

Recommended Maintenance for Wet Ponds in the City of Austin

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Wet ponds are water quality ponds that have a permanent pool of water. They are designed to capture and hold stormwater runoff to allow settling of suspended solids and removal of pollutants. The following recommendations expand on the maintenance criteria for wet ponds found in the City of Austin Environmental Criteria Manual, section 1.6.3. Design criteria for wet ponds are located in section 1.6.6 of the same document. Owners of a wet pond are required to carry out both short-term and long-term maintenance tasks.

- 1) **Landscape management:** Maintain a clean and attractive appearance to the wetland and adjacent landscape at all times.
 - a) Remove excess debris and litter on a regular basis (minimum every 3 months) from the pond area. Areas needing attention include pond side slopes, the water's edge, the pond inlet and outlet.
 - b) Maintain turf adjacent to the pond at regular intervals so that the height does not exceed 6". Mow at least 4 times a year to prevent woody growth and control weeds. Mowing more often may be required during periods of warm temperatures and high rainfall.
 - c) Exercise caution when using landscape or lawn chemicals in areas that drain to the wet pond. If weeds are a problem, manual removal is recommended. If herbicides are necessary, they should be used to spot-treat weeds, and never broadcast throughout the landscape (e.g. 'weed & feed'). A thick, well-maintained turf is the best approach to minimizing lawn weeds.
 - d) Prevent and control erosion at the pond slopes and embankment. Accumulation of sediment in the pond is the primary reason the pond will require intensive maintenance (See 4.b this document). Corrective measures such as regrading and revegetation will be necessary if erosion occurs.
- 2) **Pest management:** A 'least-toxic' approach should be used to treat pest infestations. This management method is often called integrated pest management, or IPM.
 - a) Remove invasive woody trees, such as Willows, that typically colonize the perimeter of the pond. These should be removed to prevent any potential future impact on the pond liner. Refer to the Table 1 for woody plants that often invade ponds. If the trees are small, physical removal by the roots is the desired treatment method. A tool called a tree wrench (or weed wrench) is an effective way to remove small trees without the use of chemicals. This tool is most effective when there is a hard surface against which the operator can gain leverage. Using some type of support in wet soils will help.
 - i) If physical removal of weed trees is impractical a herbicide may be necessary. To minimize the amount of chemical needed, cut off the top of the tree and treat the stump to prevent re-sprouting. 'Brush-B-Gone', Roundup, or similar products are sometimes used. In all cases, the herbicide shall contact the weeds only, and shall not impact adjacent desirable vegetation or contact nearby water.
 - ii) Do not use an herbicide if rainfall is expected within 48 hours, or if wind speed is greater than 8 miles per hour.

Table 1. – Woody Plant Weed List

Common Name	Botanical Name	Weed Type
Ash	Fraxinus spp.	Pond-edge tree
Chinaberry	Melia azedarach	Pond-edge tree
Chinese Tallow	Sapium sebiferum	Pond-edge tree
Cottonwood	Populus deltoides	Pond-edge tree
Giant Cane	Arundo donax	Tall woody grass
Mulberry	Morus spp.	Pond-edge tree
Poison Ivy	Toxicodendron radicans	Woody vine
Rough-leaf Dogwood	Cornus Drummondii	Pond-edge tree
Willow	Salix nigra	Pond-edge tree

- b) The presence of algae in wet ponds is to be expected, however excessive algae growth should be managed. There should be a minimal use of fertilizers in the pond's drainage area, since stormwater runoff may transport the nutrients to the pond. Excess use of fertilizers will result in an overgrowth of algae. It is preferable that excess algae be removed through physical or manual methods. There are several practices that may help to minimize the growth of algae:
 - i) Algae growth may be minimized if the pond is well aerated. Aeration can be achieved through mechanical as well as biological methods. Fountains and underwater bubblers will not only oxygenate the water, they can physically break up algae growth as well. The use of submergent (underwater) plants is a low-cost natural way to aerate the pond.
 - ii) Shade helps to minimize algae growth. The use of floating-leaved plants (e.g. water lilies, etc.) can provide some shade. Be careful not to over-use these plants, since they spread quickly and may have undesirable aesthetic impacts.
 - iii) Consider using a microbial pond clarifier to achieve the desired results. These microbes are naturally occurring bacteria that break down organic matter and nutrients in the pond. They work best as a preventive technique for minimizing algal growth. An internet search is a good way to determine where such products are available. An herbicide shall not be used to treat excess algae.
 - c) Invasive aquatic plants, such as water hyacinth (*Eichornia crassipes*), must be removed if they appear. Cattails (*Typha* spp.) tend to invade most local wet ponds and aggressively colonize shallow water areas. While cattails are beneficial for water quality, an overabundance of the plants can be unhealthy for a pond; thus excessive quantities of cattail should be removed.
 - d) Mosquitoes are usually not a problem with wet ponds due to the presence of mosquito fish (*Gambusia affinis*). Mosquito fish are efficient predators of mosquito larvae, and are a requirement in wet ponds within the City of Austin. If mosquitoes become a problem on-site, survey the area for standing water where fish are not present. The use of a product with the active ingredient *Bacillus thuringiensis*, or B.t. (e.g. 'Mosquito Dunks') is a natural, although temporary, way to treat water for mosquito larvae.
 - e) Domestic waterfowl, such as ducks and geese, can destroy vegetation and increase pollutant loading in the pond and thus should not be introduced.
 - f) Fire ant infestations around a wet pond should be managed through the application of a bait insecticide. Treat only when fire ants are present.
- 3) **Water and pool management:** The pond shall remain at, or near, the permanent pool elevation, at all times throughout the year.
- a) Exercise care with the pond liner, which must remain intact for the pond to work correctly. Prevent tree roots, excavation or other elements from threatening the integrity of the liner.
 - b) If an extended drought causes excessive water loss in the pond, then water should be added to raise the level to the design elevation. This water is called 'make-up' water. If the make-up water is chlorinated then it should be added very slowly to allow dissipation and avoid high chlorine levels in the pond.
- 4) **Long-term maintenance:** Major maintenance is required infrequently, but is necessary for pond longevity and health.
- a) Structural repairs and replacement may be necessary as the pond ages. Pipes, including the inlet, outlet, and inter-basin pipe, may deteriorate over time. Inspect the following on an annual basis:
 - i) Inspect the pond side slopes for erosion
 - ii) Inspect all structural elements for damage and repair if necessary.
 - b) Remove sediment from the pond when sediment accumulation significantly reduces the storage capacity. Remove sediment if accumulation impairs functioning of the inlet or outlet structure.
 - i) The accumulation of sediment in the sediment forebay should be checked every three years. Remove the sediment if more than one-third of the forebay volume is lost.
 - ii) Check the sediment accumulation in the main pool every six years, and remove when 20% of the volume is lost.