

## Water Features for the Garden

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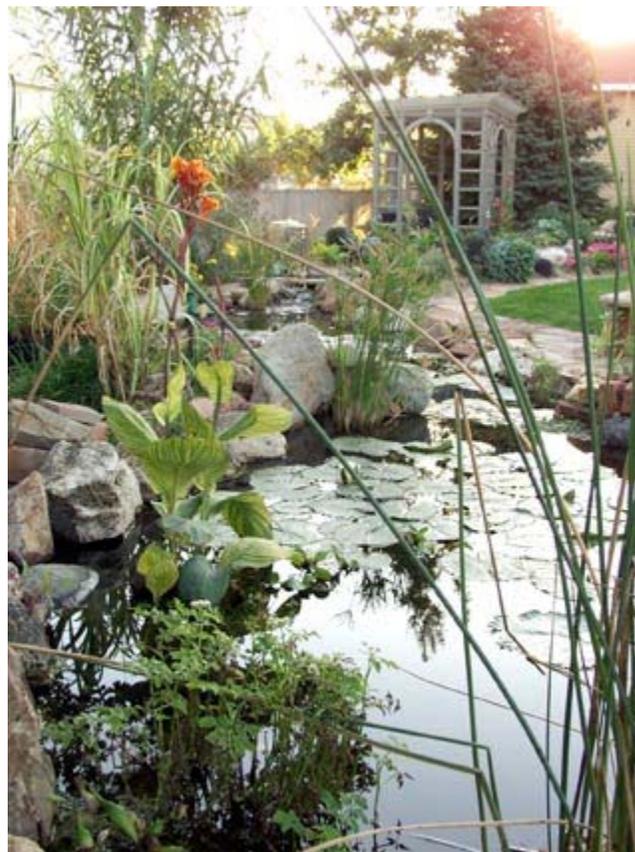
As humans, we experience tranquil feelings from the sight and sounds of moving water. Water brings a restful quality to even the busiest backyard, the pleasant sounds detracting from unwanted noise and traffic sounds. Garden visitors frequently migrate to water features before enjoying other features of the landscape.

Utah gardeners who conscientiously endeavor to conserve water in the landscape agree that a pond does not waste water, but rather puts it to good use. More water is used on turf than a pond loses to evaporation, especially when plants cover a portion of the pond surface.

Creating a water garden may seem complicated, expensive and labor intensive. In reality, a water feature takes as much time and effort as the gardener wishes to expend on it.

Water gardens range in size from small containers to large in-ground ponds - reflecting the amount of time and money invested. A small birdbath filled with 2-3 inches of water having the base surrounded by plants is a simple venture. Freestanding fountains, wall fountains, and in-ground ponds ranging from small preformed pools to large ponds require more time and money. Ponds with waterfalls incorporated in the design are more expensive and require a greater investment of time.

A backyard pond may also be considered a liability. Homeowners should check with their home insurance provider about restrictions before construction begins.



[www.utahwatergarden.com](http://www.utahwatergarden.com)  
Ross's Pond

Once a type of water feature is chosen, placement in the landscape should be considered. Most people enjoy the ability to view their garden from the

interior of their home. The water feature may be the focal point of the garden. The shape and design should merge with the existing environment; a natural shape in an informal garden, a geometric shape in a formal area.

An in-ground pond should be placed away from rain or irrigation run-off. Rain or irrigation run-off can carry fertilizers, chemicals, and organic debris into the pond. These elements contribute to algae growth and can be toxic to fish.

A nearby water source is necessary. Even though a pond may recycle water through a pump and filtering system, hot summer days cause some of the water to evaporate. Periodically, water must be added to the feature.

The gardener should decide which aspects of the water feature to emphasize. If fish and plants are incorporated into the feature, this small ecosystem must be placed in an area with enough sunlight for good plant growth, be somewhat sheltered, and out of the way of trees or shrubs that may shed leaves, berries or blossoms. Most water plants require a minimum of 4-6 hours of sunlight for plants to thrive.

The type of fish placed in the pond will also determine the size and depth required. A pond with large fish like koi needs a 3 foot depth, in addition to a filtration system. Goldfish only need a 24 inch deep pond in a moderate climatic area. Areas that get quite cold require that the pond is 12-16 inches deeper than

the freeze zone. In northern Utah the pond may need to be 36-48 inches deep. The deeper the pond, the more likely the fish will survive the winter.

## Construction

Along with a decision on a location and size for the water feature comes the choice from a variety of construction materials. Materials used include stone, cast iron, tile, concrete, or copper. Most freestanding water features

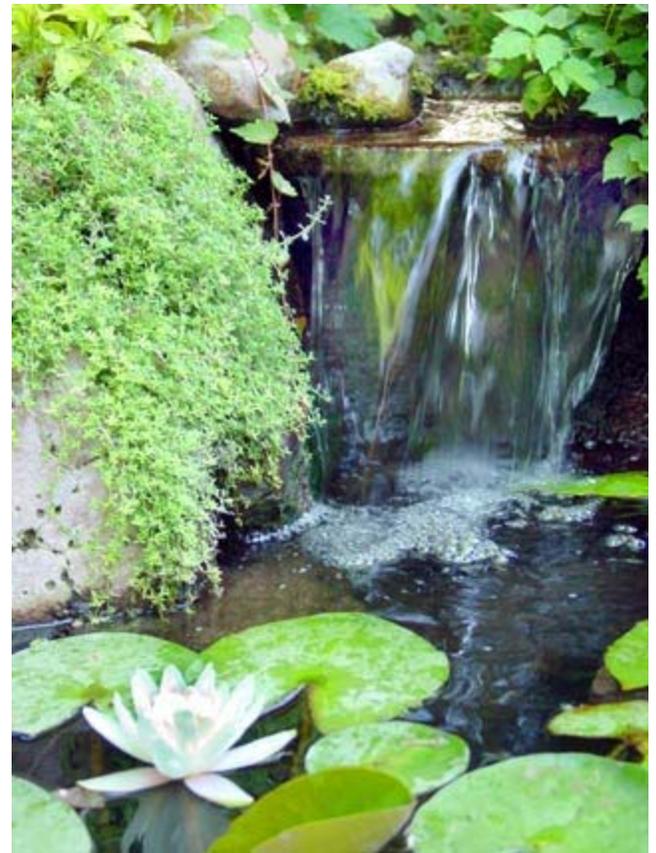
are

constructed of [www.utahwatergarden.com](http://www.utahwatergarden.com)

concrete, plastic, natural rock or fiberglass. Simple, inexpensive containers, such as a glazed ceramic or terra cotta pot or half-whiskey barrel (lined with waterproof sheeting or a plastic liner) may also be suitable for a 'pond.' Small goldfish will be happy in a small pond, but koi shouldn't be placed in these cramped quarters.

Freestanding fountains can be small enough to sit on a table or large enough to fill a portion of the yard. These fountains also require an electrical outlet and wiring which must be protected from winter damage. Wall fountains require a strong support wall in order to bear the weight of the fountain and also need an electrical outlet to power a pump. In addition to the traditional spray fountain, sheer surfaces or spheres covered with water look beautiful in the garden amidst growing plants.

Small garden ponds are constructed mainly of flexible liners or pre-formed shells. When a liner is used it should be specifically 'fish grade,' which means it



won't give off chemicals harmful to life in the pond. Avoid swimming pool-grade PVC or roofing formulations of EPDM which are toxic to fish. The liner should be UV-stabilized to resist ultraviolet sun damage. Pond liners are available in several thicknesses; however, experienced gardeners feel that 45 mil liners are worth the extra cost. Preformed pond shells offer a choice of shapes made of plastic or fiberglass. These are easily installed and last forever. Concrete block or inverted flowerpots serve as plant 'shelves' in larger containers.

## Plants in the Pond

Ponds in the wild flourish because they have developed their own sustainable ecosystems. In the garden, a mini-ecosystem must be established so that fish and plants can thrive. A balance of plants, creatures, and technology keep the pond essentially self-sustaining. It may take time to establish this balance. Seasonal or unforeseen changes may also disrupt the balance. If plants are the only component of the water feature, a water pump is unnecessary. If koi are introduced into the system, a pump is beneficial. Essentially, a pump circulates water through the pond system, passing it through a filter. The movement of water adds oxygen and helps keep it clean. Some water features that contain fish, such as gold fish, or snails may not require water circulation.

Principles for gardening in soil are the same as those for gardening in water. In a typical landscape, a number of different size and shaped plants are used to create diversity in the design. Water gardens have similar design requirements. Tall bog or border plants, such as canna, sedge (*Carex*), taro (*Colocasia esculenta*), and cattail (*Typha*), grow with their roots submerged and foliage above the water. These plants provide the same effect as trees and shrubs in the

landscape. Their size and height add structure and provide a backdrop for flowering plants.

Plants that prefer shallow water (about 6 inches) are placed on the shelves or margins of most ponds. Common marginal plants are calla lilies (*Zantedeschia aethiopica*), Japanese arrowhead (*Sagittaria japonica*), Nile grass (*Cyperus papyrus*), Siberian and Japanese iris (*Iris sibirica* and *I. ensata*), horsetails, (*Equisetum*), umbrella grass (*Cyperus alternifolius*), and water poppies (*Hydrocleys nymphoides*).

Submerged or oxygenating plants, such as Canadian pondweed or anacharis (*Elodea* or *Eyeria*), parrot's feather or water milfoil (*Myriophyllum aquaticum*), pondweeds (*Potamogeton*) and eel grass (*Vallisneria americana*), live underwater where they supply oxygen and compete with algae for nutrients.

Floating plants such as duckweed (*Lemna*), American lotus (*Nelumbo lutea*), water lettuce (*Pistia stratiotes*), water fern (*Salvinia rotundifolia*), and water hyacinth (*Eichhornia crassipes*) move freely on the water surface to provide algae-suppressing shade. They are not necessarily considered ornamental, but provide a necessary component of the water landscape. The ornamental water lily is also considered a floating plant, although roots are usually in a container. Some of these plants must never be introduced to streams or drainage ditches where they are considered invasive.

A number of nurseries in Utah carry a great selection of water plants and employees have a wealth of knowledge about the hardiness for particular areas of the state. Most floating plants are considered annuals in the northern end of the state, but may easily overwinter in Southern Utah.

The following table is an easy reference to pond plants:

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### Tall plants

canna  
sedge (*Carex*)  
taro (*Colocasia esculenta*)  
cattail (*Typha*)

### Marginal plants

calla lilies (*Zantedeschia aethiopica*)  
Japanese arrowhead (*Sagittaria japonica*)  
Nile grass (*Cyperus papyrus*)  
Siberian and Japanese iris (*Iris sibirica* and *I. ensata*)  
horsetails (*Equisetum*)  
umbrella grass (*Cyperus alternifolius*)  
water poppies (*Hydrocleys nymphoides*)

### Oxygenating plants

Canadian pondweed or anacharis (*Elodea* or *Eyeria*)  
parrot's feather/water milfoil (*Myriophyllum aquaticum*)  
pondweeds (*Potamogeton*)  
eel grass (*Vallisneria Americana*)

### Floating plants

duckweed (*Lemna*)  
American lotus (*Nelumbo lutea*)  
water lettuce (*Pistia stratiotes*)  
water fern (*Salvinia rotundifolia*)  
water hyacinth (*Eichhornia crassipes*)

## Setting up the Pond

Whenever fresh garden soil is turned and seeds planted, weeds immediately begin to grow. The same applies to water gardens. Initially, the pond should be filled with tap water and allowed to sit for several days in order for the chlorine to dissipate and the temperature to moderate. Plants may be introduced after this period of time.

At first, the water may become cloudy and turn green with suspended algae. A barley straw ball (must be barley straw) connected to the filter system may help with algae growth.

Most water plants are grown in pots. Generally, dwarf water lilies and submerged plants need pots about 6 inches in diameter and 6 inches deep. Most bog plants, full-sized lilies, and dwarf lotuses need pots at least 12 inches across and 6 inches deep.

When using plastic nursery pots or planting baskets made for water gardening, line the pot or basket with two layers of newspaper to keep the soil from filtering out. Water plants need heavy, humus-rich soil such as fertile garden soil or good commercial topsoil or a mix specifically for water plants. Never use potting soil that contains peat, perlite, or vermiculite. Once potted, cover the soil surface with ½ to 1 inch layer of rinsed pea gravel to hold the soil in the pot.

Fertilize plants twice a year – during spring pond clean-up and again in the summer, no later than the first of August. Repot mature pot-bound plants in early spring, fertilizing at the same time. Trim all old blossoms and yellow leaves during the growing season. This promotes more blossom production and keeps the pond tidy.

There are various formulas for stocking the pond with plants, fish, and other creatures. Generally, for every square yard of water surface, the following combination of fish and plants are suggested:

- 2 bunches of oxygenating or submerged plants
- 1 water lily or floating plant that covers 60-70% of the surface
- 1 or 2 bog or marginal plants for height (optional)
- 2 trap-door water snails to eat algae
- 2 or 3 mosquito fish, goldfish, or guppies (each 2" long) to eat insects

## Winter Care (*Nelumbo rotundifolia*)

water lily (Field lilies or water lilies), depending on the construction of the pond and the inclination of the gardener. Some nurseries allow gardeners to trade large fish in at the end of the summer for smaller fish the following season. To protect fish during long cold spells, a pond depth of 36-48" is required, and a portion of the pond's surface must remain open to allow gases to escape and oxygen to return to the water.

A heater designed for ponds is safe for use in concrete, lined, or even preformed ponds. They are preset to operate only when the water temperature approaches freezing. Heaters placed near the center of the pond reduce the chance of damaging the pond liner.

An airstone operated by a standard aquarium air pump may be enough to keep a small opening in the ice in milder weather. Ideally, it should be placed halfway up from the deepest part of the pond and should be frequently monitored. Water pumps are also used to provide an opening in the ice. Coarse intake prefilters must be used so that pieces of ice or debris don't clog the intake area.

A submersible pump works effectively when mounted over the deepest part of the pond, far enough from the surface that it doesn't freeze solid, and far enough from the bottom that it doesn't circulate the colder, lower layers of water. These devices need regular inspection for freezing and water content.

Before winterizing the pond, clean the pond of organic debris, including leaves and other wastes that continue to decompose over the winter. Replace about 10% of the water with fresh water. If a waterfall was installed with the pond, check to make sure the pump is operating correctly before winter.

In cold water, the fish naturally slow down and go into a hibernation-like state. The last few weeks of fall, fish eat in preparation for winter rest. When pond temperatures fall below 55°F the fish need easily digested foods, especially those made from wheat germ. Stop feeding fish when pond temperatures fall below 45°F, when they live off stored fat. Again in the spring, wheat germ provides an easily digested diet when water temperatures are between 45°F and 55°F. In summer months feed fish no more than what they can eat in 5-10 minutes several times a day.

If wintering fish outdoors is not possible, they may be moved indoors. This should be accomplished before the pond temperature reaches 55°F, to minimize any shock the fish may experience. Aquariums, small wading pools, or any large non-toxic container that holds water is adequate for overwintering fish. The container

needs to be as large as possible for the amount of fish, and covered to keep fish from jumping out. A filter and aerator are necessary; perhaps those used in the pond. Continue feeding fish throughout the winter months, but cut back if they are crowded in a small tank. A diet which includes carotenoids or spirulina (color enhancers) helps keep colors from fading under low light conditions.

When fish are removed from the pond, the outdoor pond should be left nearly full. Occasionally, plastic jugs, inner tubes or other containers are left floating on the surface to moderate the freezing and thawing cycle of pond water. Remove tubing used for water circulation and other plumbing fixtures before the first freeze.

## Sources:

Web sites:

[www.utahwatergarden.com](http://www.utahwatergarden.com)

[www.watergarden.com](http://www.watergarden.com)

Books and Magazines:

PondKeeper Magazine (814)695-4325,

[www.pondkeeper.com](http://www.pondkeeper.com)

American Horticultural Society Complete Guide to Water Gardening, by Peter Robinson (DK Press, 1997; \$35)

How to Build Ponds and Waterfalls, by Jeffrey Reid (\$12.95)

Water Gardening in Containers; Small Ponds, Indoors & Out, by C. Greg Speichert and Helen Nash (Sterling, 1996; \$25)

## Supplies:

Advanced Ponds 9132 So. 700 East, Sandy, UT  
(801)255-3698

Crystal Palace Perennials (219)374-9419

[www.crystalpalaceperennial.com](http://www.crystalpalaceperennial.com)

Desert Water Gardens [www.desertwatergardens.com](http://www.desertwatergardens.com)

Eagar Inc. 526 No. 700 West, North Salt Lake, UT  
(801)292-9017

Glover Nursery [www.glovernursery.com](http://www.glovernursery.com)

Lilypons Water Gardens (800)999-5459  
[www.lilypons.com](http://www.lilypons.com)

Wasatch Koi and Water Gardens [www.wasatchkoi.com](http://www.wasatchkoi.com)

Wasatch Shadows 9295 So. 255 West, Sandy, UT.  
(801)566-0608

Waters Edge Designs [www.watersedgedesigns.com](http://www.watersedgedesigns.com)

Willard Bay Gardens [www.willardbaygardens.com](http://www.willardbaygardens.com)

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