

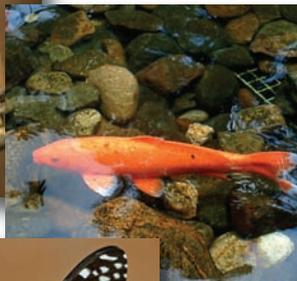


# Bitten by the Water Bug

*"Everywhere water is a thing of beauty gleaming in the dewdrop, singing in the summer rain."*

*– John Ballantine Gough*

Golf courses with **advanced water features** provide a corridor for numerous species of migrating and resident birds whose survival is dependent on areas surrounding rivers and lakes. Golf course superintendents systematically protect the waterways and outfit their properties with specialized birdhouses and structures that attract and increase the population of a wide variety of riparian associate avian species. This close connection between superintendents and the environment with a controlled approach to managing the advanced water features has important conservation implications. That being said, let's turn our attention and examine water features on a smaller scale. Water gardens can add interest and beauty without the massive proportion and excessive cost for construction or maintenance that larger waterfalls, streams and lakes require.



Water gardens are frequently overlooked as a landscaping option at golf course facilities. Water gardens can transform an ordinary outdoor clubhouse patio into a tranquil paradise where visitors can relax, unwind, and enjoy quality time. Water features become a focal point of any garden with their charming sights and pleasant sounds. Beautiful water gardens have the natural ability to attract a variety of birds, butterflies, and dragonflies. Three types of water gardens and small water features well-suited to the golf course environment are fountain-scapes, pond-less waterfalls and eco-system ponds. Water gardens are less costly, require much less surface area and, depending on which type is selected, hold from only a few gallons up to tens of thousands of gallons of water. References and interesting websites that provide photo galleries, precise details, and installation instructions for small water features are provided at the end of this article.

**Fountain-scapes** are the smallest of decorative water features and include tabletop or wall fountains, container water gardens, stand alone fountains, bubbling urns, spitters, and fountains that incorporate an in-ground reservoir.

Container water gardens can be created using virtually any type of container as long as it has the ability to hold water. An antique bathtub, a galvanized pail, a favorite terra cotta flowerpot, or an old whiskey barrel all make excellent receptacles to contain a water garden. Once the container is chosen, make sure that it holds water. Any un-glazed pottery will need to be sealed and drain holes will need to be plugged. A wooden container such as a whiskey barrel can be lined with a rubber liner that can be affixed to the rim. Make sure the sealant is safe for plants and fish.

When planting a container water garden the same principles apply as with a conventional pot in which flowers are grown. A balance of plants that are different shapes and sizes will be the most aesthetically pleasing. Highlight one special plant, such as a lotus plant if planting a larger container or a pygmy water lily in a smaller receptacle. Using different colors also makes a striking appearance and provides a much simpler approach.

If adding fish to a container water garden, be sure to keep the volume of the container in mind. Water in small containers goes through extreme temperature changes, which can be harmful to most fish. Mosquito fish however, can tolerate warm water quite well. Receptacles that hold more than 20 gallons of water are well suited to all varieties of tiny goldfish.

To discourage the growth of mosquitoes in stagnant water, a small 75-gallon-per-hour statuary pump fitted with a spitter or fountain head will be needed to keep mosquitoes

*(continued on page 7)*

away from a container water garden. If the fountain effect is undesirable, position the pump discharge just under the water surface to create movement. Maintenance is minimal, requiring the occasional addition of water to make up for evaporation. Doing this keeps the plants at the correct water level and the pump operating properly. Because of the cold Midwestern winters, aquatic plants and fish in a container water garden may need to be replaced annually.

Water fountains have existed for thousands of years. Stand alone fountains are gaining in popularity because they are easy to set up and maintain. A wide variety of styles and finishes are available, ranging from impressive brass to majestic Italian multi-tiered marble to simple resin fountains. They are made to "stand alone" meaning they don't need any counterparts to make them function. Much like a tabletop or wall fountain all that is required is to add water, plug it in, and enjoy. The fountains can be placed in the indoor foyer of the clubhouse front entrance to greet guests, or they can be set outside on the deck or patio. The sound of trickling water draws visitors into the garden and provides a place to relax while enjoying outdoor spaces.

Bubbling urns and spitters are larger water features that are typically set atop an underground basin which can support up to one ton and hold up to 75 or more gallons of water. Once the urn column fills, water spills out and over into the underground basin, which pumps the water back up. If a spitter, large basalt column, or brass sculpture is preferred, they can be set on the reservoir and a pipe will transfer the water from the basin up through the center of the spitter or fountain. The only limiting factors are the size of the installation area and budget.

**Pondless waterfalls** are a great option if you are concerned about the safety issues that come with a traditional pond. This type of water feature is simply a re-circulating waterfall and/or stream without the presence of a pond. The visual and audible benefits of running water cascading down a waterfall and stream can be enjoyed without the maintenance of a pond.

Because there is no pool of water, there are none of the safety issues associated with a traditional pond. The price of a pondless waterfall will be lower than a pond because less labor and materials are required. The golf course superintendent also will find that operating costs are lower because you're not dealing with an established ecosystem. It's not necessary to run the pump 24/7, and the reservoir only needs to be filled every few weeks to compensate for water loss because of evaporation. The small size of the pondless waterfall means it can be built and enjoyed anywhere. If you leave enough room around the base of the waterfall, it's easy to add a pond in the future.

The pondless waterfall works much like a regular waterfall and stream with a pond. First you need to dig a hole deeper than a normal pond, line it with carefully positioned rock, boulders and gravel and fill it with water. The water is then circulated from beneath the rocks and gravel by a pump that sits on the bottom, inside a customized filtered casing. A pipe runs from there up to the above-ground upper waterfall filter and water basin, which is likewise fabricated with plant and fish-safe plastic molding. Water overflows the upper basin and cascades down the waterfall where it falls back into the reservoir. Since the water never fills above the level of the rock and gravel fill, it gives the appearance of a waterfall without a pond, when in fact the "pond" is below ground but not visible. Another option is to adjust the liner upward, which raises the water level to barely submerge the interior rock and gravel inside the reservoir with the accent boulders protruding above water and covering the liner around the perimeter.

**Ecosystem ponds** are the most dynamic of the smaller water feature types, but they can be easy to understand if the components that go into a basic, functioning aquatic ecosystem are understood. An ecosystem pond works with "Mother Nature" to provide food, shelter, and safety to the wildlife around it and an all-natural, low maintenance piece of paradise. It's important to remember, however, that all of the fundamental components must be present in order for a true ecosystem to be in place. Eliminate one of these irreducible constituents and you've got an unbalanced ecosystem that won't be so low maintenance anymore. The following items are required for an ecosystem pond:

*Circulation system* or waterworks include the pump and plumbing. The size of the waterworks is extremely important for the aesthetics of a water feature and is dependent on the desired size and style of the pond and waterfall. An efficient circulation system keeps the water flowing and provides the proper oxygen levels for healthy fish and plants.

A *filtration system* is required to maintain a clean ecosystem pond. Two types of filters serve this purpose. A biological filter is available that provides the necessary surface area for beneficial bacteria to colonize and remove excess nutrients from the water. A mechanical filter will pre-filter and house the pump and skim debris from the water's surface to prevent the accumulation of organic matter on the pond floor. The removal of organic matter and nutrients is critical in managing against algae formation in the pond.

*Fish* are an integral part of any ecosystem pond. Often misunderstood as culprits, fish in fact serve an important role in the maintenance of an ecosystem pond. Fish actually reduce

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pond maintenance, as they graze on string algae and bottom feed from the pond floor. Larger goldfish species called comets are bottom feeders and a long-lived species of fish even in ponds that freeze for the winter. The comets are completely self sufficient but will grow and reproduce faster if additional food is provided. For the fish connoisseur a more decorative and colorful fish species known as Koi is available. Koi are a hybrid of the carp family and a favorite amongst water garden fanatics who have time to devote to their needs. Koi require daily feeding; their health must be closely monitored. A floating heater should be activated in addition to the running waterfall in order to keep the pond's winter ice formation open and provide ample quantities of oxygen for Koi to survive. Manmade structures (underwater caves, walking bridges, etc.) are usually provided to protect the fish from predation.

*Aquatic plants* naturally provide distinctive textures and desirable forms to the garden. Thriving from the excess nutrients in a pond and depriving algae of its food source, aquatic plants in a water garden, given proper coverage, are critical for the overall health of the ecosystem pond. A combination of both annual and perennial aquatic plants will provide the best possible eco-system pond presentation.

*Rocks, gravel, and bacteria* are the final elements of the ecosystem pond. Carefully positioned rocks, boulders, and gravel add the proper dimensions to the pond and insure that the waterfall is flowing as desired. The stone structures protect the pond liner from ultraviolet light degradation and provide

enormous surface area for advantageous bacteria to break down oversupplies of nutrients in the water and dissolved organic debris on the pond floor.

The ecosystem pond is the most popular type of water garden among enthusiasts because it "has it all." Water gardening has been popularized, evolved and improved over decades in residential applications. Water gardening is a largely untapped technology which can provide a viable landscaping option to enhance golf course clubhouse and grounds facilities. **-OC**

**Credits and references are as follows:**

- Google Search Aquascapeinc.com and click on fountainscapes, pondless waterfalls, ecosystem ponds, advanced water features or the photo gallery.
- Google Search Garden-Fountains.com scroll down and click on Garden Fountains: Wall, Indoors, Outdoors and click on any category of fountain or water feature.
- Google Search Fountains-Fountains.com scroll down and click on fountains for outdoor and indoor use. Constructed of concrete... and click on any category of fountain.
- Google Search Italian Water Fountains scroll down and click on European/Wall Water Fountains/Antique Wall Fountain.
- Google Search Water Gardens scroll down and click on Water Gardens Installation and Maintenance.
- Google Search Water Gardens scroll down and click on How to Build and Construct a Water Garden.
- www.berkeysupply.com
- Ridgemoor Country Club.com

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