FACT SHEET – PONDS

Introduction

One of the most rewarding methods of increasing the value and visual appeal of property is to create an earth pond. In backyards, ponds can provide hours of enjoyment and relaxation. In fields with poor drainage and low productivity, pond construction is an attractive alternative to agricultural cultivation.

Depending on its size, a well designed pond can serve many purposes. Ponds can:

- serve as an irrigation source for crops, livestock, gardens, and tree plantations
- serve as a source for recreational activities such as wildlife watching, photography, swimming, fishing and skating
- serve as an emergency source of water in the event of a fire
- enhance of the natural environment, benefiting wildlife and the quality of human life
- recharge groundwater for wells
- retain sediment normally lost through erosion
- store and moderate floodwaters

Site Preparation and Planning

1) Identify the intended function or primary use of the final product.
2) Design the pond
    a) If a major requirement is water holding capacity and minimizing land use, then a deep, steep-sided, regular shaped structure is best suited. The drawback of this type of conventional pond is that it adds little financial or aesthetic value to the property. It also fails to provide substantial wildlife habitat and can be fairly dangerous.
    b) A more creative pond design is better suited to sustain and attract wildlife. More creative characteristics include gently sloping sides, areas of shallow water, irregular shapes, and rock and earth islands to lure nesting waterfowl. These ponds can also be used for irrigation, but remember that extreme water level fluctuations reduce the ability of native species to establish themselves.
    c) Once the appropriate location is chosen a sketch of the pond, including planting ideas, slopes, adjacent land uses, woodlots, etc., should be drawn. For wildlife watching, an elevated observation area at the deep, steeper sided section of the pond is suggested as there is less vegetation to interfere with viewing or photographing. A sand layer added to the shore and underwater slope in this area can increase the suitability for swimming as well. A layer of sand or beach pebbles can also help to maintain water quality.

3) Determine possible sites for the pond.

   a) Ideally, the site will be the lowest point of land on the property, such as a swampy area with poor crop production.

   b) Keep the intended uses of the pond in mind and situate accordingly. For abundant wildlife, the site could be adjacent to woodlots, shrublands, unmown grasslands or other natural areas. The greater the area and variety of connected natural habitat, the greater the utilization by wild plants and animals. Small, disconnected areas of natural habitat require animals to cross fields, roads and yards, posing obvious threats to the animals as well as increasing the risk of crop or other property damage. Having one continuous area for uncontrolled vegetation also helps keep unwanted seed migration into crops and gardens at a minimum.

   c) When locating a site, double check lot lines, property deeds, location of overhead or underground lines and local bylaws requiring fencing or permits. Currently, permits from ERCA are necessary before damming watercourses or creating a pond on a lakeshore or flood plain.

   d) The pond should be located away from manure and chemical contamination sources such as runoff areas from pastures or treated fields and lawns.

   e) To hold water, the pond bottom and sides should be lined with clay or fine sand with 20% or more clay content. Gravel, limestone, coarse sand and other porous soils will need a packed clay lining unless the water table is at or near the ground surface. Use an auger to get soil samples at the proposed site. For smaller ponds, an artificial liner such as plastic could also be used.

Construction Guidelines

1) Dig a test pit.

A test pit within the pond site should be dug prior to actual construction. This will allow for a re-test of clay content of questionable soils, and will help determine the pond's water holding capability. A test pit will also indicate the expected water level. This is a good time to check calculations to ensure that the pond will be large enough for its intended purpose.

2) Outline the perimeter of the pond.

Once a sketch of the pond has been made, the actual perimeter should be outlined using stakes. Brush, trees, logs and moveable rocks should be cleared from the area. Natural debris can be saved to create shoreline brush piles for rabbits, pheasants, and other wildlife. Rocks and logs can be placed along the shore and in the water to create wildlife habitat. Submerged rocks and logs provide habitat for dragonfly and other insect larvae and contribute to a balanced ecosystem; partially submerged logs provide basking areas for turtles and frogs, and hunting posts for birds. Remember, in the natural world, variety is the spice of life.

3) Dig the pond.

   a) When the actual digging has begun, the topsoil (top 12 inches) should be scraped off and saved for covering the shore, banks and bottom of the pond. This will greatly accelerate the establishment of vegetation and the accompanying wildlife.

   b) Pond banks and slopes should be dug at gentle but varying grades. Ideally, at least half of the pond area should have a water depth of 3 feet or less, with a deep section of 6 to 8 feet suitable for swimming. Shallow areas allow for healthy vegetation growth and warm summer water for aquatic animals. Deep areas provide cooler summer water and warmer winter water necessary for the survival of fish and other animals. Islands surrounded by water with depths of 3 or more feet provide nesting waterfowl with protection from predators such as dogs, cats, raccoons and skunks. Remember to dig the overflow spillway before the final landscaping has been finished.

Plantings and Enhancement

- Native trees, shrubs, grasses, wildflowers and aquatic plants provide food, shelter and nesting areas for many wildlife species. To attract and sustain abundant wildlife, these native plants should be added in and around the pond. Native plants are those that originated in the Essex Region, not in Europe or other areas, and thus are well adapted to local conditions. They are available at local nurseries, conservation agencies, and from hobby growers. ERCA's tree planting program focuses on providing locally native species, the Essex County Field Naturalists collect and sell native seeds, and many growers and nurseries carry "Naturally Essex" trees and shrubs.

- Cattail, Arrowhead, Duckweed and other common aquatic plants reproduce rapidly, and can be transplanted from roadside ditches to the pond site where they will establish themselves quickly. Theses aquatic plants provide food for birds and other mammals, and provide shelter for fish and frogs.

- Wet shore and bank areas can be randomly planted with native shrubs such as American Elderberry, Nannyberry, Pussy Willow, Buttonbush, Staghorn Sumac, Spicebush, Marsh Rose and Red Osier Dogwood. In slightly drier shore areas, Rough-leaved Dogwood, Purple Flowering Raspberry, Choke Cherry, Fragrant Sumac, Staghorn Sumac, Prairie Rose, Bladdernut, Prickly Ash, and native Hawthorn species can be planted.

- Areas farther from the pond can be planted with native tree species. Trees suited to moist wet areas are Burr Oak, White Oak, Red Ash, Black Ash, Pumpkin Ash, Sycamore, Pin Oak, Big Shellbark Hickory, Kentucky Coffeetree, White Elm, Black Willow, Red Maple and Silver Maple. Trees should be planted farther away on the southern side of the pond than on the northern side so as not to reduce pond water temperature through shading, which will decrease the pond's wildlife diversity and productivity. Dead timber should be left standing as this will provide habitat and nesting areas for creatures such as woodpeckers.

- Plantings from fencerows, ditches and other natural areas slated for development can be saved and transplanted to the pond site. However, plants should not be taken from these natural areas unless they are slated for immediate destruction, and permission from the property owner has been granted. Plantings should be transplanted in areas around the pond that are similar to their original environment.
- Exotic or non-native plants provide little or no value to wildlife as a food source and can lead to the loss of native plants and animals due to their aggressive nature. Watch for the invasion of Purple Loosestrife (a European plant species) as it will eventually choke out other pond and shore vegetation, and it does not provide a food source for wildlife. If Purple Loosestrife does invade, the best control method is to hand pull the plants in the early flowering stage before seeds are produced. These pulled plants should then be hung or placed in a manner which will cause them to dry out quickly before any viable seeds can be produced. Be persistent, as one broken root sprout can regrow and mature to produce several million seeds in one growing season.
- Grasses should be encouraged to grow as they hold soil and produce abundant food supplies for many species. Mowing should be limited to observation posts and trails, and should be avoided around the pond and natural areas as it disturbs and destroys wildlife.
- The use of herbicides, pesticides and fertilizers should be avoided, especially in areas where surface runoff enters the pond. These chemicals upset natural ecosystems, and can cause problems like excessive algae growth in pond water.
- If fishing is intended, then bullhead, sunfish, bluegill and perch are recommended. Carp and goldfish should be avoided as they cause muddy water by stirring pond sediments, which destroys aquatic vegetation. Bass species should also be avoided as they are predators of most other wildlife in the pond. Domestic cats and dogs should be discouraged and restricted from the pond area as they harass and kill pond wildlife. Domestic waterfowl should be restricted from the pond as well as they foul pond water and destroy vegetation.
- Birdhouses for both upland and waterfowl species are very successful around ponds, while waterfowl nesting structures and houses can be placed on poles in the pond to protect them from predators. Nest box and structure designs can be obtained for virtually any species from ERCA. Nature stores often stock good books for birdhouse building ideas, preferred habitats and habitat improvement projects.

Aftercare and Long-term Management

The pond should transform into a lively wetland after several years of natural succession, possibly becoming a home to rabbits, deer, muskrats, bats, mink, turtles, toads, snakes, crayfish, fish, geese, ducks, herons, butterflies, etc. If species diversity is still low after several years, water level fluctuations may need to be monitored. Flooding may be remedied by resizing spillways, and low water levels may be increased by finding additional water sources such as old wells. Contamination from fertilizers or other chemicals may also be a problem. If excessive algae growth is evident, it can be controlled by Cattails and other plants once they start growing. The addition of other aquatic plants and shoreline vegetation, and the reduction of erosion and nutrient rich runoff will help alleviate the problem if it persists.

Each species that inhabits the pond and surrounding area has a specific function in the pond ecosystem. Dragonflies, birds, bats, frogs, and fish all eat mosquitoes and other insects, and they in turn are preyed upon by other species in the food chain. A well designed pond can provide years of ever changing enjoyment and wildlife habitat.

Contact ERCA for more information on ponds or species native to the Essex Region.