



Water for Wildlife: Bird Baths and Backyard Ponds

Although backyard feeders are a popular way to attract birds, providing a source of water is equally important for creating a wildlife-friendly yard. By adding a bird bath or wildlife pond, you provide necessary water for not only birds but many other species as well. You also add an aesthetically pleasing element to your backyard. This fact sheet covers the basics of selecting and maintaining a bird bath. It also explains how to create a backyard pond to attract birds, insects, amphibians, and other wildlife.

Bird Baths

Adding a bird bath to your yard is the easiest way to provide drinking and bathing water for birds. A bird bath does not need to be elaborate or expensive, and it can be made with materials found around the house. Bird baths require only a small amount of care and maintenance, and they will attract not only birds but other animals as well.

Types

There are two basic types of bird baths: aboveground baths, which often hang or are placed on a pedestal, and baths placed at or near ground level. The type of bath you select will determine the kinds of birds you may see using it.

In general, birds that typically feed at bird feeders, such as the black-capped chickadee, house finch, and tufted titmouse, are most likely to use a bird bath located above the ground. Adding another bird bath on the ground may also attract less common backyard bird species since this type of bath more closely mimics a



Illustration by Jeffery Mathison

natural stream or pond. Ground-level baths also provide water for many other animal species, such as chipmunks and squirrels. Having both types allows you to provide water for the greatest variety of wildlife species.

Bird baths come in a variety of sizes and materials, and they can be found at most garden, home, and pet stores. They range from about \$20 for a simple hanging terra-cotta or pedestal concrete bath to several hundred dollars for a cast-iron or aluminum bath. You can make an inexpensive bird bath from materials found around the house, such as the inverted lid of a garbage can or a large terra-cotta plant saucer. Either place these directly on the ground or attach them to a rope or chains to hang from a tree branch.

Whether you buy or make a bird bath, keep in mind what is most attractive to a bird. Birds do not like slippery surfaces, and baths made out of materials such as glazed pottery or smooth plastics are not as attractive as those with a rough surface, like concrete or terra-cotta. Whether you already have a bird



bath or are making one, provide a nonstick surface by adding a few small rocks or even bathtub stickers. In addition, birds will only use a bath with shallow water, no more than 2 to 3 inches of water at the deepest.

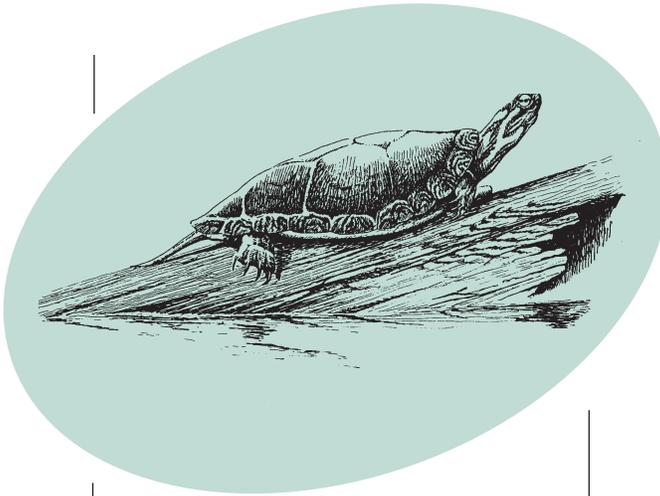
Another way to attract birds to your yard is to add a dripping or misting water feature. A dripper adds water slowly to a bird bath from above, creating the sound of water dropping into the bath. You can purchase one from many of the same places that sell bird baths, or you can make a simple version with a plastic soda bottle or milk jug. Simply fill the bottle with water and puncture a small hole through the bottom. Then attach the bottle above the bath water and allow it to drip in. You will need to refill it daily.

A mister is another popular water feature. You can place it anywhere in your yard by attaching it to a garden hose. Many birds, especially hummingbirds, enjoy flying through the fine mist that is created. Mistifiers are also commonly sold where bird baths are found.

Location

Birds like to have a safe place to drink and bathe, so it is best to place your bird bath near shrubs or some low tree branches to allow them to escape quickly if aerial predators are nearby. In addition, a shady location will keep your bath from overheating in the summer and algae levels low. When you have a ground-level bath, however, it is important to be aware of any cats that may be able to sneak up and attack the birds using your bath. If this is a potential problem in your yard, place your ground-level bath someplace where the birds can see a cat or other predator approaching, typically 10 to 15 feet from the nearest hiding spot. Finally, do not place your bird bath beneath bird feeders because food and droppings will dirty the bath.

Illustration by John Sidelinger



Care and Maintenance

Ideally, the water in your bird bath should be changed every day to prevent dirt and debris from accumulating. Changing the water daily in the summer also prevents mosquito larvae from hatching in your bird bath, which is a concern where the West Nile virus may be present. You should also scrub your bath with a brush, mild soap, and water every week to remove algae.

Winter

The winter months can be especially difficult for birds and other animals since water can be scarce. Maintaining your bird bath throughout the winter will ensure a constant supply of fresh water. A variety of heated bird baths will keep the bath water above freezing during the winter. Submersible heaters that you can place directly into the bath water are also available. Both types require a nearby electrical outlet. You can also use a solar heater for your bird bath. These work well under sunny conditions, but not when it is cloudy or overcast.

The Next Step: A Backyard Pond

If you decide that you want to add a larger water feature, attract a wider variety of wildlife, or add an aesthetically pleasing feature to your backyard, you may want to consider a wildlife pond.

Illustration by John Sidelinger

Backyard water gardens and ponds have become increasingly popular in the last few years, and the options can seem endless. Despite the large array of sizes, shapes, and designs, creating a simple pond can be cost effective and attract a variety of wildlife. Remember, however, that a wildlife pond is not the same as the ornate water garden you may see advertised in garden stores or magazines. The most effective wildlife ponds blend into an informal yard or garden

that has trees and shrubs designed to attract wildlife. If you do decide that a wildlife pond is right for you, you'll need to make some important decisions before you start digging.

Planning a Backyard Pond

One of the first questions to consider is what type of wildlife you want to attract. A backyard pond can range from a simple, shallow pool that attracts primarily birds to a larger, deeper pond with plants and waterfalls, or anything in between. Because there are so many options, it is important to consider the needs of the wildlife you are trying to attract. Listed below are some of the animals you may find at a wildlife pond, as well as some of their requirements in a pond.



Spring peeper

Birds

Birds use even the smallest ponds for drinking and bathing, provided the water is not too deep. A larger pond can also provide for birds, as long as part of the pond has a shallow edge. Shallow rocks or sand along this area provide a nonslippery surface that birds prefer. A dripping feature or waterfall is also very attractive to birds.

Amphibians

Amphibians use a backyard pond and the surrounding vegetation for food, shelter, and breeding. In the wild, frogs and toads lay their eggs in temporary pools or the shallow waters of natural ponds, seeking areas where fish are absent and cannot eat their eggs. Unfortunately, fish and amphibians do not usually co-exist in a wildlife pond either, and the usual recommendation is to have a fishless pond if you want to attract amphibians.

Once tadpoles develop, they require shallow water so they can successfully emerge from the pond. Some amphibians, such as bullfrogs, also need areas of deeper water (up to 3 feet), where they overwinter underneath rocks and vegetation. All amphibians require areas of wet vegetation, rocks, and logs around the pond's edges to provide cover, shade, moisture, and food.

Creating a Simple Backyard Pond

Below are general directions for a creating a simple backyard pond.

Plan your pond. Once you have decided on a site, outline a shape with string or a garden hose. Although the pond bottom does not have to be level, it is important that the top edges of the pond are level.

Excavate your pond to the desired depth. Remember that you want at least some areas with shallow edges so that birds, amphibians, and other animals can use your pond. Because shallow water can heat more quickly and therefore encourage algae growth, keep shallow areas in a shady location.

Add shelves. If you are going to have marginal or bog plants in your pond, you may want to add some shallow shelves within the pond to place the plants on.

Decide how much liner you need. With a measuring tape, measure the maximum length of your pond. Start at the edge, go down to the

maximum depth (include shelves), and measure across to the opposite side. Do the same for the maximum width. Add approximately 2 feet to both measurements. If you are unsure about your exact measurements, ask your supplier for help.

Place your liner in the pond. If you are using an underlay, position it in place before the liner. Anchor the edge of your liner in place with rocks or bricks.

Add a bottom to your pond. You can add a variety of different materials to the bottom, including sand or small rocks.

Add water. Place a pump, if you are using one, in the bottom of the pond but raised slightly to avoid becoming clogged. Add water to your pond slowly. If you are using tap water and want to add fish, let the water sit for a day or two to let the chlorine evaporate.

Finishing touches. Once the liner in the pond has settled, cut away excess liner to about 6 inches from the edge and cover with soil. Landscape the edge with plants. Enjoy!



Fish

If you decide you want to add fish to your wildlife pond, it is best to include native species that you would find in a natural pond. Many smaller sunfish species or a minnow such as the golden shiner can be kept in a backyard pond. Although exotic fish like goldfish and Japanese koi are popular, they would be out of place in your wildlife pond and are really only appropriate in an ornamental pond. Exotic fish, in addition, tend to be more brightly colored and are more easily spotted (and eaten) by predators. If you are concerned about fish eating your frog and toad eggs or tadpoles, you can increase their survival by providing areas of shallow water and dense submergent plants or rock structures where eggs and developing tadpoles can hide from predators.

Adding any type of fish to your backyard pond means additional effort in maintaining water quality, temperature, and an adequate food source. Most fish also require a pond with at least 2 feet of water, although the exact depth depends on which type of fish you introduce. In general, it is recommended to add only 1 inch of fish for every 5 gallons of water (remember that fish grow, so try to factor in their adult length).

Insects

Many beneficial insects such as dragonflies, damselflies, and water striders are attracted to a wildlife pond, especially if you put large numbers of flowering plants in or near the pond. Attracting a variety of insects to your pond also means there will be adequate food for birds, fish, and amphibians.

Questions to Consider When Designing a Backyard Pond

Once you have decided what type of wildlife you want to attract, consider where to locate your pond. While an ornamental water garden can be placed

almost anywhere in a yard, a wildlife pond should blend into the existing features of your yard and contain enough cover around it to make it a safe place for animals to use. The following are some things that may influence your choice of where to put your pond.

■ How much space do I have?

A backyard pond does not need to be large; even a small, 4-by-4-foot pond will attract wildlife. But most pond builders wish that they had built a bigger, rather than a smaller, pond than they originally had. Try to estimate how much space you can reasonably devote to a pond so that it is still effective and yet does not overwhelm your yard.

■ How much runoff might it receive?

Be sure to put your pond in an area that does not receive runoff from surrounding lawns or roads. Runoff can introduce herbicides, fertilizers, insecticides, or other contaminants into the water.

■ How high is the water table?

Placing your pond in an area with a high water table will cause the liner of your pond to buckle. You may need to add a drain, or you may want to consider a more natural, earthen pond that does not require a liner.

■ How rocky is the soil?

A site with many large rocks or tree roots may require additional excavation or may ultimately damage the liner.

■ How level is the site?

Consider slope when selecting a place for your pond. A level site is easiest to design, excavate, and maintain. Although water features can be placed in a pond on a slope, this requires additional planning and materials.

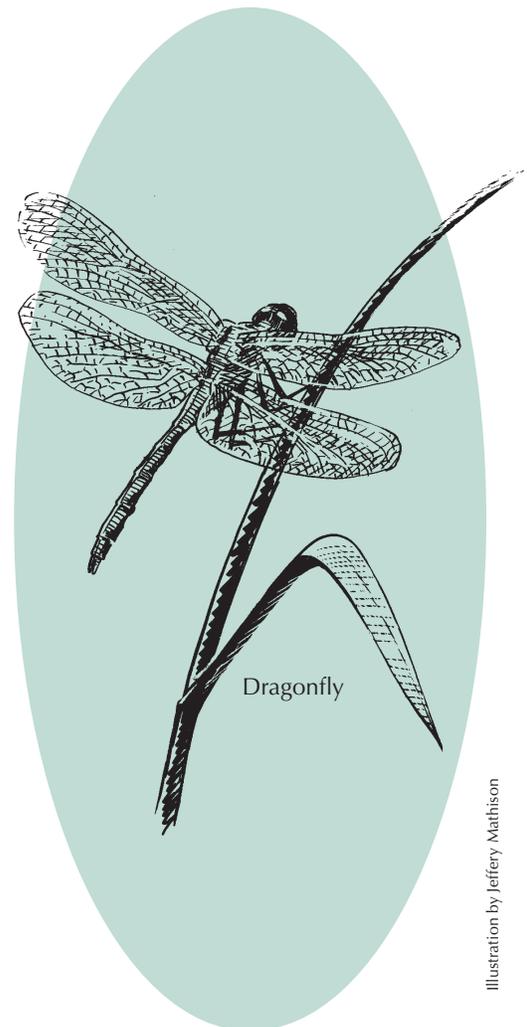
■ How much shade or sun does the site receive?

A site with some shade is ideal, especially for a very small pond, since shade prevents overheating and excess algae buildup in your water. However, if you

plan to add plants, especially many of the tropical water lilies, some will require a certain amount of daylight per day to bloom. Intermittent shade from deciduous trees is usually the most beneficial, as it warms the waters during the spring and fall, while providing cooling during the hot summer months.

■ Will the pond be located in a safe place?

The safety of your pond is an important consideration since even a small pond can be hazardous for small children. You may also want to check with your insurance company on liability issues regarding your pond. Before you start digging, make sure there are no electrical lines beneath the soil, and check local ordinances to see if there are any restrictions on water depth or if you will need a fence around the pond. In addition, if you are



Dragonfly

using a pump or other feature requiring electricity, it will need to have approved electrical fittings, and an electrician may need to install the proper outlets for you.

■ What types of special water features do I want?

A backyard pond has an unlimited number of design possibilities. Many owners add features such as waterfalls, dripping fountains, bog gardens, separate fish pools, and recirculating streams. While you can add these features later, it is best to have some idea of what you ultimately want in a backyard pond to make designing and buying materials easier.

Choosing Materials for Your Pond

Companies that specialize in water gardens and backyard ponds can be helpful sources of materials and information. Many home and garden stores also provide materials and advice. The Internet can be useful for gathering information and comparison shopping, and many amateur websites are devoted entirely to the successes and failures of pond building.

Liners

A liner is necessary for most backyard ponds to keep the water from escaping into your soil. Although it is possible to use concrete to line your pond, this material is difficult to work with and usually does not last for many years. A wide variety of flexible and preformed pools and liners for a backyard pond are now available from many sources. When choosing a liner, you have many options.

Types of pond liners

A preformed plastic or fiberglass pond lasts the longest and resists puncturing, but it can be more expensive and difficult to install. Typically, these types of liners are also very small, steep, and deep, and therefore you would need to add a sloping edge to make this type a beneficial wildlife pond. Flexible liners are usually preferred because they allow flexibility in

shape and size as well as a greater choice in liner material, thickness, and longevity. However, they typically require installation by at least two people and can be bulky and difficult to work with. Older liners may be made out of plastics such as PVC or polyethylene and are usually the least expensive.

Newer liners can consist of synthetic rubbers such as EPDM (ethylene propylene diene monomer) or a combination of materials, such as DuPont's Xavan® liners, which are the lightest and most tear-resistant. These also have the longest guarantee of all the newer flexible liners. An EPDM rubber liner is the most popular among pond builders, but it can be one of the heavier liners to work with. Whatever you decide to use, it is important to find a liner specifically designed for use in a pond; otherwise, it may be coated with toxic chemicals (for example, another type of EPDM liner is also used as a roofing liner). Swimming pool covers are not appropriate for use as a pond liner since they are coated with chemicals.

Longevity of liners

The longevity of the older liners varies widely, so check before you buy. In general, most newer liners are guaranteed for 25 to 50 years or longer. Resistance to ultraviolet (UV) light also affects the longevity of your pond liner since sunlight can break down the material and create holes. Most newer liners are UV resistant, but some of the older ones may require additional protection from the sun. Finally, some liners are more susceptible to puncture than others, and you will want to know how easy it is to fix any holes you encounter in your pond liner.

Protecting the liner

In rocky soils, an underlay may be needed to protect the liner from tearing. Old carpeting or newspapers are usually recommended as a good underlay liner. However, some newer liners (such as those made with Xavan) are very thick and puncture resistant and likely will not require the use of an underlay.

Pumps

You do not need a pump for your wildlife pond unless you add water features like a dripper or waterfall. Installing a small, recirculating pump adds a "gurgling" noise that attracts birds. But operating a pump also means that your pond must be located near an electrical source, and the pump may be costly to operate.

The size of pump you need is determined by the gallons per hour (gph) that it can recirculate. Gph is determined by factors such as how much water you have in your pond, how far and high the water in your pond has to travel from a pump to a waterfall or other feature (both vertically and horizontally), and whether you also need the pump to circulate water through a filter. Although most smaller pumps are submersible and fulfill the needs of most wildlife ponds, a pond with large waterfalls or a large filter may require a bigger pump housed outside the pond.

After deciding on pump size, you will probably find many suitable models. Pumps can vary widely in price, energy efficiency, and longevity, and you should consider all these factors when choosing one. It is better to wait until you have your pond completely planned. Then give your supplier the dimensions and details of your pond and let him or her help you choose a pump of the right size.

Filters

You will need a filter for your pond if you plan to introduce a large number of fish. There are a few basic types of filters: mechanical, biological, and plant. A mechanical filter moves water through a filter pad and removes large particles that can make your pond look cloudy. Biological filters help to remove high ammonia concentrations in ponds where there are many fish. A plant filter is a type of biological filter. Water is moved through a gravel bed of aquatic plants where colonizing bacteria and enzymes remove ammonia from the water.

Adding Plants to Your Pond

Plants are a key part of a wildlife pond. They can help keep the pond ecologically balanced by shading the water, removing excess nutrients, and providing food for your fish.

There are four basic groups of plants that you can add to your pond and the surrounding edges: deep-water, floating, submerged, and marginal plants. Although ideally you want to include a variety of each type, some plants have certain depth, sunlight, and temperature requirements and may not be appropriate for your pond.

Most suppliers of aquatic plants sell a wide variety of native and nonnative species, but it is a good idea to consider primarily native aquatic plants. To help you decide which plants to add to your pond, a good plant guide is invaluable for determining sunlight and depth requirements, whether the plant is native or exotic, and within which zones each plant is hardy.

Deep-water Plants

The leaves of deep-water plants typically float on the water's surface, but their roots grow in the soil (or pots). Water lilies are especially popular among pond builders, and there are endless varieties. But many tropical or subtropical species need long hours of direct sunlight and warm temperatures each day to bloom. In addition, both hardy and tropical species require protection in the winter (hardy species can remain in the pond as long as their roots do not freeze).

A combination of deep-water and free-floating plants (see below) should not cover more than 70 percent of the pond's surface. This helps to keep a balanced amount of sunlight for shading the water (helping to reduce algae levels) but allows enough sunlight for submergent plants growing below the water. Although it is best to buy deep-water plants directly in their containers, finding local suppliers of

these plants may be difficult. Mail order companies sell bare-root plants that can later be put into pots.

Free-floating Plants

The leaves of these plants float on the surface, but the roots are not anchored to the soil. Free-floating plants include species such as frog's bit and small duckweed. These and deep-water plants both shade and remove nutrients from the water, helping to decrease algae outbreaks. Although many species of floating plants, such as water lettuce and water hyacinth, are considered very invasive in southern climates, they are not hardy in the north and will die during the winter (unless they are brought inside). However, experts recommend avoiding potentially invasive species. Plants that are hardy in northern climates fall to the bottom of a pond during the winter and reemerge in the spring. Northern-hardy plants can grow rapidly and may need to be thinned out periodically during the summer to prevent them from overtaking the pond.

Oxygenators or Submergents

These plants grow completely or primarily under water, releasing oxygen and filtering out excess nutrients. The recommendation is to add at least one bunch of submergents for every 1 to 2 square feet of water. Many of the plants found in this group can also grow quickly and overtake a pond if they are not thinned out regularly. Native species include Illinois pondweed, eastern purple bladderwort, hornwort, common water milfoil, and broad waterweed. Avoid exotic and invasive species like hydrilla, Eurasian water milfoil, and parrot feather.

Marginal or Bog Plants

The roots of marginals are submerged or partly submerged in the water; marginals include cattails and other grasses, rushes, and sedges. These plants are commonly grown in containers and placed on shelves within the pond or planted around its edges. Many types of emergent plants, such as spotted joe-pye weed, sweet flag, soft rush, and pickerel weed,



Arrow arum



Joe-pye weed



Arrowwood

are especially attractive to either butterflies or dragonflies.

Do not plant purple loosestrife. Although this plant has attractive purple flowers, it is extremely invasive.

There is no limit to the number of plants you can add to the surrounding areas of your pond. Many species attract butterflies and other insects as well as birds. Adding a diverse array of plants and grasses with logs and rocks will provide food and cover for both aquatic and terrestrial species around your pond. Beneficial native flower species that you can plant around your pond include joe-pye weed, cardinal flower, turtlehead, bee-balm, and black-eyed Susan. Shrubs include black chokeberry, buttonbush, winterberry, and spicebush.

Maintenance

The required maintenance for your pond depends on many factors, including the pond location, whether you use a pump or a filter, the number of plants you add, and whether you keep fish. Often a small pond requires more maintenance than a larger one since larger ponds tend to have a more balanced ecosystem.

Seasonal Maintenance

In the winter, both the fish and the floating plants in larger ponds can remain as long as the bottom of the pond does not freeze. You can add a heater to the pond in the winter. Many types are available; the size will depend on the pond size and how deep the water is. Suppliers of aquatic plants and fish can help you select a heater. If you are unsure whether your pond will freeze or don't want to install a heater, you can remove the fish and place them in an aquarium for the winter and store the plants with their pots in a cool place until spring.

As spring approaches, you may want to empty and clean your pond. As plants die and materials accumulate on the bot-

tom, occasional removal of debris is necessary. A pond that is balanced should not require yearly draining and cleaning. Smaller ponds may require emptying every two to three years; larger ponds may go longer. All the water needs to be removed and fish and plants placed in a temporary location. Mud and debris are removed from the bottom and any repairs can be made to the lining at this point. This is also a good time to add new plants or divide and replot overgrown or root-bound plants.

During the summer, you may want to check the water chemistry of your pond, especially if you have fish. Water loss can also be a problem during the summer due to evaporation, and additional water may need to be added. Keep in mind, however, that tap water can contain chlorine and other minerals that may harm aquatic life or encourage algae blooms. If the deep-water or floating plants in your pond become overgrown or invasive, you may need to remove or cut back some to keep the surface of your water at least 30 to 40 percent open.

Finally, during the fall, you may want to place a net over your pond to catch falling leaves. This will prevent an excess of decaying leaves in the bottom and lengthen the time between cleanings. You may also want to cut back the growth of any submergent or marginal plants.

Algae

Algae are a natural and necessary part of a pond ecosystem, but excessive algae buildup is a commonly cited complaint of many backyard pond owners. Two basic algae types may occur in your pond: microscopic plankton, which turn water into a pea soup color, and a type of filamentous algae (most commonly known as blanketweed), which occur in large mats. A proper balance of submerged and floating plants is the best prevention and cure for excessive algae problems that turn water green. Restricting your pond to a small number of fish also helps pre-

vent the buildup of waste that encourages algae growth.

Algae blooms can be most problematic in the spring as sunlight and warmer temperatures increase mineral levels in the pond. This condition is usually only temporary, however, and continual changing of the water may make the problem worse. Blanketweed can appear in ponds with good and bad water quality; it is usually best dealt with by regular removal with a stick or rake and taken out of the pond (it makes a great mulch). Although you may be tempted to use algacides on blanketweed, you will find they provide only a temporary solution for the problem, which requires continuous treatment.

The Finished Product

Once your pond is complete, sit back and enjoy the magic of water. Watch birds drinking and bathing, see dragonflies and damselflies racing back and forth, and watch the miraculous transformation of egg to tadpole to frog. Water works wonders for wildlife.

Suppliers of Liners, Pumps, and Filters

Check with your local garden store or plant nursery to see if it also sells equipment for backyard ponds. Below are other sources.

Maryland Aquatic
Jarrettsville, MD
410-557-7615
www.marylandaquatic.com
Large supplier of materials and plants

Ponds, Plants and More
Bentleyville, PA
724-239-6673
www.pondsplantsandmore.com
Large supplier of pond supplies and plants

Suppliers of Plants

The Pennsylvania Native Plant Society (www.panativeplantsociety.org) has a listing of places in Pennsylvania (and surrounding states) that sell native species. In addition, the Pennsylvania Flora Project (pafflora.org/original) has a searchable database of native wetland species. The Pennsylvania Department of Conservation and Natural Resources publication *Landscaping with Native Plants in Pennsylvania* provides guidelines for selecting native plants to use in Pennsylvania. It is available free of charge. Call 717-787-3444 to request a copy.

Other retail suppliers:

WaterWays Nursery
Lovettsville, VA 20180
540-822-5994

Mail-order supplier of aquatic and marginal plants

Lilyblooms Aquatic Gardens
North Canton, OH
1-800-921-0005

www.lilyblooms.com

Supplier of native and nonnative aquatic plants and supplies, including mail order

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