

## Who Lives Underground?

Lots of animals can live underground, but they use their time underground very differently. A mother fox digs out a hole to provide a safe haven to raise her young and a warm shelter for the winter. Some salamanders, like the spotted salamander or marble salamander, may spend most of their lives



below the surface, only coming up once a year to reproduce in a vernal pool. Cicadas, on the other hand can spend as many as 17 years underground eating nothing but sap from tree roots.



## The Other Half of Plants

There is a lot more to plants than just the above ground parts we can see – they grow roots and tubers below ground too! Plants send out two types of roots: tap roots extend way down (the world record is almost 400 feet!), and lateral roots grow side to side. Both help keep the soil in place while



providing nutrients and water to the plant. Usually, more than half of a plant is growing out of sight beneath the soil surface.

Plants need the underground world for their seeds too. The contact with the soil gives buried seeds a better chance of germinating and developing into new plants. Some seeds are so specific that they will only germinate in certain types of soil, like alluvial or dibase. This soil-specificity can make relocating native plants a challenge.

Some trees, like the native Black Walnut or the non-native Tree of Heaven, actually give off chemicals from their roots which prevent seeds from germinating or roots from growing. This process is called allelopathy and is just one way of the many ways that chemicals in the soil can affect our environment.

## The Little Bits You Can't See

Most living things in the soil are very, very, very small. About a billion bacteria and fungus too tiny to be seen by the human eye inhabit just a teaspoon of soil! A type of fungus called mycorrhizae acts with plant roots to help deliver water and nutrients for growth. Some mycorrhizae can even allow chemicals to flow from one plant to another. Mycorrhizae are very helpful for orchids – in fact, orchids cannot grow without their species of mycorrhizae. All these little bits, the bacteria and fungus, can be important to forest health.

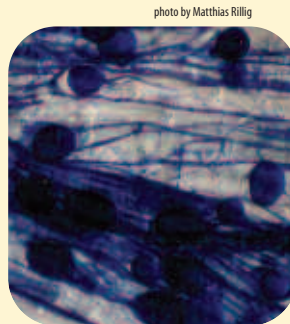
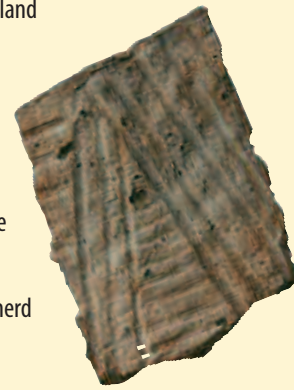


photo by Matthias Rillig  
*Mycorrhizae as viewed under a microscope with blue dye added for contrast.*

*The world is mud-luscious and puddle-wonderful.*  
e.e. cummings

## Evidence of Our Past

Stone tools and potsherds (pieces of broken pottery) are only some of the prehistoric American Indian relics you may find underground. These artifacts signal that humans were on this land hundreds or thousands of years ago. People who lived here during the last 400 years, after the American Indians moved away, also left artifacts and other evidence in the ground. Imagine what might have happened in ages past so that a potsherd may be discovered today.



## If not you, who? Small things.

**Think mulch.** Yard waste can easily damage the forest soil. Mulch grass clippings while you mow your yard – less clean up and less waste! Other yard waste can be set at the curb and picked up as part of the county's yard waste recycling program.

**Preserve the past.** If you find an artifact or remnants of an old foundation, please leave it be for others to see. By leaving the artifacts in place, archaeologists can get a more complete picture of our history.

## If not you, who? Big things.

**Plant native species in your yard.** Native trees and shrubs are best adapted to the types of soils that we have in Fairfax County and are best able to protect the soil chemistry.

## The Dirt on Soil



What is going on beneath our feet? You may be standing on grass or a sidewalk right now - but what is under that? Sometimes we forget that the soil is part of our natural world – however, when we think about it we can come in contact with lots of things that are in the ground – like wildlife, plant roots and rocks! The underground world is full of other things too like fossils, artifacts, fungus, or maybe even a cave. The ground is a lot more than just a place to walk on; there is a whole world under there.

*Out of sight, out of mind. There's a rich, active world thriving beneath our feet.*

Soil is very special stuff. It can take hundreds of thousands of years to make good soil! But how is soil created? Weathering rock and decaying organic matter break into smaller and smaller bits with the help of wind, rain and wildlife, especially worms, until finally soil is formed. Layers of leaves and needles found in forests help protect the soil.



*A cross section view of the soil at a stream bank shows a rainbow of layers composed of different organic and mineral materials deposited over time.*



## Care, Educate, Inspire

Stewardship is about working together to care for the environmental and cultural resources of Fairfax County. People become stewards for different reasons. They may want to help ensure clean water and air. They may wish to share something with their children. They may be inspired by spiritual beliefs. Whatever prompts our commitment, it is easy to take an active role in stewardship. It can be a small and simple thing, or it can be much bigger. Either way, it all adds up to a Fairfax County that looks to its past with pride and to its future with confidence.

You can learn more about Fairfax County Stewardship, the Board of Supervisors' 20-year environmental vision and the Fairfax County Park Authority at [www.fairfaxcounty.gov/parks/stewardship](http://www.fairfaxcounty.gov/parks/stewardship) or call 703-324-8674



If accommodations or alternative formats are needed, please call 703-324-8563. TTY 703-803-3354.



# Fairfax County Stewardship

# Underground World



Fox Pups

Mushrooms



photo by Kevin Munroe and Tony Robison



Millipede



Artifacts

Immature Cicada



Forestry Archive, Pennsylvania Department of Conservation and Natural Resources, Bugwood.org



Arrowhead



Root Vegetables

Salamander



photo by John White



Historic Foundations

Red Ant



photo by Joseph Berger, Bugwood.org

photo by Hal Korber



Woodchuck



Roots

Belted Kingfisher



copyright John D. Tubbs, www.tubbsphoto.com

photo by Greg Sykes



Indian Pipe

Earthworm



photo by Greg Sykes



Eastern Cottontail Rabbit