



AQUATIC ECOSYSTEMS

MANAGEMENT

P.O. Box 82 Golf, IL 60029-0082 Phone: 847-579-3090 Fax: 847-724-8212

AQUATIC ECOSYSTEM SURVEY

PURPOSE

The purpose of performing an aquatic ecosystem survey is to 1) identify both current and potential problems; 2) put problems in perspective for a particular pond; 3) define the causes of the pond's problems; and 4) outline possible solutions to the problems.

Identifying the potential causes of pond problems requires an understanding and appreciation of the interaction not only among components within the pond such as algae, aquatic plants, fish and other organisms but also the interactions between the pond and its watershed. For example, if a pond has become eutrophic (nutrient rich, green, low visibility) it could be that the fertilizers applied to an adjacent lawn are causing the problem. Like their land-based cousins, aquatic plants and algae need sunlight, water, carbon dioxide and nutrients – including phosphorous, nitrogen, potassium and calcium – to grow.

IDENTIFICATION

Problem diagnosis is a process that identifies the sources or causes of the pond impairments with each step. Once the causes are clearly defined, then several alternative watershed management practices and pond restoration techniques can be evaluated to alleviate or reduce the problems. Diagnosis is generally a two-step process: gathering history and any existing data as well as collecting and analyzing current data. Pond studies are designed for problem definition. A typical pond study includes a 1) Water budget: surface and groundwater inputs and changes in pond level; 2) physical parameters: sedimentation rate, temperature and transparency; 3) chemical parameters: dissolved oxygen and plant nutrients; 4) biological parameters: algae, macrophytes and a fish survey; 5) other parameters as required: alkalinity, pH and conductivity and 6) trophic state index. The trophic state index provides a quantitative means of assessing the pond's current condition and changes after protection and restoration practices have been implemented.

MANAGEMENT RECOMMENDATIONS

Pond management must be based on an understanding that ponds are complex and dynamic ecosystems. Ponds are influenced by hydrologic conditions, watershed, shape of the pond, water chemistry and bottom sediments. These physical and chemical components support a community of organisms that is unique to pond environments. All of these components, physical, chemical and biological are in constant change. Because ponds are highly interactive systems, it is impossible to alter one characteristic, such as the amount of algae or the clarity of the water, without affecting some other aspect of the system, such as fish production. Managing a pond for maximum benefit requires an understanding of how its ecosystems are structured and how they function as well as an understanding of what the pond owner wishes to achieve as a result of the management effort.