

Pond features:

- Shelf around edge of pond: @ 1' wide and 10-12" deep. Center of pond is level and @ 18" deep – at this depth the water does not freeze and it is here at the bottom of the pond in the accumulated gunk where dragonfly nymphs and frogs winter safely.
- My own wildlife ponds are trouble-free, preformed, kidney shaped ponds: 5' x 7' at widest, with built-in shelf and deeper center. They are lightweight, molded semi-rigid and made of high density polyethelene

Bog Garden:

Consider creating a shallow “Bog Garden” / overflow area off to the side of the main pond, using a pond liner. This is the perfect place for wetland plants: Cardinal Flower, Swamp Milkweed, Turk’s-cap Lily, Joe-pye-weed, etc.

Placement – IN SUN:

- Most pond dragonflies need direct sun to help regulate their body temperatures
- A pond in the sun will be less attractive to mosquitoes
- Fewer leaves will fall into a pond in a sunny area (i.e. not in under trees)

The #1 Question When Teaching This Workshop: “Won’t the pond breed / produce MOSQUITOES?”

- If you have a fish-free pond, dragonflies will breed and lay their eggs in it. Dragonfly nymphs (early life stage of dragonflies) are pond dwellers; they are the sharks of the pond world and feast on mosquito larvae.
- Mosquito larvae need to breath air and can be seen on the pond surface, so you can readily see if your pond is breeding mosquitoes. Most ponds attract egg-laying dragonflies the day they’re filled (in warm months, when dragonflies are flying).

NO FISH: Many amphibians (frogs, toads, salamander) seek vernal ponds for breeding. Vernal ponds (because they are dry part of the year) can not / do not support fish. You want your wildlife pond to be similar to this safe breeding site by not introducing fish to your pond. Too, most fish offered at garden centers are expensive, non-native Koi, etc. Fish eat dragonfly nymphs and amphibian eggs and young so it’s counterintuitive to add fish to a wildlife pond.

NO NEED to aerate water (aeration only needed for fish) – ponds in the wild are still water (not aerated). Certain dragonflies lay their eggs in still water. Others lay eggs in streams and will use a pond with moving water.

Emergent Vegetation is very important

- It is used as: (1) perch sites for dragonflies and frogs, (2) egg-laying sites for dragonflies and damselflies, (3) exit route for emerging dragonflies as they crawl up it and emerge from their **EXUVIAE** as a winged adult.
- Use **NATIVE PLANTS ONLY:** Pickerelweed & Fragrant White Water-Lily
- **NO cattail** – roots can completely fill in a pond
- **NO duckweed** – can completely cover pond surface in very short time. Once duckweed is in a pond it is nearly impossible to get rid of it. *Be very cautious*, since many garden centers see no problem selling Pickerelweed or Fragrant White Water-Lily covered in duckweed. Fish eat duckweed, so most fish-pond owners don’t see duckweed as a problem
- **NO Water Lettuce, NO Water Hyacinth, NO Parrot Feather** (non-native, invasive plants); if you have these plants, **NEVER** toss them into a natural wetland (instead let them die in a closed trash can sitting in the sun).
- **Place just a few pond plants in your pond:** I put only 1-2 Pickerelweed and 1 Fragrant White Water-Lily plant in each of my ponds. Place each plant in a large, empty (no soil needed) plastic, plant pot; then add a brick to weigh down the roots so the plant does not float to the surface; then sink the pot in the deepest part of your pond. Each plant will send out many leaves and flowers and soon reach the pond’s surface and provide for your pond visitors immediately. Every 2-3 years you’ll need to thin your pond plants because they explode with growth and can fill your pond (believe it!). By year 3 the task may be back breaking! You **DO NOT** want the pond surface covered by plant material because then it will not be attractive to egg-laying dragonflies.

Extra perches

- Strategically place a many-tonged branch overhanging the pond for perching dragonflies
- Add a log to the pond for basking frogs and turtles, and for easy exit for Box Turtles and other wildlife that may visit your pond but not live in it.

Pond Maintenance is minimal !

- Emergent vegetation needs to be thinned when it begins to cover the pond surface (and shared with friends who are considering putting in a wildlife pond), otherwise dragonflies and damselflies can no longer use the pond for egg-laying. You may want to thin pond plants every 2 years (in early spring before the roots send up new growth), since by year 3 the task can be back breaking.
- Add water when water level drops due to evaporation during rainless, hot summer stretches.

NO NEED to clean out your pond

- Natural ponds in the wild are never cleaned out
- Pond plants die back in winter to their roots and contribute to important gunk in the bottom of your pond – frogs, dragonfly & damselfly nymphs, and other aquatic insects safely winter in this gunk at the bottom of the pond at the deepest point, below where the water freezes
- Pond plants send out new growth in spring from their roots.

Allow one year for pond to stabilize naturally: Algae growth or cloudy water should clear up after a year. Putting in chemicals will keep pond from stabilizing on its own.

PERSISTENT ALGAE PROBLEMS

- If you follow this fact sheet and choose a sunny site (not under trees) for your pond, algae should not be a persistent problem.
- If algae is a persistent problem, you may have some of the following things contributing to it:
 - Bird droppings due to using a bubbler in winter months, where your pond is the only open water and many, many birds are using it as a water source and their droppings are accumulating in the pond – you might instead consider purchasing a heated birdbath.
 - Runoff from a neighbor's highly treated property (fertilizer regime) may be reaching your pond. Build a berm between the two to keep this runoff out of your pond.
 - You placed your pond too close to or under trees and the accumulated leaves in the pond are creating phosphorous overload which is fueling string algae growth.
- Salvatore Mangiafico, County Agricultural Agent at the Rutgers Cooperative Extension of Salem County, NJ suggests the following: rake out the algae and dead leaves with a leaf rake or by hand. You might also consider flushing the pond with a large percentage of clean water to wash away a lot of the old phosphorus-rich pond water. You could try using beneficial bacteria (Biosphere Pro) and / or Barley Straw from KLM Solutions (<http://www.pondalgaeolutions.com/>), though barley straw is more effective against green soupy algae (rather than string algae). Here are some additional resources to help you understand the problem:
 - “What’s Polluting our Rivers, Lakes, and Estuaries 1: PHOSPHORUS”
<http://njaes.rutgers.edu/pubs/publication.asp?pid=FS1170>
 - “Pond and Lake Management Part I: Dealing with Aquatic Plants and Algal Blooms”
<http://njaes.rutgers.edu/pubs/publication.asp?pid=FS1076>
 - “Pond and Lake Management Part VI: Using Barley Straw to Control Algae”
<https://njaes.rutgers.edu/fs1171/>
 - “Pond and Lake Management Part III: Controlling Geese and Other Pests”
<http://njaes.rutgers.edu/pubs/publication.asp?pid=FS1078>