

Birds of the HEEP



Alan D. Wilson

Red-winged Blackbird (*Agelaius phoeniceus*)

Males of this species have a red patch on their shoulders, as their name suggests, while females are brown overall with some streaking. They eat insects and nest in marshes, shrubs, and occasionally trees. Listen for the typical male 'conk-la-ree' song during the spring and summer.



Brendan Lally

Great Horned Owl (*Bubo virginianus*)

These owls can be found in many different types of forests across North America. They prey on a wide variety of organisms including rodents, raptors, and even other owls. American Crows are known to mob Great Horned Owls because the Crows know that these owls are deadly predators.



Matt Tillett

Common Yellowthroat (*Geothlepis thrichas*)

A small migratory songbird, the yellowthroat is often seen hopping through brush, cattails, and other vegetation around wetlands. Males have a distinctive black mask, olive back, and yellow throat while females have brown backs and yellow throat as well. Nest sites are in plants low to the ground but they must be high enough to avoid flooding if by a marsh.



Mark Theriot

Tree Swallow (*Tachycineta bicolor*)

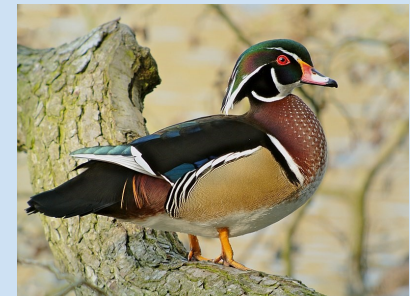
These swallows have plain white undersides and beautiful iridescent blue-green backs. They catch insects, which are their main source of food, while flying in the air. Tree swallows tend to nest in old woodpecker cavities or nest boxes around bodies of water where there are many insects to catch.



Kenneth Cole Schneider

Swamp Sparrow (*Melospiza georgiana*)

As the name suggests, these small songbirds live in swamps as well as other wetland areas. Some defining characteristics are the white throat, reddish-brown wings, and brown sides. They can sometimes be seen sticking their heads under water to catch aquatic invertebrates which are one of their main food sources.



Frank Vassen

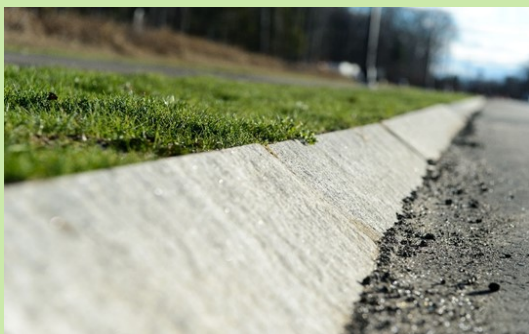
Wood Duck (*Aix sponsa*)

Male Wood Ducks are unmistakable with their incredible feather colors and patterns. Females are light brown overall with a light gray head and blue wing patch. They nest near water in tree cavities from which branches have fallen and are also known to often use nest boxes. Their diet consists of different insects, seeds, and various plants.

Making Roadways Safe for Wildlife

This extension of Discovery Drive eased the flow of human traffic in and out of UConn. However, it threatened to block the daily and seasonal migration of wild animals – from salamanders to deer – through the forest and wetlands where the road was constructed.

To protect the animals, a number of innovations were added to the new road:



UConn Mediashare

Cape Cod Curbing

This form of curb is angled to allow for small animals that get stuck on the road – such as salamanders, frogs, and turtles – to climb out safely.



Ben Breslau

Directed Streetlights

Unlike conventional streetlights, which illuminate the entire area around them, these LED lights focus only on the road to avoid disturbing animals nearby.



UConn Mediashare

Wildlife Underpasses

These are the most important elements of this wildlife-safe roadway. All three bridges provide enough space for even large animals such as coyotes, deer, and bobcats to cross under the road. There are also small barriers to guide small amphibians to the underpasses and away from the road. Bridges and underpasses for wild animals are becoming increasingly popular worldwide. They minimize risks for both wildlife and human drivers, and also reduce the impacts of habitat fragmentation that would hinder the long-term survival of these animals.



UConn Mediashare

Reduced Salt Zone

Road salt can be very harmful to soil and waterways, and to the plants and animals that depend on them. UConn minimizes this potential damage by reducing the amount of salt applied in this area during the winter.



UConn Mediashare

Hats worn by the road's construction crew helped to promote amphibian conservation.

Mammals of the HEEP



Keith and Kasia

Long-tailed Weasel (*Mustela frenata*)

These small carnivores are common across the country. Their slender bodies allow them to prey on small mammals and other animals. They can hunt in burrows, tree cavities, and even snow tunnels. Weasels must feed constantly to maintain their high metabolisms, but can save energy by entering a state of dormancy (torpor).



Creative Commons

Eastern Coyote (*Canis latrans*)

Coyotes migrated into Connecticut in the 1950s, from their native homes out west. Through hybridization with Canadian wolves and domestic dogs, eastern coyotes have become larger and more robust than their western relatives. These coyotes are superbly adapted to many habitats, from forests and farms to suburbs, and even cities like New York.



US Fish and Wildlife

Virginia Opossum (*Didelphis virginiana*)

The opossum is the only species of marsupial in North America. Like kangaroos and other distant relatives, baby opossums finish developing in their mother's pouch. Originally from the southeastern US, opossums migrated north in the early 1900s. They have since adapted to a wide range of habitats, with preference to forests near bodies of water.



Creative Commons

White-tailed Deer (*Odocoileus virginianus*)

Connecticut is home to over 100,000 deer, a massive rebound from just a century ago when they were nearly exterminated in the state. They are well adapted to living between forests and cleared land. They are commonly seen in small herds, and are often active at dawn and dusk. These animals are named for their flag-like tails, which they flash in the presence of danger.



Randolph Femmer

Raccoon (*Procyon lotor*)

The raccoon is famous for its adaptability. They usually live near wooded lakes and streams, but can be found in agricultural and urban areas. Dexterous front paws and an omnivorous diet allow these animals to eat everything from fruits and nuts to small animals to garbage.



Creative Commons

Bobcat (*Lynx rufus*)

Bobcats are medium-sized predators, hunting everything from small birds and mammals to young or sick deer. These elusive animals are mostly solitary and nocturnal, and they prefer habitat with lots of undergrowth and rocks for hiding. They can be identified by their distinct ear tufts with white patches and their short tail.

Reptiles and Amphibians of the HEEP



Kurt Schwenk

Red-backed Salamander (*Plethodon cinereus*)

These salamanders may have a red stripe on their back, or have a uniform gray “leadback” pattern. They live and breed under logs and stones throughout the forest. In spite of their terrestrial lifestyle, red-backed salamanders are lungless and absorb oxygen through their skin.



Jack Phillips

Northern Water Snake (*Nerodia sipedon*)

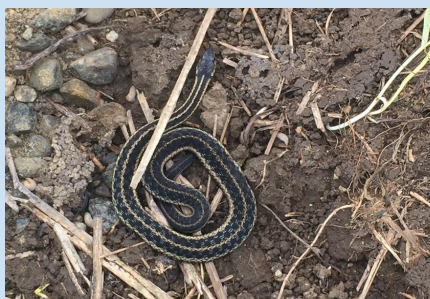
A strong swimmer, this snake lives in and around wetlands, ponds, and streams. They are distinguished by the dark red crossbands on their backs, although they can be all black. Northern water snakes and their relatives give birth to live young. They show no maternal care, so the newborns are independent from their mothers.



Kurt Schwenk

Wood Frog (*Rana* or *Lithobates sylvatica*)

These frogs are frequently seen hopping around the forest floor and around vernal pools. Although their colors vary, wood frogs are easily identified by the dark mask around their eyes. They are well known for adaptation to colder climates, thanks to a natural antifreeze that their bodies produce.



Ben Breslau

Common Gartersnake (*Thamnophis sirtalis*)

These snakes are found in many habitats, from forests and fields to farms and gardens. They feed on fish, amphibians, earthworms, and other invertebrates. This makes them a beneficial animal to have in gardens, as they hunt animals that could damage crops. In early spring, gartersnakes can be seen in a “breeding ball” as many males pursue few females.



Kurt Schwenk

Gray Tree Frog (*Hyla versicolor*)

As their name suggests, these frogs are at home in the canopy above us. However, they can range in color from mottled or pale grays to green. Tree frogs feed on arboreal insects, and only spend time in water during the breeding season, at which time they congregate in vernal pools.



Matthew Willis

Eastern Painted Turtle (*Chrysemys picta*)

Painted turtles can often be seen basking on rocks and logs near calm water. They are omnivorous, feeding on aquatic plants, invertebrates, and small fish. These turtles can be identified by their yellow-striped necks and bright red patches beneath their shells. Like wood frogs, painted turtles can survive very cold winter temperatures.

Cycles of Nature

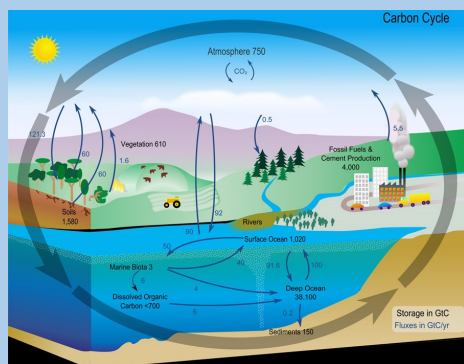
Nature is always changing. Thanks to interactions between living (biotic) and nonliving (abiotic) elements of our world, certain raw materials are constantly cycling between the air, water, soil, and different organisms.

Carbon

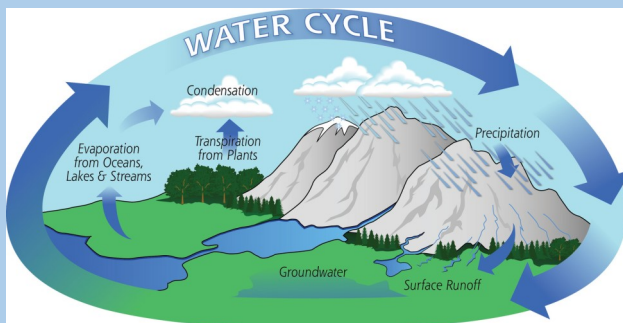
The element of life, carbon is present in our atmosphere as carbon dioxide (CO_2) and methane (CH_4).

CO_2 is consumed and stored by plants, which convert it into sugars using photosynthesis. Animals then ingest the sugars by eating the plants, before releasing the carbon back into the atmosphere via respiration.

Some carbon in dead organisms does not return to the atmosphere, and instead sinks into the ground. Over millions of years, this carbon becomes coal and oil. Humans alter this natural cycle by extracting and burning oil coal and natural gas, which releases fossil carbon to the atmosphere.



NASA



NASA

Water

Water covers about 71% of our planet's surface. Heat from the sun causes some of it to evaporate and rise into the atmosphere as a gas.

When it reaches colder air high in the atmosphere, the gas condenses to form clouds. The clouds accumulate water droplets until they are too heavy to stay airborne. The water then returns to the Earth's surface as precipitation.

On land, surface runoff collects into bodies of water, where living organisms can consume it.

Some water collects in underground aquifers, where it may remain for thousands or even millions of years.

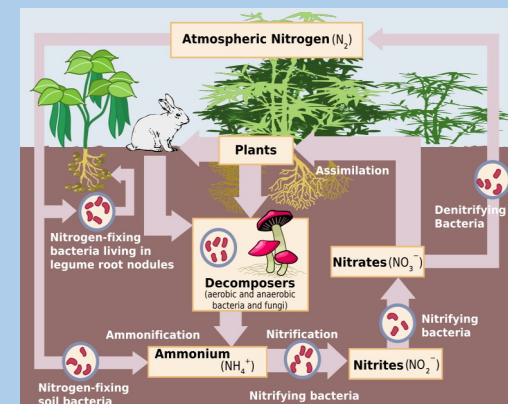
Nitrogen

Nitrogen makes up over 78% of our atmosphere, in the form of nitrogen gas (N_2).

Lightning and certain bacteria "fix" the nitrogen and convert it into ammonium (NH_4^+), nitrites (NO_2^-), and nitrates (NO_3^-).

The nitrates are consumed by plants, and then by animals and decomposers. Living organisms use this nitrogen for DNA and proteins, among other things.

Nitrogen returns to the soil once the living organisms die. It then returns to the atmosphere, thanks to denitrifying bacteria.



Johann Dréo

Stone Walls

The stones you see were deposited by a glacier near the end of the last Ice Age, as the Laurentide Ice Sheet thinned and retreated northward between 25,000 and 15,000 years ago. Most of the stones were buried beneath the soil.



Dioramas from the Harvard Forest's Fisher Museum portray the role of stone walls as New England's landscape was transformed over time.

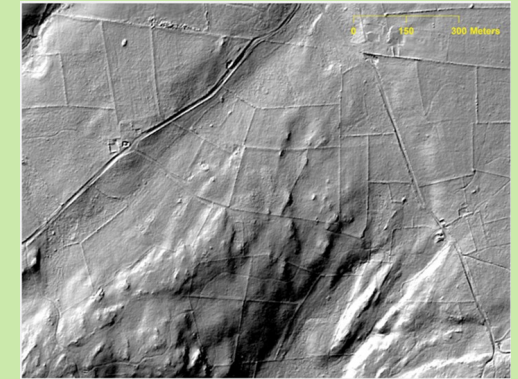


Curtiss Clark

The stones remained buried until the Nineteenth Century, when widespread deforestation led to extreme soil erosion and frost heaving, bringing them to the surface.

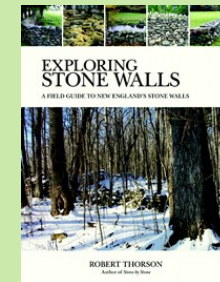
During settlement, farmers removed stones to clear fields. They built stone walls around crops, pastures, and property lines. The New England landscape was transformed as nearly all forests were replaced with agriculture. Stone wall use in Connecticut reached its peak between around 1775 and 1825.

Around the mid Nineteenth Century, many New England farms were abandoned as people moved out West or into cities. The forest reclaimed most of the old farmland, leaving the stone walls as relics.



Katharine Johnson and William Quimet

Light Detection and Ranging (LiDAR) scans from UConn research projects have revealed the topographical remains of the former agricultural network, now hidden by forests and revealed by stone walls.



Organizations such as UConn's Stone Wall Initiative work to preserve the walls and educate people on their history. For more information, check out the website:

<http://stonewall.uconn.edu/>

Vernal Pools

While “vernal pool” technically refers to pools that flood in spring, the term is often used to refer to pools that flood in spring or fall. These pools can be found throughout the Northeast, Midwest, and West Coast of the United States.

During flooding, these pools become an important habitat for a variety of wildlife. Each year, frogs, salamanders, insects, and other animals specifically seek out these temporary ponds for breeding. Unlike lakes and streams, vernal pools provide a place for these animals to grow up without predation or competition from fish.

Vernal pools also provide food for many mammal and bird species, especially migratory birds such as waterfowl and songbirds.

Unfortunately, this unique habitat is threatened by development.



Steve Faccio



Yale Scientific Magazine



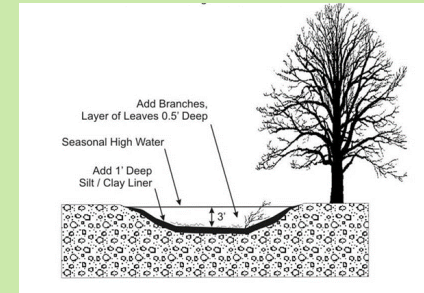
VA Herpetological Society



IN DNR



CT DEEP



UConn OEP

The HEEP's vernal pools include one that was created artificially in accordance with US Fish and Wildlife Services. A three foot deep depression was dug, and lined with an inch of silt and clay to prevent water from draining. It was then complemented with a layer of leaves and branches to provide nutrients and microhabitats.

Several species that rely on vernal pools for habitat: Spotted Salamander, Wood Frog, Painted Turtle, and Fairy Shrimp

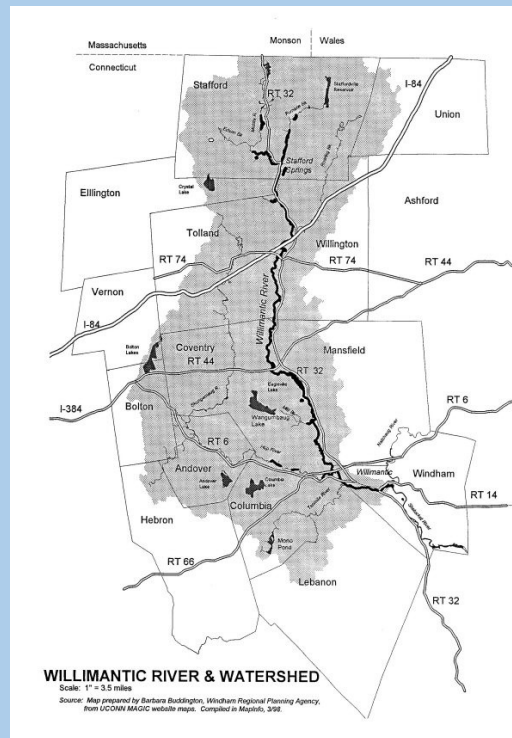
The Willimantic River Watershed

A watershed is an area of land where all surface and ground water collects into streams, which then flow into a common outlet, such as a larger river. The watershed can be as small as a stream fed by its immediate surroundings, or as large as the entire Mississippi River and its hundreds of tributaries.

The Willimantic River Watershed exemplifies the path of water flow: Cedar Swamp Brook carries water runoff from the HEEP into the Willimantic River. The Willimantic also collects water from nine other streams, over an area of 225 square miles.



AmericanTrails.org



Willimantic River Alliance

Once the Willimantic River has accumulated water from its own watershed, it becomes part of a larger system.

It combines with another river to form the Shetucket. This river, in turn, continues to receive water from tributaries before entering the Thames River.

Finally, the Thames River branches into an estuary system that enters the Long Island Sound.