Inflow from streams and agricultural drains. Even the purest-looking stream water will usually bring in excessive phosphorus and flush out little. Water from tiled fields and other wetland drainage tends to be especially rich in phosphorus. Do not use streams or drains as source-water for ponds, and locate ponds where they won't be flooded by high water from streams.

Tree leaves can be a massive source of phosphorus. Don't have trees so close as to shed leaves into the pond.

Crop and lawn fertilizers. Apply these sparingly and at times and in ways that reduce their loss in runoff. Use little or no fertilizer on land draining toward the pond. Use mainly nitrogen (Table 10-1) not phosphorus unless soil tests show it is needed, which is seldom the case. Rather than bluegrass, use fescue which needs less fertilizer and water. To promote healthy turf that needs less fertilizer and retains it better, keep it raked free of leaves, set mowing height at 2 to 2½ inches, and water sparingly, especially on sandy soil for less nutrient leaching.

Livestock wastes. Runoff from feedlots, barnyards and pastures should obviously be avoided.

Human wastes. Septic systems eventually leak phosphorus through the ground for distances as great as 300 or 400 feet in many Michigan situations—farther if the soil is shallow or the effluent seeps out of the ground and runs over land. Soils around septic systems become saturated with phosphorus and no longer remove it from the effluent. The better your soil passes the "percolation test," the more rapidly it may become saturated with phosphorus and let it through to your pond.

There are various ways to reduce or prevent escape of phosphorus from septic systems to pond. Locate the tank and/or drain field at least 300 feet away from the pond and in suitable soils at proper depth and on a slope not too steep. Add a dosage chamber to the septic system—and maintain it. Use no phosphate detergents or other phosphate cleansers. This reduces phosphorus content of septic effluent. No matter how septic systems are maintained, those closer than 300 or 400 feet to a pond probably won't be good for the pond. Some better method than septic systems should be used.

Consider alternative methods of waste disposal, such as composting toilets, other kinds of self-contained on-site sewage systems, municipal sewer hookup, or simply the traditional outhouse privy. Compost kitchen wastes rather than flushing them down a disposal grinder. Pour dishwater on your garden, lawn or angleworm-rearing bed rather than wasting it down the drain.

Pond Fertilization

Fertilizing a Michigan pond can do great damage if you wish to maintain it as a pleasant recreational fishery. Recommendations for fertilizing commercial or recreational ponds in southern states are sometimes applied in the North with unfortunate results. Fertilizer is used to increase southern fish production, also to create algal murk so dense that rooted plants are shaded out. But in regions of significant ice cover, this almost assures winter kill of fish. It can also cause summer kill, bring on other disadvantages of plant over-abundance and build up nutrients of shallow muds that lead to a continuing problem. If fertilization is done to stimulate such algal turbidity to control weeds, water quality and appearance may become objectionable.

Fish Food Application

Artificial feeding of fish should be avoided or greatly restricted if excessive vegetation is to be prevented. The wisest approach will often be to maintain no more fish than can grow well on the food naturally provided by the pond. However, if you want to have unnatural abundances of fish through supplemental feeding, feed as sparingly as possible—and be aware that you may be making a tradeoff in pond quality.

Vegetation Control by Temporary Methods

Pond treatments that don't control nutrient inflow can't control aquatic vegetation more than temporarily. Increasing pond depth by dredging or by raising the water level may be of longer-lasting effect than other temporary treatments but has high initial cost and other drawbacks. Measures such as poisoning the plants with toxic chemicals, introducing other chemicals to inactivate nutrients, or removing the plants physically must be repeated for as many years as relief is desired. The cumulative cost can be huge, and more than one treatment per year may be needed.

The "temporary symptomatic relief" afforded by such measures may be desirable to ease the unpleasantness of nuisance vegetation during the time it takes to find and control nutrient sources for permanent solution. However, the cosmetic effects of short-term treatments shouldn't be allowed to so obscure the problem that one loses sight of the underlying causes to be cured.

Eliminating one type of vegetation may just make room for replacement by some other equally bothersome kind. This takes place annoyingly soon in some cases. For example, less than a month after cutting or poisoning rooted plants, the area may become clogged with stringy algae. Nature abhors a vacuum. As long as light, warmth and nutrients exist in a pond, it will strive to fill the water with vegetation.

The vegetation of most ponds will continually change, even if unaltered by humans. One type of plant tends to be replaced by others. We call this "natural succession." By this process, a pond vegetation problem may alleviate itself in a few years. For example, nuisance growths of chara algae have been replaced by other plants that are less bothersome in some cases—with no control needed.

If short-term controls, such as outlined below, are to be used, it may be a good idea to switch methods every year or two. The kinds of plants that can best withstand one type of treatment may increase, but are likely to be controlled if the method is changed.