Amphibian Conservation

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Providing good habitat for frogs and salamanders is a critical way to stem the decline in amphibian species.

Chorus frogs are rare or vanishing from southern coastal areas where they once were common. Leopard frogs are disappearing from Nova Scotia. Frogs with six legs and other deformities have been found in alarming numbers in Minnesota and elsewhere. The Cascades frog and western toad are declining in the Cascade Mountains of Oregon.

Since the 1970's, herpetologists in various parts of the world independently noted declines in some amphibian populations. Since amphibian skin readily absorbs contaminants present in soil and water, scientists began to look for environmental culprits.

A combination of local conditions, such as harsh weather or normal population fluctuations, and global factors, such as acid rain or UV radiation, are likely at work. Scientists have identified the following factors as their chief suspects, and on-going research is taking place around the world to better identify the causes of amphibian declines:

- Habitat destruction and modification- particularly the loss of interconnected habitats such as forest and wetlands or ponds have a serious negative impact on adult frogs and breeding success;
- Acid rain- changes in pH create conditions that many developing larvae cannot tolerate;
- Ozone destruction- increases in harmful UV-B radiation can damage DNA, impair immune function and affect the numbers of aquatic insects relied upon for food;
- Disease, exacerbated by environmental pollution;
- Chemical contamination from fungicides, herbicides, insecticides, and industrial chemicals may impair reproduction and development or make populations more susceptible to disease;
- Introduced bullfrog populations- bullfrogs introduced into the western U.S. have devastated many native amphibian populations.

When a species that has survived for more than 100 million years starts having reproductive problems and deformities, it warrants close scientific attention. But it also warrants action. There are both simple and elaborate projects you can undertake to enhance habitat for frogs on your property. Getting started now will help you play a vital role in amphibian conservation and ensure that our native frog species live long into the future.

The gray treefrog is a good example of the many frog species that spend most of their lives out of the water.

Leapers, Climbers, Walkers, and Swimmers

There are close to 100 different species of frogs in North America, so what species you have on your property will depend on where you are. In general, there are several main groups that you are likely to see in most places. The chart below describes the most common types of frogs.

Type	Description	Examples
Water Frogs, or True Frogs	Tend to be large and green, with long legs for leaping; true frogs are found near water. Some, like the bullfrog, stay in ponds all summer, while others prefer to retreat to land after breeding takes place.	Bullfrog, Green frog, Wood frog, and Leopard frog
Toads	Tend to be brown, dry, and warty, with short legs for hopping. They can be found hopping around in broad daylight (unlike most frogs, which are nocturnal)	Woodhouse's toad, American toad, Western toad, Great Plains toad, Canadian toad
Treefrogs	Tend to be small with smooth skin. Range in color from green to brown and gray. They can be distinguished by the large sticky toe-pads that they use to climb. Treefrogs spend most of their time in the woods, but are frequently seen in the spring at breeding time in shoreline vegetation near shallow ponds.	Green treefrog, Gray treefrog, Barking treefrog
Chorus and Cricket Frogs	More frequently heard than seen, chorus frogs are tiny, generally green or brown frogs found near shallow bodies of water with clumps of grass or other vegetation used for cover. Although related to treefrogs this group stays close to the ground and climbs little.	Spring peeper, Ornate chorus frog, Western and Pacific chorus frogs, Little grass frog, Northern and Southern cricket frogs
Spadefoots	Smooth skin with scattered bumps and a characteristic small, sharp-edged "spade" on each hind foot. The spade is used for digging underground during dry weather. Generally found in dry, sandy, or loose soil. Can be distinguished from other toads by their vertical pupils. Spadefoots emerge with spring rains and head for breeding ponds or vernal pools for breeding. Take care when handling them because many people have allergic reactions to their skin secretions.	Western-, Plains-, Eastern-, and Couch's spadefoot

That Miraculous Transformation

Frogs are *amphibians*, a word of Greek origin that means *two lives*. Most adult frogs live in damp places in woods or near streams or ponds. But when mating season comes, usually in the spring, they migrate to ponds, wetlands, and seasonal pools to lay their eggs. The eggs hatch into tadpoles, a completely aquatic stage that breathes with gills and eats algae. Depending on the species, they remain in the tadpole stage for as long as a year before they develop legs and lungs and move onto land as adults.

Many frogs breed *en masse,* often after the first warm spring rain. Emerging from winter's hibernation with wild celebration, their croaks, chirps, and trills announce that males are ready to mate. Frogs breed throughout the summer in northern areas and throughout much of the year in southern regions. Some, like woodfrogs, are *explosive* breeders, mating for only a few days each year, while others, like bullfrogs, may breed over prolonged periods of time.

Eggs, tadpoles, and adult frogs are a crucial component of many ecological communities. A vital link in the food chain, they serve as food for aquatic insects, fish, mammals, and birds. But carnivorous adult frogs do their share of eating too, feeding on mosquitoes, flies, and aquatic invertebrates. Some frogs even eat small fish, amphibians, reptiles, birds and rodents. One recent study found that a healthy frog population was removing over 50,000 insects per acre per year from the area under study.

Amphibian deformities have been noted in populations throughout North America, causing alarm among herpetologists.

Moisture is Essential

Like all amphibians, frogs need moisture to survive. Instead of drinking water, frogs absorb water through their skin. Though many species are found in watery environments such as ponds and wetlands, many adult frogs live in woodlands or grassy areas and return to ponds only to breed each year. To stay moist, frogs seek damp hiding places, such as under leaves, rocks, logs, or debris piles.

Canaries in a Global Coal Mine

Because of their complex life cycle and moist, permeable skin, frogs are exposed to both water and land pollution during their lives. Likewise, their unshelled eggs are directly exposed to soil, water and sunlight. And because they never travel far, staying in fairly confined regions throughout their lives, frogs and other amphibians are good indicators of local environmental conditions.

Throughout the world, frogs also are adversely affected by global environmental phenomena. For example, frogs absorb pollution, such as acid rain or pesticides in surface run-off that enters the water from the air or the ground. Because of their sensitivity, frogs have been likened to the canary in the coal mine that bodes of environmental ill.

Recognized as a global phenomenon in the early 1990s, the scientific community is now joining forces with conservation organizations and governmental agencies to better research potential causes of amphibian declines, while addressing known problems before it's too late. Audubon International is participating in *Partners for Amphibian and Reptile Conservation*, a national consortium of governmental and non-governmental agencies to promote amphibian conservation.

Consider the types of habitats on your properties and the actions you can take that would be most beneficial to amphibians.

Getting Started: Enhancing Habitat for Frogs

You can do many things to encourage frogs on your property and in your local community. The simple actions you take, when repeated many times over by landowners throughout North America can have a significant positive impact. And an abundance of frogs on your property will be strong evidence that you are taking good care of both land and water.

Take a frog's point of view

To create good habitats for frogs and other amphibians, it may help to consider their perspective: What would you look for if you were a frog? Moist hiding places, shallow pools, lots of plants for cover, and insects for eating top the list. These conditions can be easily created on most properties and you can tailor-make your frog habitat to suit your site.

When enhancing habitat for frogs, there are three primary things to do:

1. Make sure there are good habitats for adult frogs;
2. Provide breeding sites in the spring;
3. Maintain safe corridors between woods and ponds.

Here are a number of specific projects you can undertake to maximize good habitat for frogs:

Ponds

1. Construct a small pond or shallow pool with gently sloping sides, or designate an existing pond for frog and amphibian habitat. Frogs and other amphibians rely on shallow ponds for breeding and during the aquatic stage of their lives.

2. Make sure there are breeding sites available in the spring. Most frogs prefer shallow ponds (less than 3 feet deep) with emergent aquatic vegetation growing in them. Because fish eat tadpoles, the best breeding sites are ponds without fish, or at least ponds with extensive marshy areas too shallow for fish.

3. Introduce native emergent and shoreline plants to pond margins. Plants such as arrowhead, pickerelweed, and spike rush provide food and shelter for tadpoles, salamanders, and turtles.

4. Place logs and rocks around a portion of the pond bank to create hiding places for frogs and salamanders and basking sites for turtles.

5. Create a brush pile at the water's edge to provide shelter. Slopes on the northern edge of the pond are ideal places for brush piles or logs since they tend to be more cool, shady and moist.

6. Resist introducing non-native fish, introducing bullfrogs, or stocking fish in ponds with healthy frog populations.

Backyards

1. Create hiding places for toads by building small rock piles, log piles, and brush piles close to shrubbery or in gardens.

2. Make a *toad abode* by sinking a clay flowerpot into the soil in garden or landscape beds. The pot should lie on its side, with the opening facing north, and be partially filled with soil. The *toad abode* will provide a moist shelter.

3. Construct a shallow backyard pool, without fish, to attract frogs and salamanders. If you would like to receive more information about undertaking such a project, please call us for resources.

4. Remember that frogs rely on good water quality, both on and off your property. Always keep septic systems in good working order, repair your car quickly if you detect leaking oil, and properly dispose of hazardous household wastes. Support local water conservation and water quality measures to prevent pollution and keep local streams, wetlands, ponds, and lakes healthy.

Wooded wetlands are ideal places for frogs and salamanders because they lack fish, which prey on amphibian eggs.

Woodlands

1. Increase the number of natural shelters such as old logs, rocks, bark slabs, and small brush piles. These will provide habitat for many adult amphibians.

2. Maintain undergrowth—thick in some areas. Tree frogs such as spring peepers hide in shrubby growth. In addition, insects that are attracted to woody understory are an excellent food supply for frogs.

3. Provide safe corridors between woods and ponds. Ideally, ponds should have *a no-mow, no-spray* buffer zone all the way around them. Similar corridors should connect a pond to woods. These areas can be mowed once a year in late fall to keep them from getting too overgrown. Make them as wide as possible for the site.

Grasslands/Prairies

1. Cultivate native grasses to provide the best food and shelter for frogs.

2. Make several small rock piles, especially along fencerows and near woodland edges to provide good hiding places.

3. Use rotational mowing or grazing in grassland areas to continually provide habitat for toads and prairie lizards.

4. Build a pond or produce a wet, marshy area in low spots where the water table is near the surface. Even seasonally-wet pools can provide breeding sites for amphibians.