

# Slope, sunlight

## MAIN POND SUCCESS FACTORS

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**A** well-kept pond adds beauty to parks, golf courses, gardens and other green spaces. However, concern grows about potential runoff of nitrates and pesticides to surface waters such as ponds and streams.

Good construction techniques and pond best management practices (BMPs) keep landscape ponds attractive and clean.

### Construction & management

Three factors influence pond site selection—slope, nearby plant materials and sunlight. Avoid shady sites. They limit plant species. They also tend to attract leaf litter, tree roots and other landscape debris. Generally, it's easiest to build a pond on a level, lower location. However, with some extra effort, a pond can be built into a hillside. When a considerable amount of soil must be moved, consider letting it settle over a winter before beginning construction.

Once the site has been selected, outline

the desired size and shape on the ground. You can use spray paint. Be aware of how much sunlight the site will receive, and consider potential encroachment from nearby trees and shrubs over the next five-10 years.

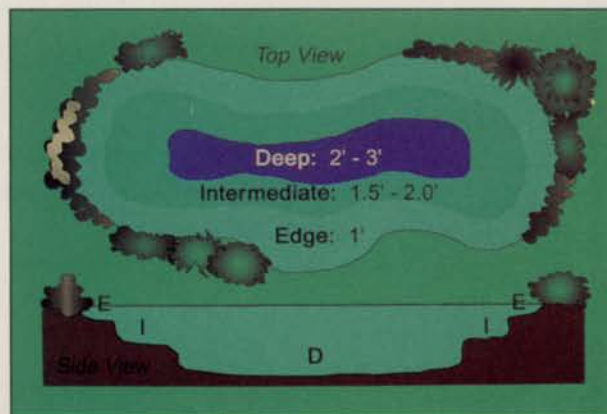
A pond should be as large as the landscape will allow. Most grounds managers indicate that users of a site prefer larger ponds. Larger ponds are easier to maintain, especially if they are to contain fish. Ponds 36 inches or deeper will usually support native plants and fish through winter. Ponds in northern states may require 48 inches or more, while those in southern states can be 24 to 36 inches deep.

### Depth and liners

Landscape ponds generally have areas of several depths. Ledge areas of up to one foot outline the pond and account for the

smallest square footage. Adjacent to this is an intermediate area of 1½ to 2 feet in depth. It can be two to three times wider than the first ledge. Most of the pond should be the deepest area, three feet deep. Shelves in the pond separate the levels, prevent plants from sliding down.

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There are several types of liners for ponds. Ponds larger than  $\frac{1}{4}$  acre are best sealed with bentonite. Smaller ponds can be quickly and easily made with pond liners. PVC liners are inexpensive, yet will rip easily and can be short lived. Hypalon liners are extremely strong, but difficult to handle and stretch. A liner made of an EPDM/Butyl blend that is 45 to 64 mil thick is best for intermediate-size pond construction.

#### **Plants provide oxygen, filter**

Plants can help keep a pond healthy. Submerged oxygen-generating plants are commonly overlooked, yet shade the bottom, harbor organisms, provide spawning habitat for fish, help filter the water, and decrease algal growth in addition to adding oxygen to the water. Submerged oxygenators include Vallisneria, Myriophyllum, Hornwort, and Potamogeton.

Marginal or edge plants beautify shallow areas. These add to the surroundings of the pond. Place tall edge plants such as cattails, palms, rushes, or sweet flag on the far sides opposite the viewing area. Use short, marginal plantings such as water iris, arrowheads, arum or swordplants along the near sides. Cattails and rushes are invasive. Confine the roots of these plants in containers or with rock borders. Hardy lilies, native to the area, can be very pleasing. These should be placed in the 3-foot depth areas.

#### **Pond BMPs**

Pond BMPs protect the surface water from potential pollution from fertilizer or pesticides. The threat is greatest during and following heavy rains. Too much nutrients in the pond will cause algal and other weed problems.

That's why ponds need buffer strips to trap potential pollutants. Obviously, the wider and denser the strip, the better it will keep pollutants from a pond. But, buffer strips have to be maintained too.

Research by Dr. James Baird, Oklahoma State University, indicates that mowing height affects the buffering capacity of a strip. Comparing  $\frac{1}{2}$ -inch, one-inch and three-inch heights of cut, Baird found that only the three-inch height effectively

reduced runoff and trapped nutrients and pesticides.

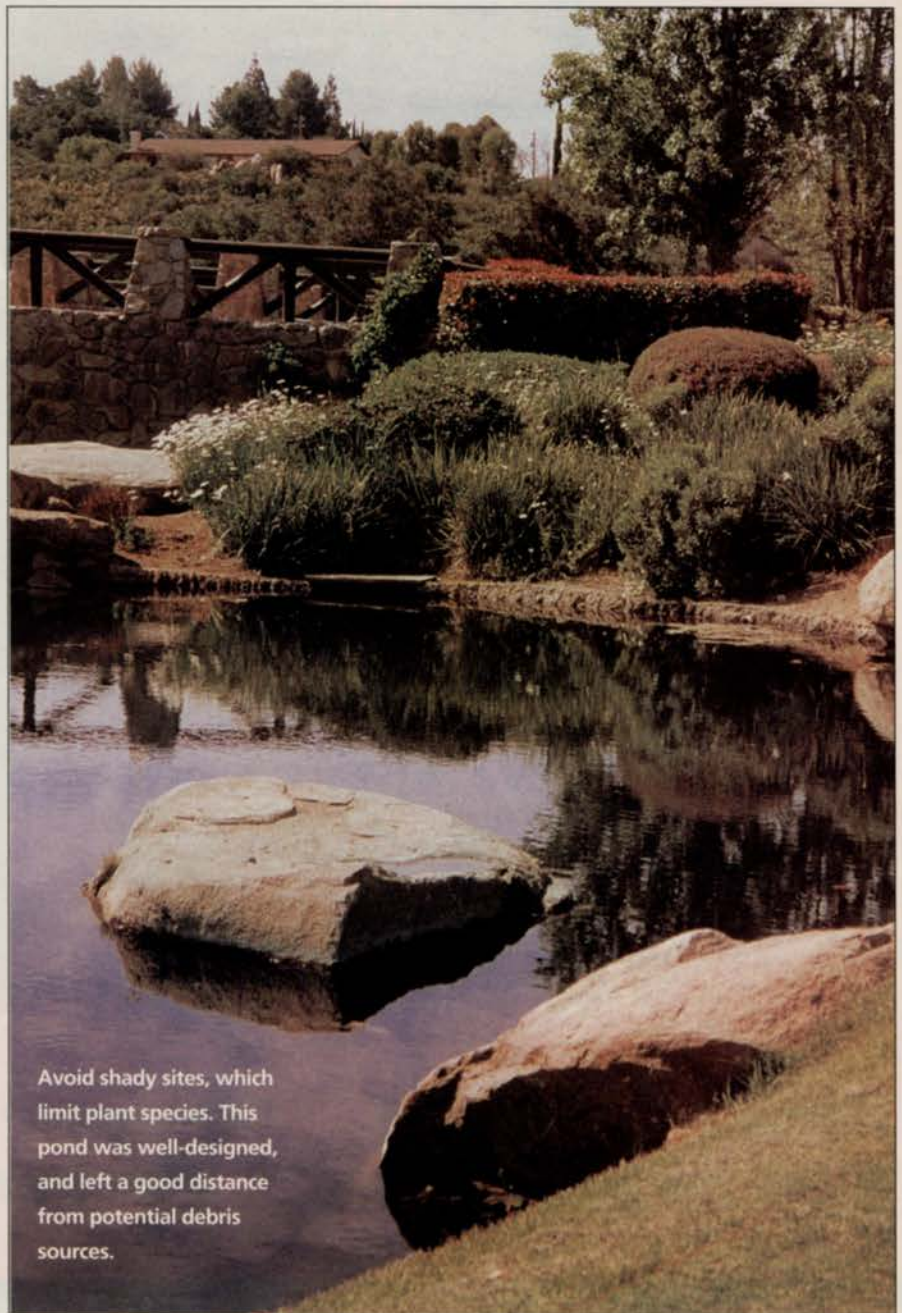
Also, stoloniferous and rhizomatous grasses prevent runoff better than bunch grasses. These grasses produce a thicker thatch and mat layer than bunch grasses.

Be aware that saturated soils have poor absorption characteristics. Applying fertilizers and pest control products under these conditions increases the potential for runoff.

Finally, the physical and chemical properties of the applied materials must be

evaluated. Consider the water solubility of a given pesticide. Formulations can vary widely in solubility, and can be chosen on this basis, especially near ponds. Consult fertilizer and pesticide manufacturers for solubility information. **LM**

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Avoid shady sites, which limit plant species. This pond was well-designed, and left a good distance from potential debris sources.