

- INVASIVE SPECIES - LESSER CELANDINE, AMUR HONEYSUCKLE, GARLIC MUSTARD, WINTER CREEPER, ENGLISH IVY, ETC.
- HABITAT LOSS/FRAGMENTATION
- LOVING TO DEATH (POACHING, PICKING FLOWERS)
- DEER



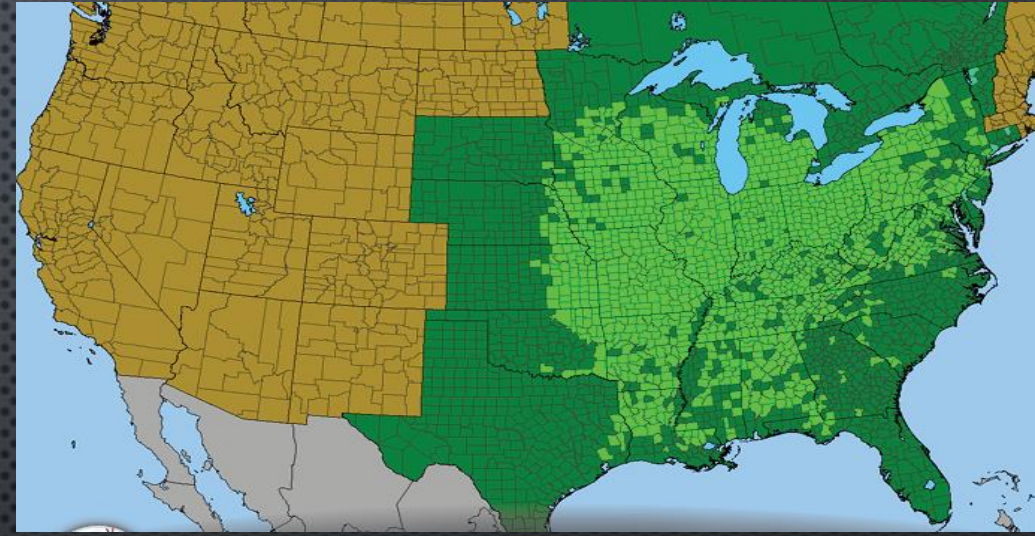
# WOOD PHLOX - *Phlox divaricata*



- Greek “*Phlox*” means “flame.” “divaricate” refers to the plant’s spreading habit.
- Many insects; moths, skippers, flies, long-tongued and short-tongued bees visit *Phlox*.
- *Lepidoptera* are the most effective pollinators.
- Their long tongues access nectar and pollen at the base of the flower; transferring pollen causing pollination.
- *Phlox* requires cross-pollination



# WOOD PHLOX – *Phlox divaricata*



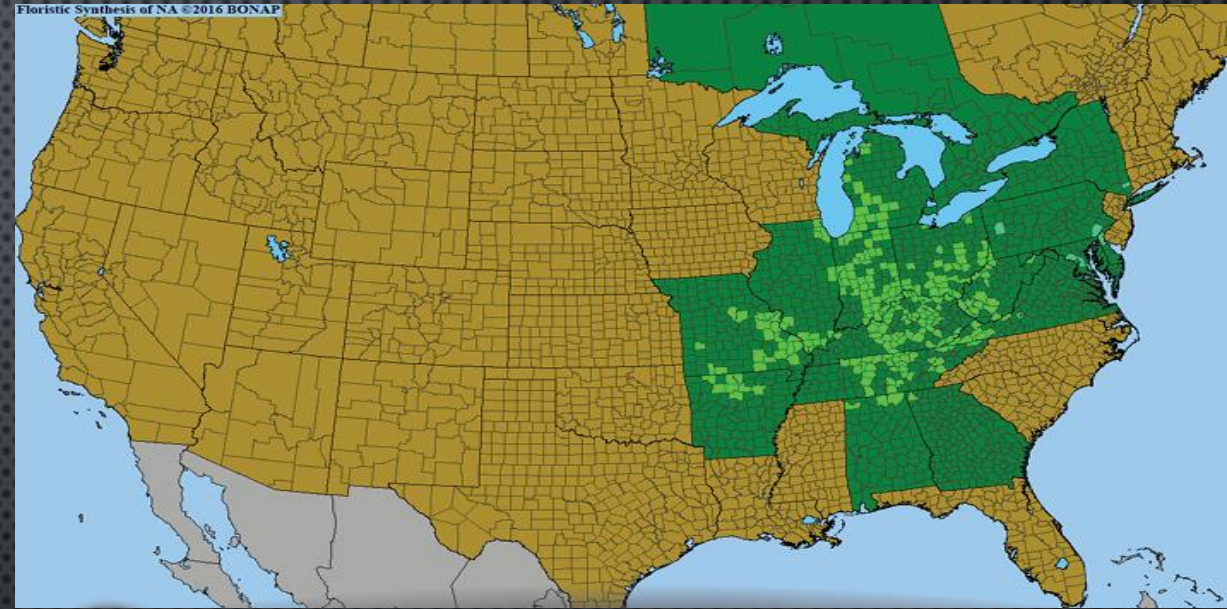
# WOOD POPPY – *Stylophorum diphyllum*



- In the Poppy (*Papaveracea*) family.
- Poppies are known for the chemical attributes of their saps. Wood Poppy's sap is bright yellow and stains.
- This flower produces pollen but no nectar.
- Lobed leaves grow from an underground rhizome, two leaves are apparent below the flower, epithet *diphyllum* means "two leaves".
- With the help of ants, Wood Poppy is a prolific self-seeder.



# WOOD POPPY - *Stylophorum diphyllum*

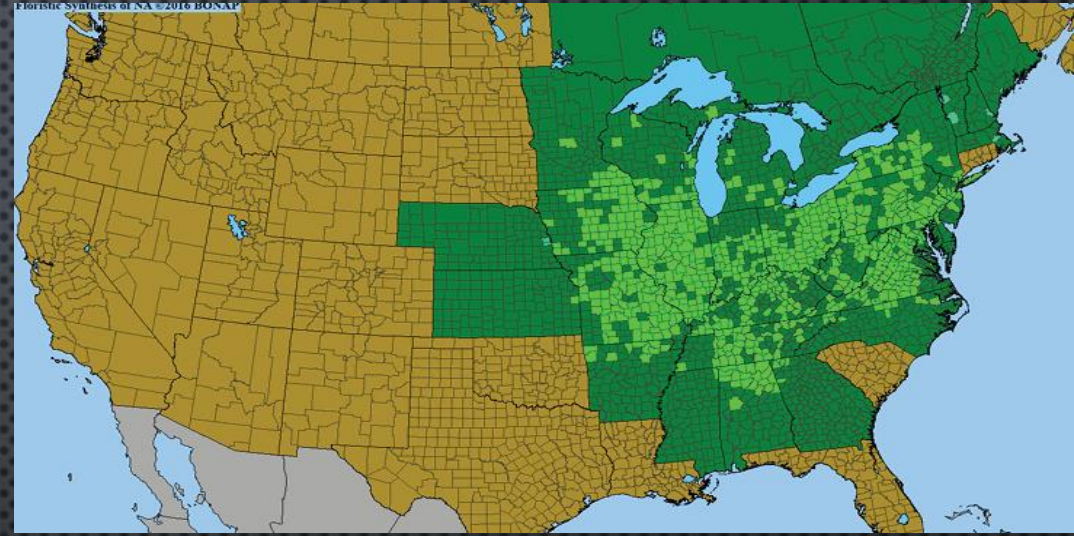


# VIRGINIA BLUEBELLS – *Mertensia virginica*

- ▶ Named after the German botanist Franz Carl Mertens. The epithet refers to the colony Virginia.
- ▶ Flowers are five petals fused into a funnel shape, ideal for hummingbirds and butterflies;
- ▶ In the right place it can colonize whole areas.
- ▶ A frequent victim of picking and poaching.



# VIRGINIA BLUEBELLS - *Mertensia virginica*



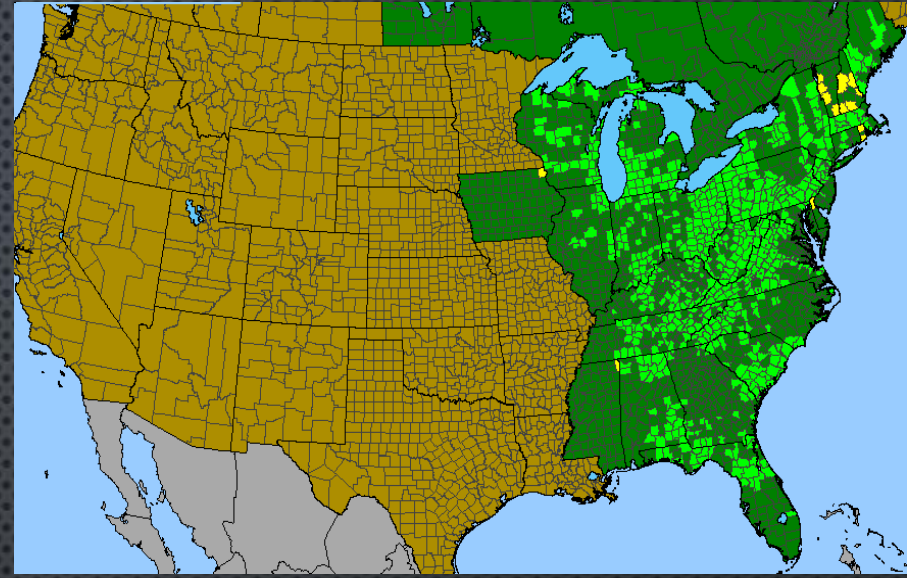


# SQUAW ROOT - *Conopholis americana*

- IN THE OROBANCHACEAE FAMILY, THE BROOMRAPES. FOUR MEMBERS ARE PRESENT IN OHIO
- SQUAW ROOT IS PARASITIC UPON OUR OAK SPECIES
- DOES NOT CONTAIN CHLOROPHYLL, DOES NOT PHOTOSYNTHESIZE AND IS INDIFFERENT TO LIGHT INTENSITIES
- MAJORITY OF PLANT IS UNDERGROUND. WE ONLY SEE THE FLOWERING STEMS, AFTER THE PLANT IS AT LEAST FOUR YEARS OLD
- ABUNDANCE OF SQUAW ROOT IS AN INDICATOR OF OLD GROWTH, OR LONG-TERM, UNDISTURBED, FOREST



# SQUAW ROOT – *Conopholis americana*





Common Blue Violet  
*Viola sororia*

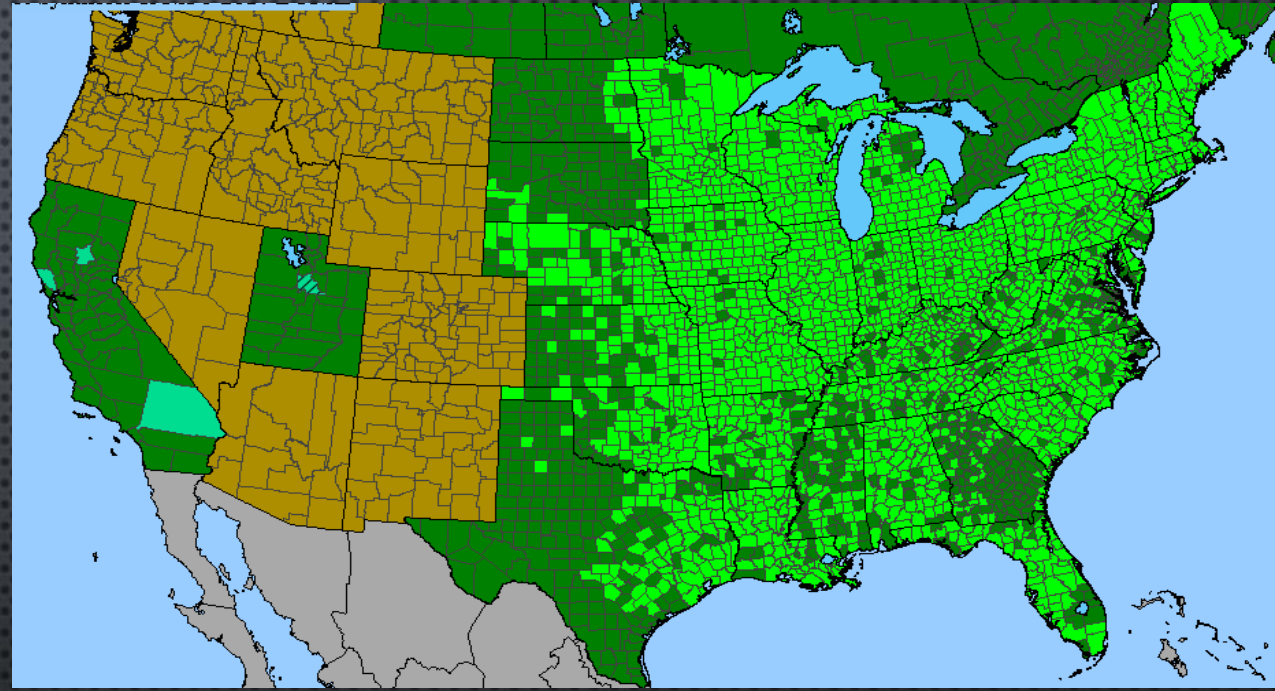
## VIOLETS – *Viola spp.*

- Can be used as a groundcover. A substitute for lawn, especially in shaded areas
- Produces nectar in a nectar spur on the lower petal
- Seeds can shoot out up to 6 feet
- Leaves and flowers are edible



# VIOLETS - *Viola* spp.

Downey Yellow Violet  
*Viola pubescens*

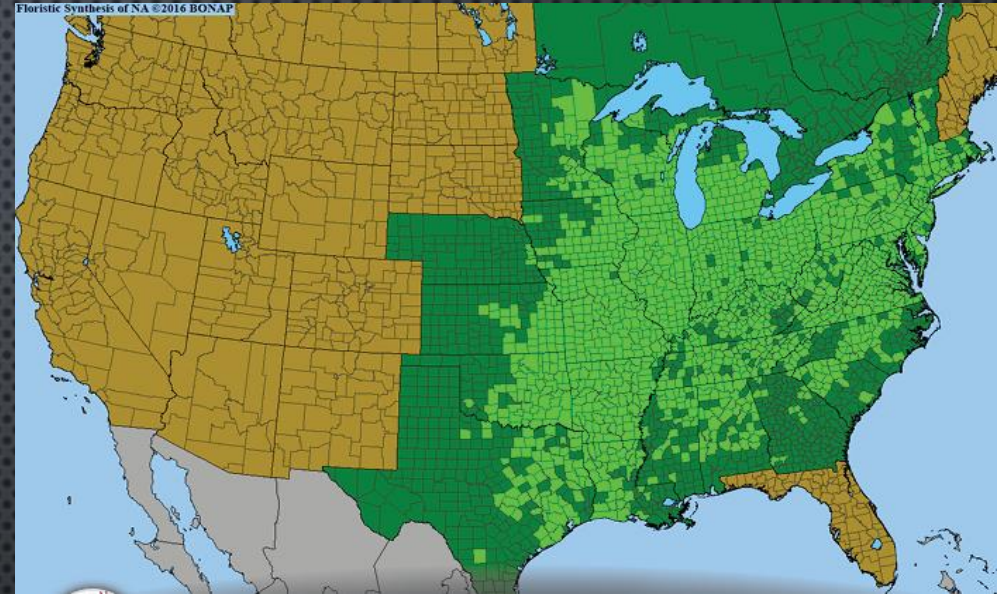


# SPRING BEAUTY - *Claytonia virginica*

- NAMED AFTER VIRGINIA BOTANIST JOHN CLAYTON WHO CREATED THE “FLORA VIRGINICA” (1739), DESCRIBING VIRGINIA’S PLANT LIFE
- THE VARIATION IN COLORS HAVE BEEN A SOURCE OF INTERESTING RESEARCH
- HAS LONG LANCEOLATE, SIMPLE, STRAP-LIKE LEAVES
- THE ENTIRE PLANT IS SAFE FOR HUMAN CONSUMPTION
- BLOOMS FROM MARCH THROUGH APRIL, OCCASIONALLY EARLIER
- THE FLOWERS REFLECT LIGHT AND OPEN WHEN IN SUNLIGHT



# SPRING BEAUTY - *Claytonia virginica*

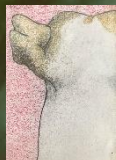
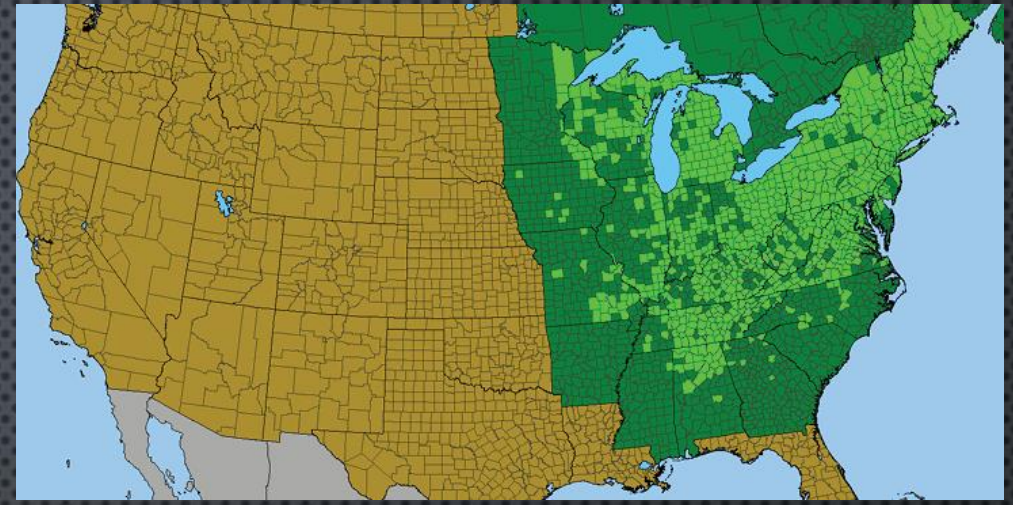


# TROUT LILY - *Erythronium* spp.

- Named for the blotchy appearance of the leaves resembling the pattern of brown trout.
- Also known as Dogtooth Violets because of the shape of their tooth-shaped bulb, but they are not violets.
- A white species, *E. albidum* is very common in Ohio, while the Gold-Star Lily, *E. rostratum*, is endangered in Ohio.
- Young plants bear a single leaf. Mature plants will produce two leaves and one nodding flower.
- Because of their slow maturity rate, large colonies of flowering Trout Lilies are usually very old.



TROUT LILY – *Erythronium* spp.





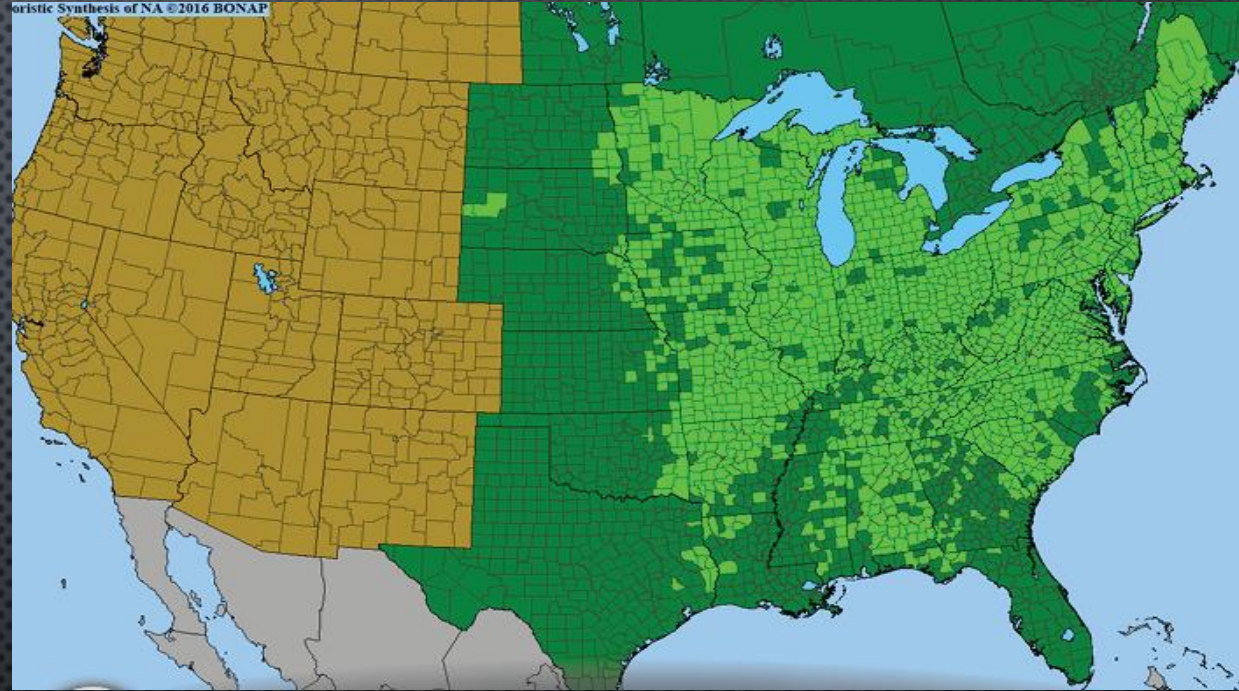
# BLOODROOT - *Sanguinaria canadensis*



- ▶ Latin word *sanguis*, means blood. Damaged, the plant will ooze orange to reddish sap.
- ▶ Sanguinarine, a chemical in the sap, kills skin tissue, causing it to slough off.
- ▶ Single flower forms first, then a single leaf.
- ▶ A member of the *Papaveraceae* family, it's chemical attributes are being investigated for opium-like derivatives and other alkaloids.



# BLOODROOT – *Sanguinaria canadensis*

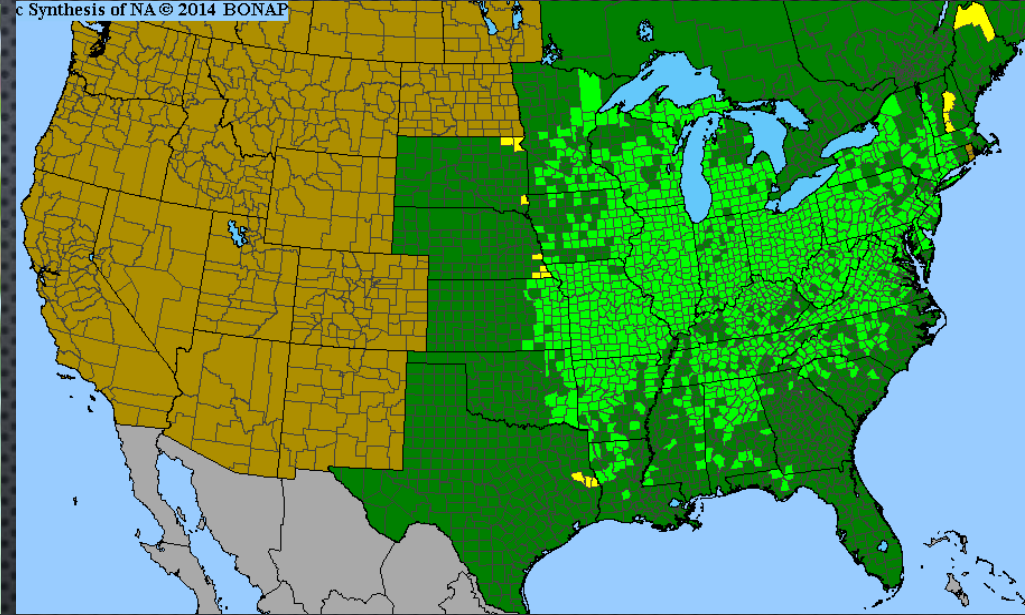


# CUT-LEAF TOOTHWORT – *Cardamine concatenata*

- ▶ The epithet, *concatenata*, is Latin for “joined together” referring to the structure of the roots
- ▶ Named for the tooth looking projections on the stem and the deeply cut leaves.
- ▶ Pollinated by long and short tongued bees, Giant Bee Flies, beetles, flies and butterflies and is also a food source for the White-footed mouse, *Peromyscus leucopus*
- ▶ Host plant for Falcate Orange-tip, West Virginia White and Mustard White Butterflies. Two species of flea beetles also feed on toothwort.



# CUT-LEAF TOOTHWORT – *Cardamine concatenata*

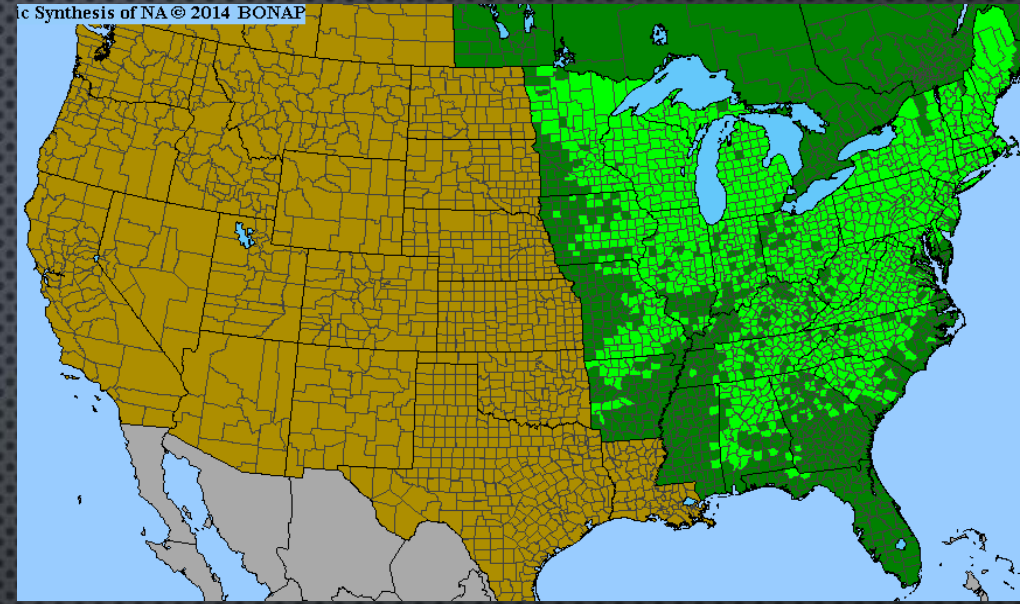


# HEPATICA - *Hepatica nobilis*

- THE NAME REFERS TO THE LEAF SHAPE WHICH RESEMBLES THE LIVER
- BECAUSE OF THE LEAF SHAPE, HEPATICA WAS THOUGHT TO AID IN LIVER AILMENTS
- LEAVES WILL PERSIST THROUGH WINTER UNTIL THE FOLLOWING SPRING
- BOTH SHARP-LEAFED AND ROUND-LEAFED HEPATICA GROW IN OUR REGION
- ENJOYS CLAY SOILS BENEATH BEECH AND OAK CANOPIES.



# HEPATICA – *Hepatica nobilis*

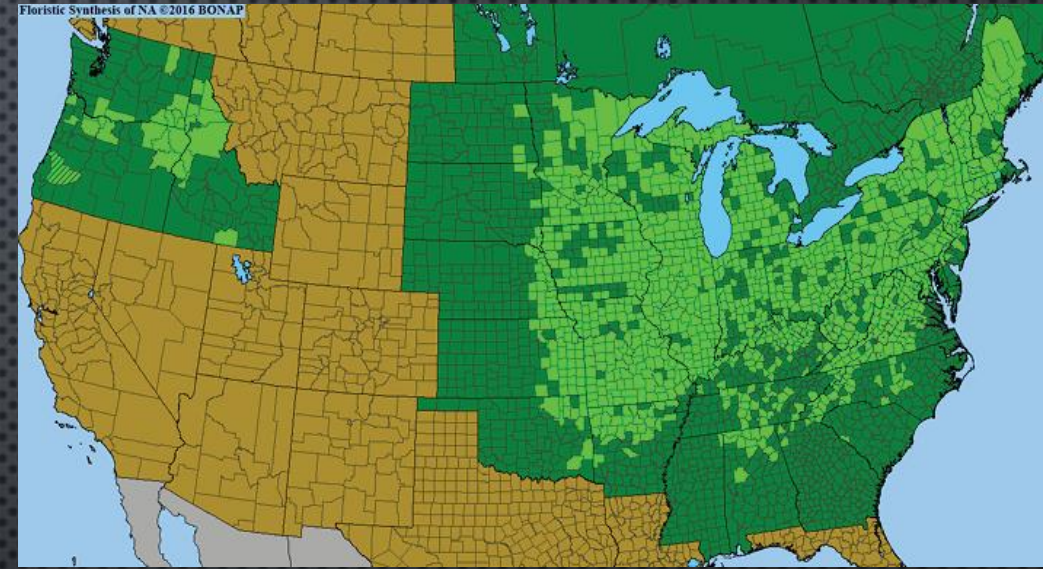


# DUTCHMAN'S BREECHES - *Dicentra cucullaria*

- NAMED FOR THE FLOWERS THAT REMINDED SOME OF PANTS BLOWING IN THE WIND
- THE GENUS NAME REFERS TO THE TWO SPURS ON THE FLOWERS: GREEK *DI* - TWO, *KENTRON* - SPIKE
- RELATED TO SQUIRREL CORN (*DICENTRA CANADENSIS*) AND THE ASIAN BLEEDING HEARTS (*LAMPROCAPNOS SPECTABILIS*)
- DORMANT CLUSTERS OF REDDISH, PINK OR WHITE CORMS CAN BE SEEN IN EARLY SPRING
- DEPENDENT ON BUMBLEBEES, *BOMBUS SPP.* FOR CROSS POLLINATION. THEY ARE SPECIALLY ADAPTED TO OPENING THE PETALS OF THIS FLOWER



# DUTCHMAN'S BREECHES – *Dicentra cucullaria*





# SQUIRREL CORN - *Dicentra canadensis*



- ▶ Closely related Dutchman's Breeches, *Dicentra cucullaria*.
- ▶ Squirrel Corn has pinkish hues and rounded spikes. Dutchman's Breeches has hints of yellow and pointed spurs. Rarer than Dutchman's Breeches.
- ▶ The name refers to the small whitish-yellowish bulbets that sit at ground level, they look similar to corn kernels.
- ▶ Pollination is accomplished by bumblebees, seeds have eliasomes and are spread by ants.
- ▶ The foliage is toxic and avoided by herbivores.



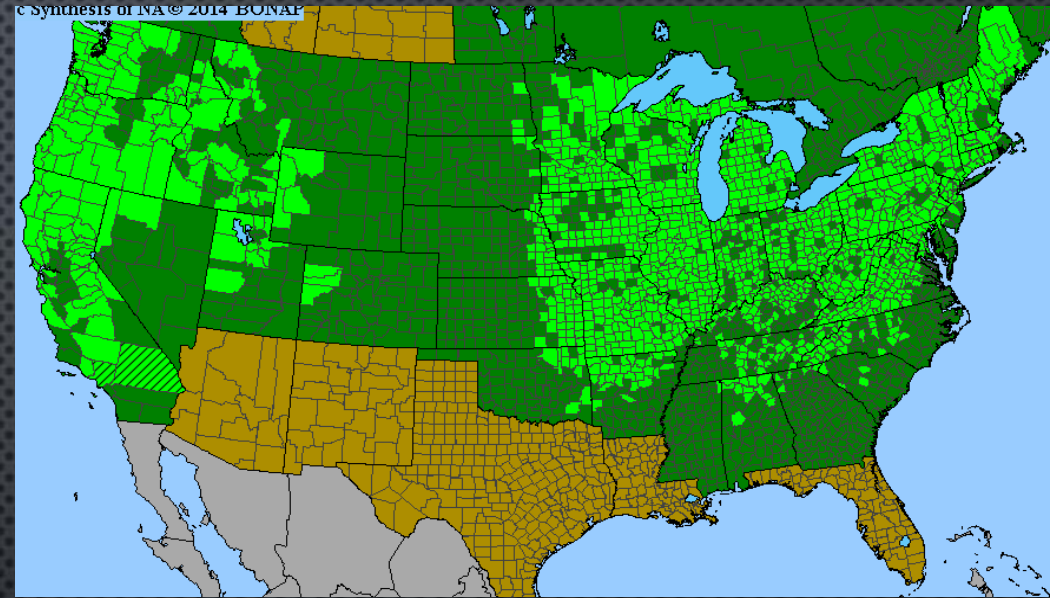
# SQUIRREL CORN – *Dicentra canadensis*



Dutchman's Breeches



Squirrel Corn

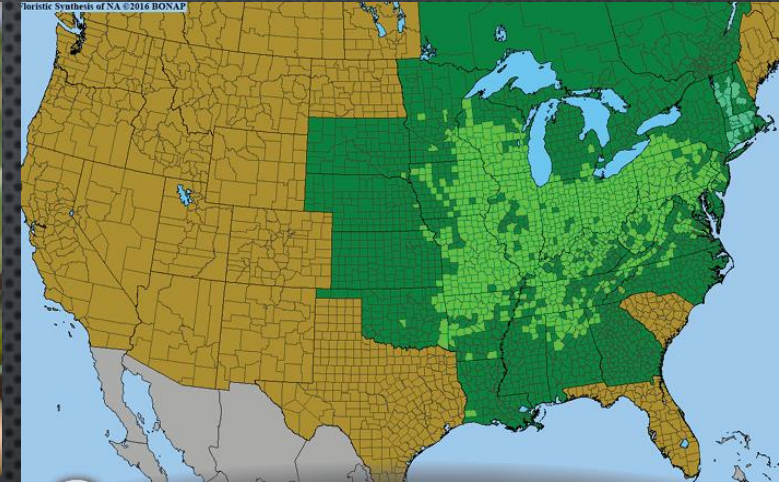


# JACOB'S LADDER – *Polemonium reptans*

- Leaflets are oppositely arranged, reminiscent of the Biblical story of Jacob's Ladder to Heaven.
- The roots have been used by Native Americans for a variety of ailments, from bronchitis to snakebites.
- The larvae of a native bee, *Adrena polemonii*, require *Polemonium* pollen.



# JACOB'S LADDER - *Polemonium reptans*



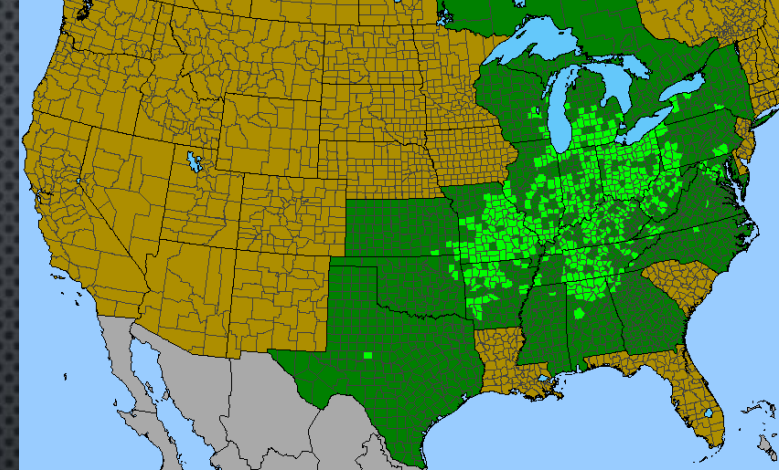
# HARBINGER OF SPRING - *Erigenia bulbosa*



- ONE OF THE FIRST OF THE SPRING EPHEMERALS TO BLOOM
- EASILY OVERLOOKED, BUT VERY PRETTY
- THE ENTIRE PLANT IS EDIBLE
- PRODUCES NECTAR THAT ONLY CONTAINS FRUCTOSE
- FLOWERS PRODUCE A SMALL AMOUNT OF NECTAR, BUT WHEN GROUPED TOGETHER CREATE A POSITIVE INCENTIVE FOR POLLINATORS TO VISIT MANY
- MOSTLY POLLINATED BY NATIVE, SOLITARY BEES. THESE BEES WAKE UP AT LOWER TEMPERATURES THAN HONEYBEES; EARLY SPRING FLOWERS PROVIDE IMPORTANT FOOD SOURCES FOR OUR NATIVE BEES



# HARBINGER OF SPRING - *Erigenia bulbosa*

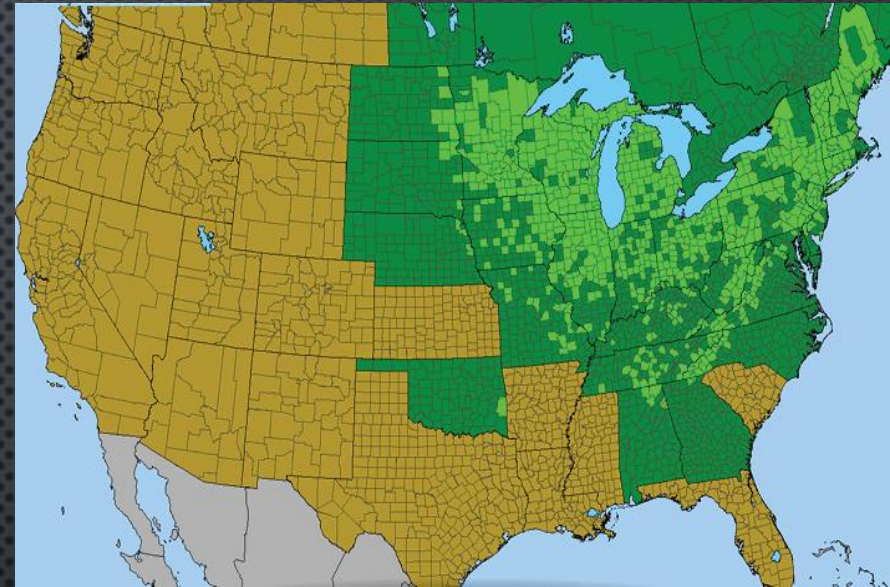


# LEEKS OR RAMPS - *Allium tricoccum*

- Wild relative to culinary leeks, or ramps, They are delicious, if you like that kind of flavor
- The leaves show first. They are vivid green and form large green swaths on the forest floor in spring.
- Animals do not like *Allium* flavors; sulfur compounds deter herbivores but give them their “onion” flavor.
- Flowers are borne on an upright stem, and mature to small, round, black, shiny seeds.



# LEEK OR RAMPS – *Allium tricoccum*





# TRILLIUM Spp.

- THE NAME REFERS TO THE THREE PETALS, SEPALS, AND BRACTS.
- IN SOME REGIONS THEY ARE CALLED “WAKE-ROBINS” FOR THEIR ARRIVAL BEFORE ROBINS.
- OHIO ORIGINALLY HAD 8 SPECIES OF *TRILLIUM* NATIVE TO ITS SOILS
- DEER RELISH *TRILLIUM* AND POSE A SERIOUS THREAT TO THEM.
- OHIO REVISED CODE, GENERAL PROVISIONS, CHAPTER 5, SECTION 5.021 NAMES THE WHITE TRILLIUM AS THE OFFICIAL OHIO STATE WILDFLOWER.



Nodding Trillium - *Trillium flexipes*



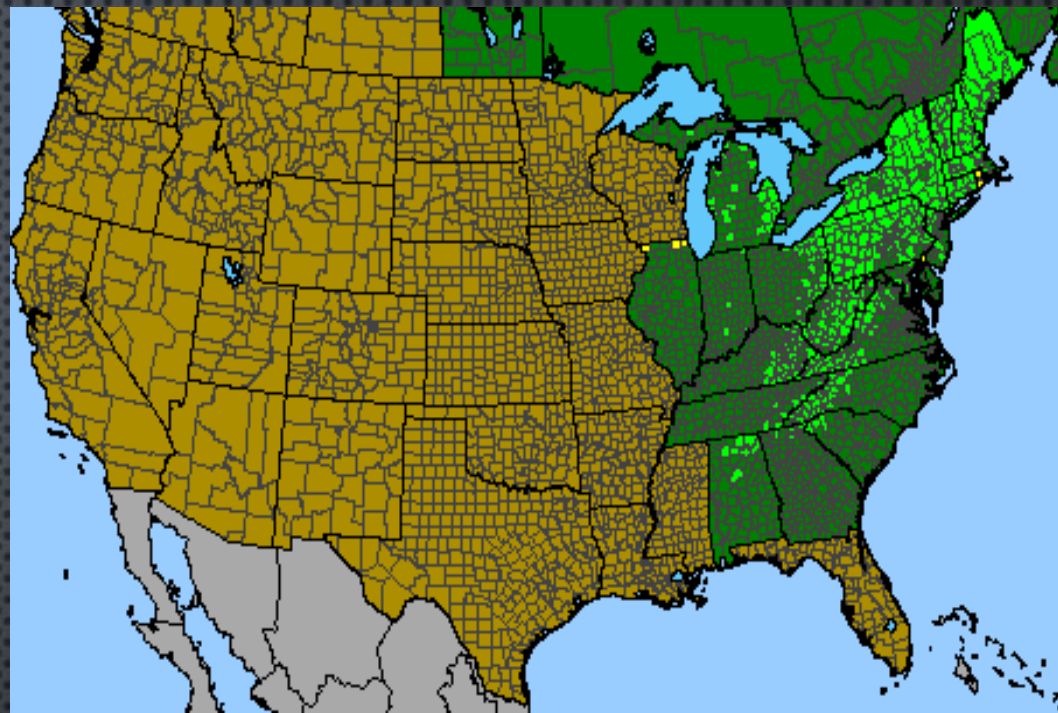
# TRILLIUM Spp.



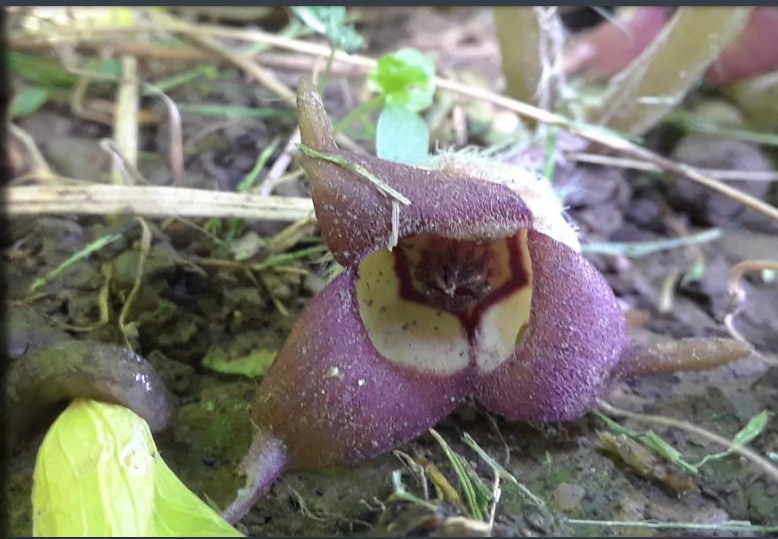
Toadshade Trillium *Trillium sessile*



Snow Trillium – *Trillium nivale*



White Trillium – *Trillium grandiflorum*

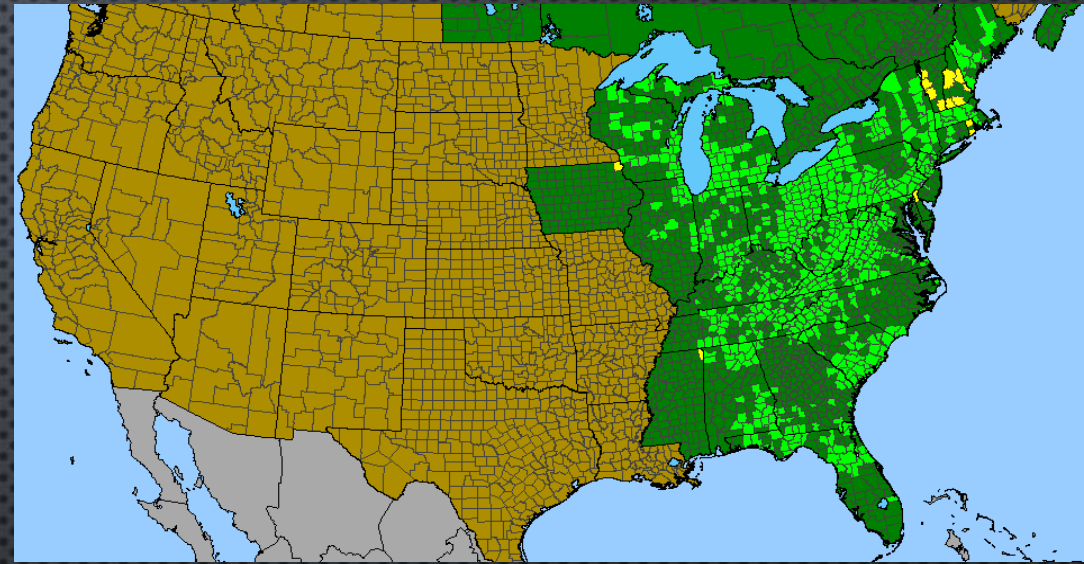


## WILD GINGER – *Asarum canadense*

- NOT RELATED TO CULINARY GINGER; THE ROOTS HAVE A SIMILAR FRAGRANCE
- CONTAINS ARISTOLOCHIC ACID, A CARCINOGEN, IT SHOULD NOT BE CONSUMED
- SINGLE FLOWER IS INCONSPICUOUS AND LIES FLAT ON THE GROUND, BUT BEAUTIFUL UPON INSPECTION
- POLLINATION IS ACCOMPLISHED VIA BEETLES, ANTS, FLIES AND EVEN SLUGS
- AN EXCELLENT NATIVE GROUNDCOVER, ESPECIALLY IN DIFFICULT, DEEP TO LIGHT SHADY AREAS



# WILD GINGER - *Asarum canadense*

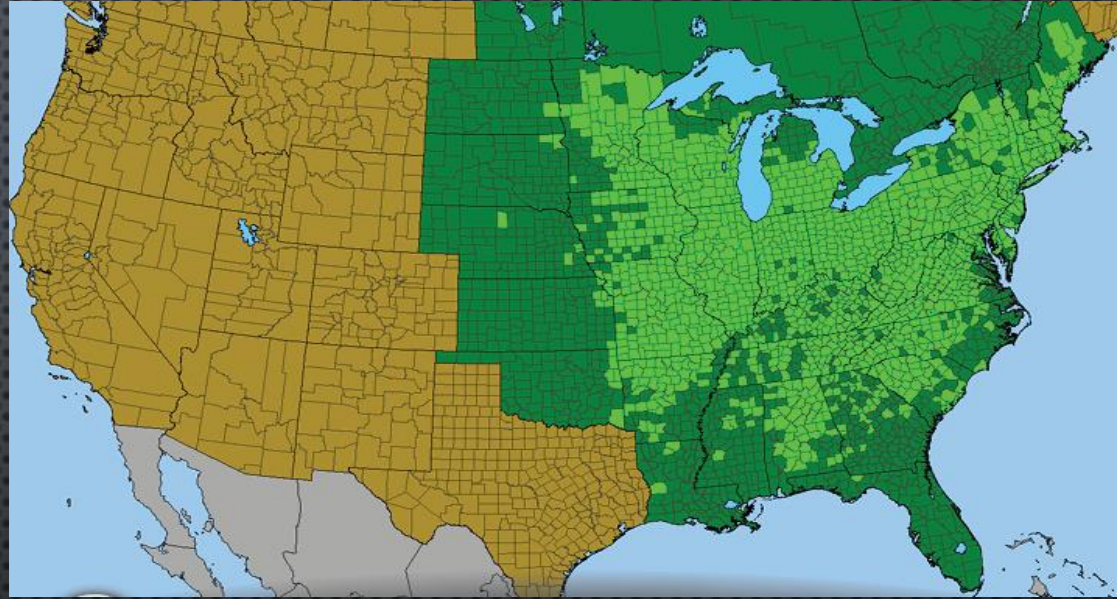


# WILD GERANIUM – *Geranium maculatum*

- ▶ Not the garden annual *Pelargonium*, confusingly called Geranium
- ▶ The name Cranesbill and the family name *Geraniaceae*, deal with the pointed, bill shaped seedheads in many species
- ▶ The seedheads are composed of five long-tailed, comma shaped compartments each holding one seed and attached to a central spike by the tail ends
- ▶ As the seedheads dry, tension builds in the “tail” section. With a fast, curling action, the seed flings away



# WILD GERANIUM - *Geranium maculatum*

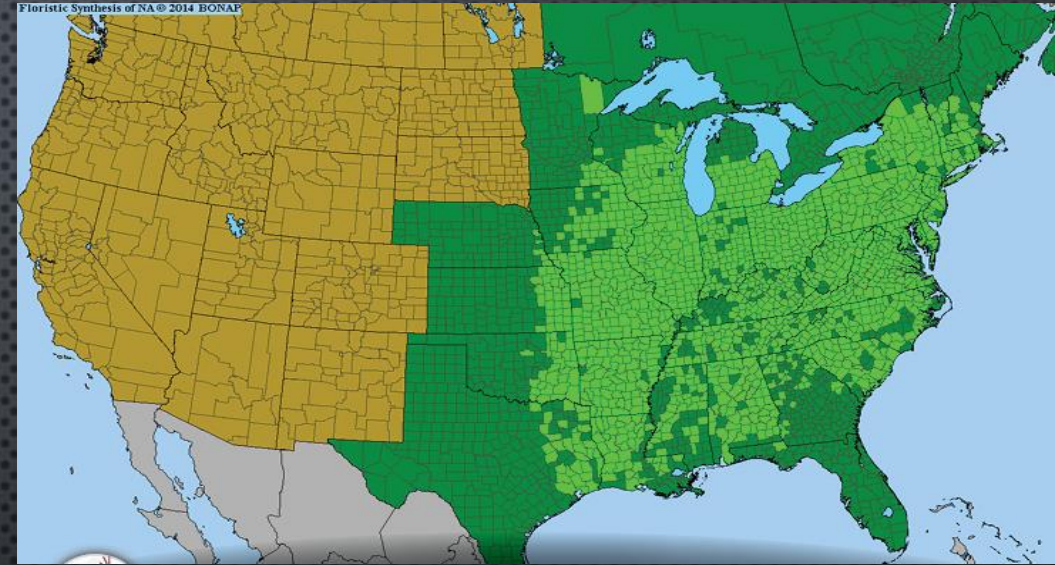


# MAYAPPLE - *PODOPHYLLUM PELTATUM*

- ▶ Grows from a tough rhizome; if undisturbed a large colony can form.
- ▶ Flowering stems will branch into two umbrella-shaped leaves. Non-flowering stems are unbranching with only one leafy top.
- ▶ Large, single white flower in May. The fruit develops in mid summer.
- ▶ All parts of the plant are allegedly harmful to ingest.
- ▶ Extracts from the plant have been use as a topical for skin ailments such as plantar warts.
- ▶ Sometimes leaves are spotted yellow or orange from a fungal rust infection, *Allodus podophyllin*



# MAY APPLE - *Podophyllum peltatum*





# RESOURCES

- AUDUBON SOCIETY'S NATIVE PLANT DATABASE

[HTTPS://WWW.AUDUBON.ORG/NATIVE-PLANTS](https://www.audubon.org/native-plants)

- OHIO NATIVE PLANT LIST

[HTTPS://WWW.OHIONATIVEPLANTMONTH.ORG/](https://www.ohionativeplantmonth.org/)

- OHIO NATIVE PLANT SOURCES

[HTTPS://WWW.OHIONATIVEPLANTMONTH.ORG/NATIVE-PLANT-SOURCES](https://www.ohionativeplantmonth.org/native-plant-sources)

- DOUG TALLAMY: BRINGING NATURE HOME: HOW YOU CAN SUSTAIN WILDLIFE WITH NATIVE PLANTS

NATURE'S BEST HOPE: A NEW APPROACH TO CONSERVATION THAT STARTS IN YOUR YARD

NATURE OF OAKS





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[natureguys.org](http://natureguys.org)

THANK YOU!