Clearing Muddy Pond Waters

L. A. Helfrich and T. Newcomb, Extension Specialists, Fisheries and Wildlife Sciences, Virginia Tech

Muddy, cloudy water is not only unattractive, but can be harmful to aquatic life. Although high sediment loads in ponds seldom kill sport fish directly, muddy waters can seriously reduce fish production. High suspended sediment loads in ponds can result in the following problems:

- Low sunlight penetration
- Reduced plankton production
- Low dissolved oxygen production
- Increased water temperatures
- Suffocated fish eggs and young
- Reduced fish food availability
- Reduced visibility and fish growth
- Off-flavor in food fish
- Diminished pond water volume

All other things being equal, clear water ponds can produce many more fish than muddy ponds. Muddy water reduces fish food availability and interferes with the ability of fish to see and catch prey. Muddy waters favor blue-green algae and bacterial growth, which can impart a bad flavor to drinking water and food fish. Green water is usually the result of algae, which is another type of problem with a different solution than that discussed here. It is a sad irony that the same soil that is vital for agricultural production on land becomes a major pollutant when suspended in water.

Muddy ponds are normally the result of soil erosion. Heavy rains and strong winds transport eroded soil into ponds from over-grazed pastures, unprotected croplands, and bare shorelands. Any area of bare soil provides a source for soil erosion.

Livestock trampling shorelands and wading in ponds or upstream waters add large quantities of soil and undesirable manure. Bottom-feeding fish, especially carp and bullheads, can contribute to muddy waters by rooting and stirring up bottom silt in their search for food.

Prevention of soil erosion is the best way to keep pond water clear. It is much easier to keep soil, especially clay soils, on the land than it is to remove clay particles once they have become suspended in pond waters. Soil runoff from nearby roads, croplands, livestock trails, overgrazed shorelands, and timber harvest areas must be prevented from entering the pond. Water clarity can be conserved by the following best land management practices:

- Strip cropping and contour plowing
- Terracing and land grading
- Installing sediment traps at the pond inlet
- Routing muddy water around the pond through diversion ditches (but not into streams)
- Planting shoreland grasses and cover crops
- Protecting upstream riparian (shoreland) vegetation shelterbelts
- Fencing livestock from the pond and upstream waters

Funding may be available for some of these activities from your local soil conservation district.

Treatments

Applications of chemicals (flocculants and coagulants) which bind and precipitate clay and other particles pulling them out of suspension can be used to clear muddy ponds. Alum (aluminum sulfate) applied on the pond surface at a rate of 150-300 pounds per acre (15 to 25 mg/L) has proven to be an effective treatment (Hargreaves 1999). However, alum may lower the pH, increase acidity, and in soft water (less than 20 mg calcium carbonate) should be used in combination with limestone (at a 1:0.5 ratio of alum:calcium carbonate) to buffer the water from drastic changes in acidity. Gypsum (calcium sulfate) and fine agricultural limestone (calcium carbonate) applied at a rate of 1,000-2,000 pounds per surface acre are other chemicals used to clarify ponds (Wu and Boyd 1990), although these chemicals may not be as effective as alum in clearing muddy ponds. These chemicals are widely available at farm supply stores.

Apply these chemicals so that they are completely and quickly mixed with the pond water. They should be premixed and pumped or sprayed as a surface slurry or distributed into the propeller wash of an outboard motorboat driven at high speed about the pond. If effective, the treatment should clear the pond in a few days and it should remain clear for months. If not effective, increase the dosage and frequency of chemical applications.

Because the exact application rate varies, concentrations for each pond can be determined by experimental treatment of pond water samples held in jars or buckets (small scale test) and use the level of chemical that caused the clay particles in the bucket or jar to precipitate within a day to calculate the treatment of the pond volume. Chemical clearing agents will provide only temporary relief if the source of the problem, eroded soil particles, is not eliminated by proper land management practices.

References

Hargreaves, J. A. l999. Control of clay turbidity in ponds. Southern Regional Aquaculture Center Pub. No. 460. Mississippi State University.

Wu, R. and C. E. Boyd. 1990. Evaluation of calcium sulfate for use in aquaculture ponds. Progressive Fish-Culturist 52:26-31.

Disclaimer: Commercial products are named in this publication for informational purposes only. Virginia Cooperative Extension does not endorse these products and does not intend discrimination against other products which also may be suitable.

Reviewed by Michelle Davis, Research Associate, Fisheries and Wildlife

---

Virginia Cooperative Extension materials are available for public use, reprint, or citation without further permission, provided the use includes credit to the author and to Virginia Cooperative Extension, Virginia Tech, and Virginia State University.

Issued in furtherance of Cooperative Extension work, Virginia Polytechnic Institute and State University, Virginia State University, and the U.S. Department of Agriculture cooperating. Edwin J. Jones, Director, Virginia Cooperative Extension, Virginia Tech, Blacksburg; M. Ray McKinnie, Administrator, 1890 Extension Program, Virginia State University, Petersburg.