

Virginia's Wildlife

Virginians are fortunate to share their home with a wide diversity of wildlife. Over 10,000 species of birds, mammals, fish, reptiles, amphibians, and different classes of invertebrates may be found from the depths of the Atlantic Ocean to Virginia's highest mountaintop, Mt. Rogers. Regardless of whether a species flies, swims, or crawls, it must have a healthy habitat to thrive. For a list of native and naturalized species in Virginia visit: <http://www.dwr.virginia.gov/wildlife/virginianativenaturalizedspecies.pdf>.



White-tailed deer (Odocoileus virginianus)
Found statewide with the densest populations
in northern Virginia. Photo by F. Eugene Hester

The Importance of Habitat

Habitat is more than just the space an animal occupies. Within that space are food, water, and shelter, arranged so that the animal can travel with minimal exposure to predators, foul weather, and other dangers. Like a well-built home, a suitable habitat must serve all of these purposes throughout the year.

The number of individuals of a given species that a habitat can support is called its "carrying capacity." This number fluctuates with the seasons, and a habitat generally supports more animals during the growing seasons than during the harsh days of winter. Interrelationships between species also influence carrying capacity in any location. The availability of prey species, for instance, affects the number of predators that can thrive.

Over the past 400 years, Virginia's wildlife habitats have changed in many ways. Where once grew large expanses of old growth forests covering hundreds of square miles, today younger forests are interrupted by fields, roads, and houses. In lower reaches, large wetlands and flood plains along the rivers which served as natural sponges have been filled to extend fields for the growing of corn and other crops. Large and small reservoirs cover areas where rivers and streams once freely flowed.

With the loss of habitat diversity and acreage comes a change in species mix and numbers. Gone are the woods buffalo, timber wolf, and other large mammals. In their place is a white-tailed deer herd numbering almost a million individuals, more robins than in colonial times, fewer warblers, and more bass but less trout. New plant and animal species have been introduced both on land and in the waters of Virginia. Some have had a minor impact others have threatened to destroy natural systems.

Wildlife Management in Virginia

Throughout the Commonwealth wildlife is managed by balancing three considerations: the health of the species, the health of the ecosystem, and the needs of the people who share the space. The Virginia Department of Wildlife Resources, www.dwr.virginia.gov, has the primary responsibility for managing wildlife species. Wildlife is a public resource and, as such, the state must ensure that populations remain healthy to be enjoyed by future generations. This means that citizens must obtain a proper permit or license to possess any wildlife species. Because the majority of wildlife live on private lands, public education and partnerships with individual land owners are extremely important to the overall health of all wild animals.

Management Tools Vary

The relationship between man and animal is unique and as diverse as the number of species. Several factors influence which tools are used by individuals and the Department of Wildlife Resources to manage wildlife. Although habitat management is a widely used tool for conserving wild animals, it is not always available. Most of the land in the Commonwealth is privately owned, and human uses sometimes come into direct conflict with best management practices.

Since wild animals often cross state and international boundaries, Virginia wildlife and fisheries biologists work with their counterparts throughout North America to maintain healthy populations and habitats. Many migratory species—ducks, songbirds, anadromous fish, and bats, for example—depend upon good communication among biologists from other states or other countries to guarantee that habitat needs are met.



Brown Pelican (Pelecanus occidentalis) Found in eastern Virginia along the tidal rivers, the Chesapeake Bay and Eastern Shore. Photo by Suzie Gilley

For management purposes, wildlife is legally divided into several categories. The largest of these are non-game species of wildlife, those that are not hunted, fished or trapped by humans. These species are important to the overall ecological health of natural systems. Amphibians, insects, crayfish, birds, and reptiles are represented in this group. Most non-game species are not intensively managed. They thrive in the yards, forests, rivers, and meadows of the state.

Animals that are managed for recreation are collectively called game species. These are the species that can be hunted or fished with a proper license, allowing you to take a specific limit or number of individuals. Game species include trout, largemouth bass, deer, squirrel, turkey and a variety of other fish, birds, and mammals. The populations of game species are managed in such a way that our “use” is not detrimental to the species’ survival.



Pandorus Sphinx Moth (Eumorpha Pandorus) Found in eastern United States. Caterpillars feed on grapevine leaves and leaves of Virginia Creeper. Adult moths feed on nectar. Photo by Suzie Gilley

Game species are managed by Wildlife Biologists and Conservation Police Officers, who enforce state regulations limiting the number of animals that can be taken. Some species, such as the bluegill, reproduce in large numbers, fishing removes a portion of these fish and provides recreation for thousands of citizens. For species, such as deer, the only effective management tool is an annual hunting season. Since much of Virginia is covered by a patchwork of fields and forests, deer populations are increasing. Deer also do well in suburban settings where they feed on ornamental bushes. Although there have been other methods tried to control the increasing deer herd here and across the United States, hunting remains the most efficient method.

The third category of wildlife covers those species that are listed as **endangered, threatened,** or of **special concern** by the federal or state government. These species are closely watched and intensively managed in order to stabilize their populations. Each species and its habitat is managed through a recovery plan designed to increase reproduction success, improve habitat, and provide protection from natural and man-made threats.

The goal is to keep of all wildlife management efforts are to keep any species off the Threatened and Endangered Species List by effectively monitoring and managing all wildlife populations.

Habitat Loss is Primary Threat

Virginia is home to over 100 species on its list of Endangered and Threatened Wildlife, a current list can be found at <https://www.dwr.virginia.gov/wp-content/uploads/virginia-threatened-endangered-species.pdf>. For most species the lost or degradation of habitat is the primary reason. When a species' habitat is compromised and a suitable arrangement of food, water, shelter, and space is disturbed, the animal must adapt, move on, or die.

Unfortunately, in most situations the species cannot adapt or move on and many individuals die. When continued destruction of a habitat occurs over time, species become endangered or even extinct. Mussels are a case in point. Virginia has over 50 species of endangered or threatened mussels. The majority of these freshwater mussels are remnant populations native to the Tennessee and Ohio rivers. The lower stretches of those river systems have been dammed, changing habitat conditions and creating river bottoms unsuitable for mussel habitation. As a result, the mussels were confined to headwater reaches (which extend into Virginia). Many of these species are now extirpated in Tennessee, Ohio, and West Virginia. The Department of Wildlife Resources has an Aquatic Wildlife Conservation Center in Marion, where much of Virginia's mussel research is underway. The growing of native mussels for reintroduction into sites where they had disappeared due to chemical spills or other habitat issues is helping to restore populations. To learn more about this effort visit: <https://www.dwr.virginia.gov/awcc/>

Amazing Adaptive Responses

Other species can adapt if given protection over time. Bald eagles initially became endangered due to overuse of the pesticide, DDT. The pesticide caused a thinning in their egg shells and reproduction was disrupted.

The eagle also did not tolerate human activity near its nest, resulting in a limited number of successful nest sites. With the banning of DDT and its subsequent decline in the eagles' food chain, along with protection of their nest sites, bald eagles made a comeback. Their status was down-listed from endangered to threatened in 1995. Finally, after decades on the T&E list the bald eagle was removed from the list in 2007.

Today, human population growth and settlement patterns threaten their continued recovery. But promising signs are at hand. Younger eagles are building nests nearer to humans and seem to be less skittish about sharing their space. It appears they are adapting to man's presence.

*American Bald Eagle (Haliaeetus leucocephalus)
Found statewide, near bodies of water where it can easily catch fish. Most common along the tidal rivers. Photo by F. Eugene Hester*



Eagle Nest's and Fledglings by Year

Date	Year	Active Nests	Young Fledged
1977	1	31	18
1978	2	36	18
1979	3	34	20
1980	4	35	35
1981	5	39	40
1982	6	45	40
1983	7	52	51
1984	8	60	57
1985	9	65	84
1986	10	66	83
1987	11	73	107
1988	12	80	118
1989	13	92	88
1990	14	104	142
1991	15	110	153
1992	16	131	141
1993	17	149	172
1994	18	144	158
1995	19	154	223
1996	20	180	243
1997	21	214	321
1998	22	229	314
1999	23	230	326
2000	24	270	414
2001	25	312	465
2002	26	329	501
2003	27	371	454
2004	28	401	612

Climate Change and Wildlife:

According to the Department of Wildlife Resources [Wildlife Action Plan](#)

“Over 900 of Virginia’s wildlife species are believed to be imperiled by the ongoing loss or degradation of their habitats. During the coming decades, climate change will exacerbate and intensify these impacts and the consequences to wildlife could be profound. For example, cold water species, like brook trout, which become physiologically impaired when water temperatures rise above 70 degrees Fahrenheit, could be extirpated from much of their current range. Other species in Virginia’s mountains, such as salamanders in the genus Plethodon, will be forced into smaller ranges at higher elevations by rising air and water temperatures.”

Information on actions being taken to help maintain wildlife and habitat diversity in the Commonwealth can be found in the Wildlife Action Plan. There is also a list of the 900 plus species in *Greatest Conservation Need*.

Unknowns:

How much time a population needs to adapt varies and is not readily understood. If a species fails to adapt and is not capable of moving on, it will become extinct. Unfortunately, we don’t have answers to the adaptation question and, in some situations, adaptation is not an option. In any ecosystem there is an interdependent relationship between plant and animal species. Although we may not currently understand all the links provided by and between ecosystems, both healthy plants and animals are critical and are mutually dependent, all living organisms need clean air and clean water.



Wood Duck (Aix sponsa) Found in eastern United States in forested wetlands. Nests in tree cavities or man made nesting boxes. Photo by F. Eugene Hester

Humans also depend upon healthy, diverse ecosystems. Think for a moment about the tremendous jobs performed by some of the “lesser” species:

- Insects are responsible for the pollination of much of the food we eat.
- Birds, bats, and other small animals feed on insects.
- Earthworms enrich soils so that plants can grow, and plants ex-change carbon dioxide for oxygen.

Each species has a “niche,” or job, within an ecosystem and must work with others to keep the entire system healthy.

Through research and continued observation, wildlife managers are learning how to balance basic animal needs with the needs of a growing human population in Virginia. While many decisions about wildlife remain, expanding our knowledge will help ensure that the decisions made are good ones.

Partners in Wildlife Conservation

Virginia families can help conserve wildlife by constructing and installing shelters for birds and mammals that require cavities for nesting or roosting. Information on proper placement, to prevent over-predation of the nestlings is available at www.dwr.virginia.gov/habitat . Improving public land by creating wildlife habitats on school grounds and state and federal properties, or privately in our own backyards, can greatly benefit species by providing much needed food, water, shelter, and travel corridors.

Additional Resources

Web Sites:

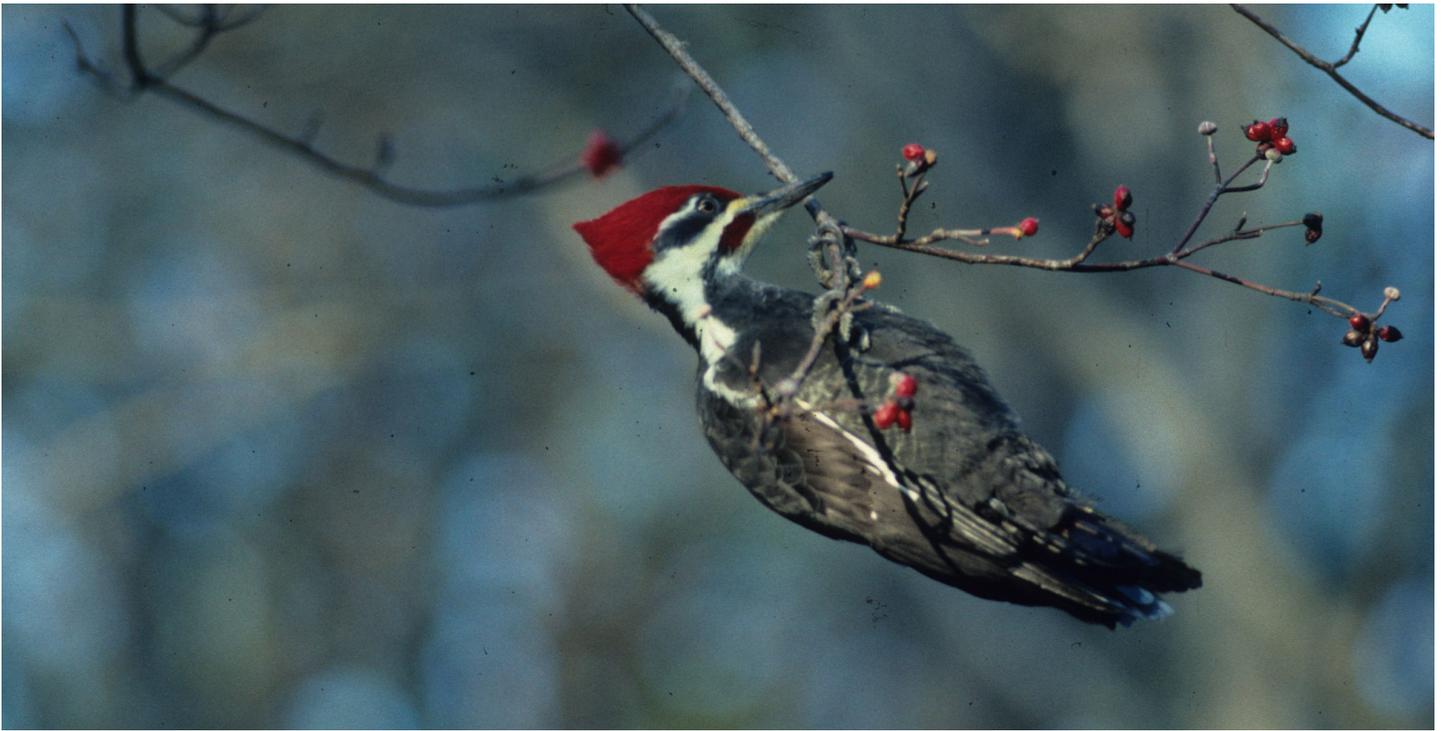
- [Virginia Department of Wildlife Resources](#)
- [Virginia's Wildlife Action Plan](#)
- [Project WILD](#)
- [U.S. Fish and Wildlife Service](#)
- [Coastal Virginia Wildlife Observatory](#)

Other Resources:

- **Virginia Wildlife** magazine a bi-monthly magazine sent to school libraries. Richmond: Virginia Department of Wildlife Resources.
- [The North American Conservation Education Strategy: A Tool Kit for Achieving Excellence](#) The award-winning *North American Conservation Education Strategy* (CE Strategy) delivers unified, research-based core concepts and messages about fish and wildlife conservation



Black and Gold Garden Spider (*Argiope aurantia*) Also called a writing spider this species weaves a zig zag through the center of her large orb web. Found statewide. Photo by Suzie Gilley



Pileated Woodpecker (Dryocopus pileatus) North America's largest woodpecker up to 19 inches in length. Found statewide in forested ecosystems. Photo by F. Eugene Hester

Fundamental Learnings Related to Wildlife Resources

- Humans and wildlife have similar basic needs and depend upon food, water, shelter and space.
- The health and well-being of both humans and wildlife are dependent upon the quality of the natural environment.
- Wildlife has many values including; ecological, scientific, aesthetic, economic, recreational social and intrinsic.
- Wildlife conservation and management techniques include information and education programs, regulations involving people, inventory, damage control, habitat management, stocking, artificial propagation, transplanting and direct implementation of wildlife populations.
- Plants and animals in ecological systems live in a web of interdependence in which each species contributes to the functioning of the overall system.
- Living things tend to reproduce in numbers greater than their habitat can support. Various mortality factors, such as disease, predation, climatic conditions, pollution, accidents, and shortages of life's necessities will cause a percentage to die each year. Carrying capacity is determined by climatic, geological, biological and /or behavioral factors along with human activities.
- Wise resource and environmental management can improve the quality of life for wildlife and humans.
- Philosophies, objectives and practices of various types of resource management are sometimes incompatible with each other and therefore conflicts and tradeoffs can occur.

Become a Wildlife Steward

Here are some simple ways you can help wildlife around your school or home.

- 1.** Don't use pesticides, if you need to use pesticides follow the instructions on the package. More IS NOT better.
- 2.** Plant native plants including native grasses.
- 3.** Rake your leaves in the spring, after the insects, amphibians and other animals are finished using them for cover while they hibernate.
- 4.** Limit your use of single use plastics. Bring your own shopping bags to the store.
- 5.** Keep your cat indoors or on a leash. Cats kill millions of species of wildlife each year.
- 6.** Become a citizen scientist: participate in Frog Watch, [I-Naturalist](#), e-Bird and other programs.
- 7.** Put up nesting boxes for cavity nesting birds, squirrels and other species.
- 8.** When possible, leave dead trees for woodpeckers, insects and other species. If the tree is tall enough that it may fall on a building or car, reduce the height of the stump so it is no longer a safety hazard but still be available to wildlife.
- 9.** Plant oaks, hickory and other long-lived trees that produce nuts for a variety of species.
- 10.** Plant native berry-producing trees such as cedar, holly or dogwoods.
- 11.** Follow feeding regulations for deer, bear and other wildlife species as established by the [Department of Wildlife Resources](#).
- 12.** If you break your fishing line while fishing, gather and properly dispose of it so wildlife do not become tangled in line.
- 13.** Do not release live bait into the water when you are finished fishing.
- 14.** Do not release non-native wildlife into the environment or transport and release any wildlife from one area to another.



Eastern-eyed Click Beetle (Alaus oculatus) Found statewide. When this beetle is placed on its back it will flip over sometimes propelling itself a yard away to escape predators. The beetle is harmless. Photo by Suzie Gilley

Who is Calling Tonight?

Objectives:

Students will record and identify species of frogs and toads calling in their neighborhood and compare the time of year against average statewide calling dates.

Materials needed:

- VDGIF Frog and Toad Guide with CD of calls available at www.shopdwr.com
- Access to ArcView or a map of the community
- Recording devices such as smart phones or cassette recorders, optional



***Bull Frog** (*Lithobates catesbeianus*) Virginia's largest native frog, found statewide in ponds, lakes and rivers. Photo by Suzie Gilley*

Background:

Each spring the night is filled with the calls of Virginia's twenty eight species of frogs and toads. Although it may sound like just noise, the experienced ear can pick out the call of each species the way some individuals can pick out each instrument in a symphony. Virginia's frog and toad symphony begins in January with the Wood Frog and Little Grass Frog. They are followed by the Spring Peeper and several of the Chorus Frog species in February. The night time symphony continues into October with some species calling all summer and other species going quiet.

Only the male of each species call and each species has their own distinctive call recognized by members of the same species. Within each species there are several types of calls including; advertisement for mates, encounter calls when they meet a rival and are defending their territory, release calls when a male is grabbed by another male who mistakes it for a female and a distress call that may be designed to startle a predator into releasing it so it can make its escape.

Calling begins as the weather warms and often after a heavy spring rain. Even in the most urban Virginia communities, you may be able to hear American toads or other species calling after a storm. Virginia frog and toad habitats are very diverse from woodlands to small ponds or lakes. Most species are limited to a region of the state; a few species can be found statewide. Statewide species will begin calling in the coastal plain of Virginia earlier than the same species in the Blue Ridge Mountains and valleys.

Procedure:

Choose 3-4 species common in your region, the Spring Peeper, American Bullfrog, Fowler's Toad and Green Frog are found statewide. Provide information for each species along with range maps and life history from <http://www.dgif.virginia.gov/wildlife/information/?t=1> and listen to the Frog and Toad Call CD provided with the VDGIF Guide to Frogs and Toads. The chart below may help students to hear and learn the different calls.

Frog	Call Sound
Spring Peeper	<i>Peep, peep, peep</i>
Carpenter Frog	<i>Pu-tunk, pu-tunk, pu-tunk</i> (like hammering)
Green Frog	<i>Plunk, plunk, plunk</i> (like plucking a guitar string)
Bullfrog	<i>Ba-rum, ba-rum, ba-rum</i>
Wood Frog	<i>k-wack, kwack, k-wack</i> (like ducks)
Pickerel Frog	<i>Zzz...zzz...</i> (like distant snoring)
American Toad	<i>Trillllll...</i> (long uninterrupted trill)
Green Treefrog	<i>Quank, quank, quank</i>
Squirrel Treefrog	<i>waak, waak, waak</i>

Once the students can identify local frogs from their calls the students can listen for each species at home or at a local park or natural area during the evening hours. Don't forget to send home a note to parents explaining what the students are listening for and the need to be outside. Parents may want to join their sons and daughters outside. If the frog cannot be identified, suggest that the student record the call and bring it to the class for possible identification

Students should record an estimated number and each species of frogs heard on a data sheet.

Frog Calling Survey

Student Name: _____ Date: _____

Location frogs were heard:

- Home
- Park or natural area _____

Weather including temperature:

Habitat Description:

Time of day	Species	Estimated number of calls in 5 minutes

Using ArcView to record the locations or place a colored dot on a community map where each species was heard calling. Record the date a species was first heard noting weather conditions and the latest date the species was heard calling. Data and recordings made of local frog calls can be entered into the Virginia Wildlife Mapping program to help manage local amphibian populations now and later <http://www.inaturalist.org/projects/virginia-wildlife-mapping>. Keeping this information from year to year will provide long term data on the population's status in the area.

Students can also conduct a habitat survey, measuring distance to the nearest body of water from their listening spot and noting if there is evidence of breeding, egg masses or tadpoles.

What Frogs Are You Hearing?

Virginia Frog Phenology (Calling/ Breeding Periods)

Species	Calling/ Breeding Period									
	Late Jan.	February	March	April	May	June	July	August	September	October
American Bullfrog					Early Season	Early Season	Early Season	Early Season		
Green Frog					Early Season	Early Season	Early Season	Early Season		
Pickerel Frog				Mid-season	Mid-season	Mid-season	Mid-season			
Southern Leopard Frog*			Mid-season	Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		Late Season
Atlantic Coast Leopard Frog**			Mid-season	Mid-season	Mid-season	Mid-season	Mid-season			
Wood Frog	Early Season	Early Season	Early Season	Early Season						
Carpenter Frog				Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Barking Treefrog					Early Season	Early Season	Early Season	Early Season		
Green Treefrog				Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Squirrel Treefrog				Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Pine Woods Treefrog					Early Season	Early Season	Early Season	Early Season		
Gray Treefrog				Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Cope's Gray Treefrog				Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Northern Cricket Frog				Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Southern Cricket Frog				Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Spring Peeper*		Early Season			Late Season					
Little Grass Frog	Early Season	Early Season	Early Season	Early Season	Early Season	Early Season	Early Season	Early Season	Early Season	Early Season
Mountain Chorus Frog			Mid-season	Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Brimley's Chorus Frog		Early Season	Early Season	Early Season						
Upland Chorus Frog		Early Season	Early Season	Early Season	Early Season					
New Jersey Chorus Frog		Early Season	Early Season	Early Season						
Southern Chorus Frog			Mid-season	Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
American Toad			Mid-season	Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Fowler's Toad				Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Southern Toad			Mid-season	Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Oak Toad				Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		
Eastern Narrow-mouthed Toad					Early Season	Early Season	Early Season	Early Season		
Eastern Spadefoot			Mid-season	Mid-season	Mid-season	Mid-season	Mid-season	Mid-season		

* Southern Leopard Frogs and Spring Peepers are known to periodically call during warm, rainy evenings in the fall.

** Recently described species to Virginia and calling/breeding phenology is not fully understood.

