



Adding a “FROG POND” To Your Landscape



Virginia is home to 27 species of frogs and toads and 56 species of salamanders, newts and mudpuppies. These animals are amphibians that begin life in water as larvae with gills and tails. As they grow, they may stay in the water or leave the water to develop and mature, depending on the species. After they've metamorphosed into an adult form, they may either return to water or spend the rest of their life on land adjacent to water.

Amphibians are an extremely important part of the food web, because they consume countless species of invertebrates, such as insects—terrestrial and aquatic—as well as spiders and crustaceans. Amphibians, in turn, are eaten by other animals, and in this way they help transfer energy from arthropods to other vertebrates.

Unfortunately, amphibian populations are in serious decline. Thirty-nine percent of the amphibian species that occur in Virginia have been listed in the *2015 Virginia Wildlife Action Plan*, and 60% of the total “species of greatest conservation need” in the *Action Plan* are those that live in or are associated with aquatic habitats.

Amphibians have moist skin and need to live in moist places, and because their skin is permeable, they're sensitive to changes in water quality in the surrounding environment. The chemicals we apply to our landscape—such as fertilizers and pesticides—and the heavy metals and other toxins that come from our vehicles or escape from manufacturing and other processes—are all flushed off the land after each rain event and end up in creeks, streams, ponds and other water bodies. As nutrients and chemicals accumulate in waterways, the pollutants have an adverse impact on amphibian populations and other aquatic organisms, which all need clean water to survive.

Habitat loss is another primary environmental stressor that is critically affecting amphibians. Every time we mow a drainage ditch; fill in a seep or other low-lying area; encroach on a wetland; plant lawn along the edge of a creek; pile riprap next to a river; allow invasive exotic plants to replace the native vegetation in riparian and other aquatic zones—and this list of detrimental practices goes on and on—we effectively remove or degrade habitat to the point where it can no longer support the life that was once there.

YOU can make a difference! There are many ways to restore habitat where you live: use native plants in landscape beds and along drainages to slow runoff and to filter pollutants from the water; control or remove invasive non-native plants; recycle organic nutrients back into the soil by composting leaves and other yard debris; and add small water features such as a “**frog pond.**”

A frog pond will provide a place for adult frogs, toads and salamanders to lay their eggs and for young tadpoles and insect larvae to grow. The plants you install in and around the pond will provide shelter and protection from the weather and from other predators. Over time, a healthy pond habitat will attract a diversity of species, including birds and small mammals that will visit to take a drink, and you'll be rewarded with many enjoyable observations of wildlife in and around the water.

WHERE TO LOCATE THE POND:

- Choose a site with fairly flat ground (<6% slope).
- The area should receive at least 4-6 hours of sun per day, to promote plant growth within and around the pond. However, you'll want to use plenty of plants in and around the pond to **shade** the water, because shade helps moderate the water temperature and will help minimize algae growth within the water.
- Best placement of the pond would be in the vicinity of a shrub bed or other planted area that will provide additional cover to frogs and other animals that will move through the area to visit the water. Keep the pond away from trees, because tree roots (and annual leaf litter) can be problematic.
- Avoid placing the pond next to an area where you may be using fertilizers, such as a vegetable garden or highly managed lawn, because runoff containing excess nutrients (fertilizer) can cause too much algae to grow in the water.

POND LINERS:

- The easiest way to install a frog pond is to use a pre-formed, **hard** plastic liner “insert” that looks like a black bathtub with shelves in it. It should be at least 2 feet deep and preferably 3 feet deep for frogs to overwinter in the bottom. After you’ve dug the hole and placed the insert in the ground, be sure the top edges are slightly above the surrounding ground and completely level. Place potted aquatic plants on the shelves inside the liner, and weight the pots down with rocks. Since a pre-formed liner typically has steep (straight) sides, add a small log or branch to the water among the plants, to provide a way for any small mammals or birds that may fall into the water to climb out.
- If you decide to make a larger water feature and design the shape of the pond yourself, use a heavy plastic **flexible** liner – EPDM 45 mil plastic sheeting—which will need an underliner to protect it from rocks or roots in the soil. (A commercially made underliner is a good choice, because it provides ease of installation and good coverage. A lower cost alternative is to use an old carpet or 4” layer of damp sand underneath the plastic liner, but these may not be as reliable or durable.) As you dig, shape the soil in a way that will create different levels within the pond, and include gentle slopes and shallow depressions in the pond bottom, to simulate the varying depths found in a natural water body.
- Be sure the plastic liner is rated “aquatic safe,” i.e. not treated with algacides or fungicides.

BEST PRACTICES FOR SUCCESS:

- **Do not use chlorinated water in your pond.** Rainwater is ideal, but if you don’t have a rain barrel or cistern and only have chlorinated water, fill buckets with chlorinated water and let them stand for 24 hours to allow the chlorine to dissipate (or treat the water with a de-chlorination product), before adding to the pond. During the hot summer months when there isn’t much rain, you may need to add fresh (dechlorinated) water to your frog pond to keep the pond level full.
- **Do not add any fish to the pond,** because fish are predators of frog eggs and tadpoles, and fish also compete with frogs for food, such as insect larvae.
- **Do not buy tadpoles, snails or any other live organisms to put in the water,** which is one of the ways disease organisms are introduced to native amphibian populations and can have a long-term, devastating effect. Also, the organisms that are offered for sale were likely collected in other parts of the state (or even from other parts of the country), or they were raised from individuals that came from a different population than the one that occurs in your area. This means that the organisms came from a different gene pool, and moving them from one population to another contributes to “genetic pollution.” There’s no need to buy any animals, because if you create a healthy pond habitat, the amphibians and aquatic insects that naturally occur in your local area will quickly colonize it. “Build it, and they will come.”
- **About Mosquitoes:** Remember that a pond ecosystem will attract insects that eat mosquito larvae. For example, dragonflies and damselflies lay their eggs in water, and after the eggs hatch, the dragonfly larvae (naiads) develop and feed on aquatic organisms such as mosquito larvae. Aquatic beetles such as diving beetles also eat many types of larvae, including mosquito larvae. Tadpoles do not eat mosquito larvae (tadpoles eat algae and plant matter), but some *adult* toads and frogs—such as cricket frogs, chorus frogs and spring peepers—will eat *adult* mosquitoes. However, if you’re still concerned about mosquitoes, you can add a “Bt Dunk” to the water –*Bacillus thuringiensis israelensis* – which is a bacterium that kills mosquito larvae and certain types of fly larvae, but is said not to harm other insect predators or pollinators. Or, you can simply install a small re-circulating pump or “spitter” that keeps the water moving, to discourage mosquitoes from laying their eggs in the first place.

USE NATIVE PLANTS:

Use **native plant species** in and around your frog pond.

A good source of information is the *Chesapeake Bay Native Plant Center*, at www.nativeplantcenter.net

To find out what’s actually *native to your own county*: visit the **Digital Atlas of the Virginia Flora** (<http://vaplantatlas.org>), and type in the name of the plant species.

Here are some of our “favorite” native plants for an aquatic habitat:

Plants to put in **pots** in the water, **on the shelves**:

- ✓ Pickerel weed (*Pontederia cordata*)
- ✓ Arrowhead or Duck Potato (*Sagittaria latifolia*)
- ✓ Arrow arum (*Peltandra virginica*)
- ✓ Lizard’s Tail (*Saururus cernuus*)

Plants to put in **pots** whose leaves will **float** in the water:

- ✓ White Water-lily or Fragrant Water-lily or American Water-lily (*Nymphaea odorata*).

Plants to put directly **in the soil near the water’s edge**, where they’ll “get their feet wet”:

- ✓ Northern Lady Fern (*Athyrium filix-femina*)
- ✓ Cinnamon Fern (*Osmunda cinnamomea*)
- ✓ Royal Fern (*Osmunda regalis*)
- ✓ River Oats or Sea Oats or Wild Oats (*Chasmanthium latifolium*)
- ✓ Switchgrass (*Panicum virgatum*)
- ✓ Cardinal flower (*Lobelia cardinalis*)
- ✓ Swamp milkweed (*Asclepias incarnata*)
- ✓ Joe-Pye Weed (*Eupatorium dubium*)
- ✓ Virginia Blue Flag or Southern Blue Flag (*Iris virginica*)
- ✓ Obedient Plant (*Physostegia virginiana*)
- ✓ Soft Rush (*Juncus effusus*)
- ✓ Spiderwort (*Tradescantia virginiana*)
- ✓ Tussock Sedge (*Carex stricta*) –sometimes incorrectly labeled as “Pennsylvania sedge”
- ✓ Spotted Jewelweed (*Impatiens capensis*)
- ✓ Woolgrass Bulrush (*Scirpus cyperinus*)
- ✓ Monkey Flower (*Mimulus ringens*)

Do **NOT** buy (or transport or transplant) the following **NON-native, INVASIVE** aquatic plants:

- ⊗ Water Hyacinth (*Eichhornia crassipes*)
- ⊗ Parrot Feather (*Myriophyllum aquaticum*)
- ⊗ Purple Loosestrife (*Lythrum salicaria*) – note that “seed free” varieties can still cross-breed with invasive varieties to form plants that will produce seeds.
- ⊗ Hydrilla (*Hydrilla verticillata*)—often confused with the native Common Waterweed (*Elodea spp.*)
- ⊗ European Milfoil (*Myriophyllum spicatum*)
- ⊗ European Naiad (*Najas minor*)
- ⊗ Water Chestnut (*Trapa natans*)
- ⊗ Yellow Floating Heart (*Nymphoides peltata*)
- ⊗ Yellow Iris or Yellow Flag (*Iris pseudacorus*)

About COMMON DUCKWEED (*Lemna minor*): Duckweed is a native species and a common colonizer of ponds, because it’s typically attached to the other plants you’ve obtained from the garden center. Duckweed tends to prefer still water and water that is high in nutrients. You can keep duckweed in check by manually removing it from the water’s surface; or by keeping the water aerated with a recirculating pump; or by periodically (once a year, in mid- to late-February) cleaning out the bottom of the pond, where leaves and other organic debris accumulate and contribute to nutrient build-up in the water.

About CATTAILS (*Typha latifolia*): Although cattails are native, they can take over your pond and are impractical and not recommended for a residential landscape setting.

NURSERIES that specialize in NATIVE aquatic or wetland plants:

- *Environmental Concern* in MD (http://www.wetland.org/nursery_home.htm)
- *Wetland Plants Inc.*, serving VA and the Carolinas (<http://wetlandplantsinc.com/>)
- *AquaScapes Unlimited Inc.* in PA (<http://www.aquascapesunlimited.com/Native-Wetland-Plants>)
- The *Virginia Native Plant Society* has a listing of additional native plant nurseries (<http://vnps.org/conservation/plant-nurseries/>)

MORE RESOURCES:

- 1) *How to Create a Frog Pond*
<http://www.amphibianark.org/pdf/Husbandry/How%20to%20Create%20a%20Frog%20Pond.pdf>
- 2) *Backyard Ponds: Guidelines for Creating and Managing Habitat for Dragonflies and Damselflies*
www.migratorydragonflypartnership.org
- 3) *Pond Building Guide* (contains sections on “Characteristics of Amphibian Friendly Ponds” and “Mosquito Control”)
<http://www.amphibianark.org/mwg-internal/de5fs23hu73ds/progress?id=AYtEDN0-eDCMwOF5RQErLo8pVmK7-HIbakNYH9aW9Pw>
- 4) *A Guide to Creating Vernal Ponds: All the Information You Need to Build and Maintain an Ephemeral Wetland*
<http://herpcenter.ipfw.edu/outreach/vernalponds/vernalpondguide.pdf>
- 5) *A Guide to the Frogs and Toads of Virginia*—a 44 page field guide that comes with a CD of frog calls—available at www.shopdgif.com (\$9.95)
- 6) Species information such as life history of frogs, toads, salamanders and other amphibians –see the *Virginia Fish and Wildlife Information System*, at <http://vafwis.org/fwis/>
- 7) *The Eight Essential Elements of Conservation Landscaping* <http://www.chesapeakelandscape.org/resources/the-eight-essential-elements/>