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**Aquatic Plants for Stormwater Ponds  
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As more of Florida's natural areas are being developed, the potential for flooding and water pollution is increasing. In order to reduce this potential, stormwater retention ponds are present in new residential and industrial developments. These ponds decrease downstream flooding and remove pollutants from stormwater runoff before it enters another water body or the groundwater system (SWFWMD, undated). In addition to these functions, stormwater ponds provide benefits such as an aesthetically attractive area, water storage for dry periods, and enhancing wildlife habitat (SWFWMD, undated). These benefits will not be gained, however, if stormwater ponds are not properly managed.

When stormwater ponds are not maintained, problems arise. One problem that can arise is soil accumulating in the pond due to erosion. This sedimentation fills the pond, physically smothers fish habitat, decreases the holding capacity of the pond, and reduces the efficiency for pollution treatment. Another problem that can occur is uncontrolled algal growth. Algal blooms occur when algae are provided with a stable food supply of nutrients such as nitrogen and phosphorus, which are found in fertilizer. As the algae grow, they can overpopulate a stormwater pond and cause surface scum, green turbid water, and low dissolved oxygen levels. Ponds with these characteristics require treatment to get them back to operating efficiently and become aesthetically pleasing.

Ponds with sedimentation and algae problems are commonly dealt with physically and chemically. In order to lessen the effects of sedimentation, sediment can be removed from stormwater ponds. However, removed sediments are considered contaminated and should be disposed of appropriately (SWFWMD, undated). To combat algae, algaecides are commonly used. Nevertheless, incorrect and continued use may result in additional problems in the stormwater pond. Improper use of algaecides may result in a decrease in dissolved oxygen levels in the water when too large of the pond volume is treated with the chemical. As the algae die, dissolved oxygen is used in the decaying process, and the level of dissolved oxygen in the water is reduced to levels that may not be able to sustain fish populations (Thayer et al., 1996). Algae also may develop a resistance to compounds that have been consistently used to treat algae blooms.

**Not All Aquatic Plants Are Bad**

Although these maintenance practices can be satisfactory when used properly, there are biological controls that reduce the necessity of their use and help the pond be more efficient in reducing water pollution and holding stormwater. By properly landscaping the pond's banks and shallow areas with desirable aquatic and wetland plants (known as aquascaping), the amount of sediment, nutrients, and pesticides flowing into the pond are decreased. The plants help to stabilize the banks, which prevents erosion, and filters soil out of stormwater runoff. Aquascaping also reduces the amount of algae present in the pond because the plants help take up excess nutrients from stormwater runoff. In addition, the plants provide shade in the pond, which helps prevent algae

growth. Pesticides are also filtered out of stormwater runoff by the aquatic plants, and this action helps improve the pond's water quality. Finally, an indirect benefit of aquascaping is that the pond is made aesthetically pleasing to both people and wildlife. For more information on which plants are recommended and those that should be avoided in aquascaping, see Tables 1 and 2, respectively.

### **Do Your Research**

Before embarking on aquascaping, it is important to determine if this action can be done legally. Some types of stormwater ponds have a Stormwater Discharge permit, which contains specific maintenance instructions. In order to determine if your pond has a permit, research about the pond should be done. First, establish the ownership of the pond, if there is a Stormwater Discharge permit, and if a drainage easement covers the pond. Then, determine who is specified to conduct maintenance of the pond. Next, check the approved construction plans, subdivision documents, and the Stormwater Discharge permit to find out if there are restrictions on stormwater pond maintenance. Finally, contact the local water management district to verify your findings and for additional stormwater pond maintenance guidance (SWFWMD, undated).

### **Don't Ignore the Aquatic Plants**

Once aquatic plants are established in and around a stormwater pond, they require maintenance just like lawns. Unfavorable plant species can inhabit the pond, and vegetation can become uncontrollable if the pond is left unmanaged. When this situation occurs, getting the pond vegetation back to a manageable level can be difficult. In addition, an unmanaged pond can have problems with drainage and mosquito production. With frequent attention to potential problems, the vegetation can be easily managed. The following practices are commonly used to manage aquatic plants: modifying landscape practices surrounding the pond, hand removal of plants, plant-eating fish, and herbicides. With the proper selection of aquatic plants, maintenance can be kept at a manageable level. Reputable pond management companies can assist with most vegetation management.

Although many people find it desirable to live along a waterbody, it is important to remember that the stormwater pond has a purpose in communities. Our actions and landscape practices can either help or hinder the stormwater pond from decreasing flooding potential, storing water, and filtering pollutants. By learning about stormwater ponds and planting appropriate aquatic plants, the efficiency of the pond can be sustained and the need for physical and chemical treatments can be reduced.

Table 1: Plants that are found in stormwater ponds and natural waterways (Butts et al., 1997; Ramey, 2000; Schaefer et al., 2001; SJRWMD, 2002).

Common Name	Scientific Name	Comments
<b>Low Maintenance<sup>1</sup></b>		
American white water lily	<i>Nymphaea odorata</i>	Deep-water plant; up to 8 ft water depth. Reproduces by seed and rhizome roots. Leaves 1 to 2 ft wide. Blooms spring through the fall with white or yellow flowers.
Arrowhead	<i>Sagittaria latifolia</i>	Shallow water plant. Showy white flowers year round. Reproduces by seed or rhizome. Seeds and tubers are valuable food source for wildlife.
Blue flag iris	<i>Iris virginica</i>	Emerald plant. Pale blue flowers. Medium size plants grow to 4 ft tall.
Softstem bulrush	<i>Scirpus tabernaemontani</i>	Emerald sedge. Grows up to 10 ft tall into large colonies
Duck potato	<i>Sagittaria lancifolia</i>	Emerald plant. Showy white flowers and large leaves.
Giant bulrush	<i>Scirpus californicus</i>	Shallow water plant. Grows to 10 ft. Can spread into deep water
Golden canna	<i>Canna flaccida</i>	Showy and grow to 4 ft tall at edges of ponds.
Gulf Coast spikerush	<i>Eleocharis cellulosa</i>	Attractive light green upright stems. Dense growth habit shown to hinder weed growth.
Pickerelweed	<i>Pontederia cordata</i>	Shallow water plant. Blue flowers that bloom most of year. Reproduces by seeds and rhizomes
Pondweed	<i>Sagittaria stagnorum</i>	
Soft rush	<i>Juncus effusus</i>	Perennial that is 1 to 5 ft tall. Attractive flowers. Reproduces by seed or division.
St. John's wort	<i>Hypericum perforatum</i>	Shoreline small evergreen shrub. Grows 3 to 8 ft. Endures intermittent flooding
Tape or eelgrass	<i>Vallisneria americana</i>	Submersed plant. Spread by runners.

Common Name	Scientific Name	Comments
<b>High Maintenance<sup>2</sup></b>		
Bladderwort	<i>Utricularia sp.</i>	Submersed free-floating plant. Sizes range from inches to several feet long.
Coontail	<i>Ceratophyllum demersum</i>	Submersed plant that is free-floating.
Knotweed	<i>Polygonum sp.</i>	Emersed plant
Mosquito fern	<i>Azolla sp.</i>	
Paragrass	<i>Urochloa mutica</i>	
Pennywort	<i>Hydrocotyle sp.</i>	
Sedge	<i>Cyperus sp.</i>	
Southern naiad	<i>Najas guadalupensis</i>	Submersed plant.
Spatterdock	<i>Nuphar lutea</i>	Deep-water plant; up to 15 ft water depth. Spreads rapidly by seed or rhizomes. May become a nuisance.
Wild taro	<i>Colocasia esculenta</i>	Emersed plant. Non-native. Leaf stems grow to 4 ft tall.

<sup>1</sup> Low maintenance is defined as plants that grow slowly and require little maintenance. These plants are desirable for aquascaping.

<sup>2</sup> High maintenance is defined as plants that grow quickly and require a lot of attention.

Table 2: Plants that are either prohibited by law or should be avoided due to their invasive and noxious nature (Butts et al., 1997; SJRWMD, 2002).

Common Name	Scientific Name	Comments
Alligator weed	<i>Alternanthera philoxeroides</i>	Prohibited <sup>1</sup>
Bog-mat	<i>Wolffiella spp.</i>	Extremely invasive
Cattail	<i>Typha sp.</i>	Extremely invasive. Crowds out other plants.
Duckweed	<i>Spirodela polyrhiza</i>	Extremely invasive. Completely obstructs all other plants.
Eurasian water-milfoil	<i>Myriophyllum spicatum</i>	Prohibited <sup>1</sup>
Hydrilla	<i>Hydrilla verticillata</i>	Prohibited <sup>1</sup> . Number one aquatic weed problem in the southeast.
Spikerush	<i>Eleocharis sp.</i>	Very difficult to control and unsightly.
Torpedograss	<i>Panicum repens</i>	Crowds out other plants. Very difficult to control.
Waterhyacinth	<i>Eichhornia crassipes</i>	Prohibited <sup>1</sup> . Introduced plant that can completely cover a pond's surface.
Waterlettuce	<i>Pistia stratiotes</i>	Prohibited <sup>1</sup> . Can completely cover the surface of quiet or slow moving water.
Water-meal	<i>Wolffia spp.</i>	Forms solid layer on water surface.
Water fern	<i>Salvinia minima</i>	Can completely cover a pond's surface.
Water spinach	<i>Ipomoea aquatica</i>	Prohibited <sup>1</sup>

<sup>1</sup> Prohibited plants are aggressive weeds restricted by state or federal law. These plants may not be possessed, transported, cultivated, or imported without a special permit (SJRWMD, 2002).

For more information on these aquatic plants, contact your county extension service office.

## References

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