



# The Pond Guidebook

By Jim Ochterski,  
Bryan Swistock,  
Clifford Kraft, and  
Rebecca Schneider

THE POND GUIDEBOOK

Ochterski, Swistock, Kraft, and Schneider

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Marty Sailus, PALS Director

# The Pond Guidebook

**Jim Ochterski**

Senior Extension Educator  
Cornell Cooperative Extension

**Bryan Swistock**

Senior Extension Assistant  
College of Agricultural Sciences  
School of Forest Resources,  
The Pennsylvania State University

**Clifford Kraft**

Associate Professor  
Department of Natural Resources  
Cornell University

**Rebecca Schneider**

Associate Professor and Leader  
Department of Natural Resources Extension  
Cornell University

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34 Plant Science Building  
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E-mail: [palspublishing@cornell.edu](mailto:palspublishing@cornell.edu) • Web site: <http://palspublishing.cals.cornell.edu/>

Marty Sailus, PALS Director

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## *Peer Reviewers*

### SHARON ANDERSON

Watershed Steward  
Cayuga Lake Watershed Network  
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Rubenstein School of Environment and Natural Resources  
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The Pennsylvania State University

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Professor  
University of Maine Cooperative Extension

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Program Specialist  
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Water Quality Educator  
The Pennsylvania State University Cooperative  
Extension

### MARK RICHER

District Technician  
Chemung County Soil and Water Conservation District  
Horseheads, NY

### KENNETH J. SEMMENS

Extension Specialist, Aquaculture  
West Virginia University

### JACQUELINE U. TAKACS

Regional Marine Specialist  
Maryland Sea Grant Extension Program  
University of Maryland

### DANIEL E. TERLIZZI

Water Quality Specialist/Sea Grant Extension Program  
University of Maryland / CANR /  
Center of Marine Biotech

### ERIC WATKINS

Conservation District Technician  
Tioga County Soil and Water Conservation District  
Owego, NY

### JEFFREY A. WHITE

Pond Owner  
Berkshire, New York

### ALAN WOOD

State Project Engineer  
USDA–Natural Resources Conservation Service  
Harrisburg, PA

### PETER WRIGHT

State Conservation Engineer  
USDA–Natural Resources Conservation Service  
Syracuse, NY

## About the Authors

**JIM OCHTERSKI** is a senior extension educator with Cornell Cooperative Extension and recently served for six years as the natural resources specialist for the South Central New York Extension Agriculture Team. He received a bachelor's degree in cell biology from the University of Rochester and a master's degree in natural resources and rural landscape planning from the University of Michigan. He has worked for Cornell Cooperative Extension for ten years, focusing on agriculture and natural resources issues. Jim has consulted with hundreds of pond owners throughout New York State and has reviewed and authored several Cornell Cooperative Extension bulletins on challenges ranging from pond structure development and weed eradication to commercial farm pond management.

**RYAN SWISTOCK** is a Senior Extension Associate in the College of Agricultural Sciences, School of Forest Resources, at Penn State University. He received a bachelor's degree in environmental health from Indiana University of Pennsylvania and a master's degree in environmental pollution control from Penn State University. For the past twenty years he has conducted research, teaching, and extension programs on water resources issues throughout Pennsylvania. Bryan currently organizes and presents pond and lake management workshops and is a co-teacher for an online pond management course through Penn State University. He has also authored dozens of pond management fact sheets and publications through Penn State Cooperative Extension.

**CLIFFORD KRAFT**, associate professor of fishery and aquatic sciences, Department of Natural Resources, Cornell University, first came to New York as an undergraduate student at Cornell University in the early 1970s, then returned to his native Midwest to earn master's and doctoral degrees from the University of Wisconsin at Madison. During his seventeen years as a program manager for the University of Wisconsin Sea Grant Institute, Kraft was engaged in diverse research and extension efforts related to managing fisheries in waters as large as the Great Lakes and as small as rural ponds. He has also been actively involved in research and extension work on zebra mussels. In 1998 Kraft returned to New York to join the faculty at Cornell University and conduct studies of coldwater fisheries throughout North America. He currently directs Cornell University's Little Moose Field Station near Old Forge, New York.

**REBECCA SCHNEIDER**, associate professor and leader, Department of Natural Resources Extension, Cornell University, joined the Department in 1996 with a bachelor's degree from Loyola College, a master's degree from University of Virginia, and a doctoral degree from Cornell University. She leads an integrated research, extension, and teaching program that focuses on the eco-hydrologic basis for sustainable water resource management. Her current research includes roadside ditch impacts on stream health and stream networks in central New York watersheds; groundwater discharge processes along lake shorelines; evapotranspiration and groundwater linkages in wetlands; and plant influences on stream bank erosion.





# Foreword

**C**ONSTRUCTED PONDS are a captivating combination of engineering, water flow, biology, aesthetics, and recreation. Hundreds of thousands of ponds of all shapes and sizes dot the rural landscape of the United States. Look at any aerial photograph of the countryside, and you will begin to note all the different places water is impounded for private use and management. From personally dug ponds of a few hundred square feet, to major construction projects of three or four acres (beyond which the body of water would be better termed a “lake”), these landscape features provide fishing, natural beauty, swimming, water for irrigation and fire suppression, storm water retention, wildlife habitat, canoeing, ice skating, and many other activities and purposes.

Ponds have been part of the human landscape for centuries. The earliest purpose for intentionally impounding water was to cultivate fish in ancient Asian, Middle Eastern, and Roman settlements. In the United States, ponds were built primarily for agriculture in early settlement times. In the nineteenth century, ponds consisted of dammed streams and excavated wetlands, and were usually used to provide more dependable water for livestock or crop irrigation. Artificial spring-fed ponds for fish production came about in the late 1800s. During the twentieth century, the purpose of pond development in some regions turned from agriculture uses to private outdoor recreation uses such as fishing, swimming, and landscape enhancement on country property.



FIGURE 1. Historically, ponds served as a source of water for farms and livestock.

In recent decades, many landowners have constructed new ponds, each with unique characteristics. The pond you own (or hope to own someday) has its own special features. Your specific management practices are likely to be different from those at a neighboring pond. Even adjacent ponds on a single property probably have different management needs.

Ponds are built to provide a certain value to the landowner. Some of these values are economic—such as to provide irrigation water for a consistent crop or healthy livestock or to raise fishing bait for sale. Real estate value is often enhanced by the presence of a well-maintained pond. Other ponds are built for their recreation value—the landowner wants a place to swim, fish, or study nature. Some ponds are built for no other reason than their intrinsic attractiveness as a country



FIGURE 2. An adult dragonfly emerges from its aquatic phase on the stem of a rush.



FIGURE 3. Each pond is managed differently, based on its size, location, and primary purposes.

landscape feature. In addition, some ponds have very specialized uses, such as storm water retention, wetland mitigation, or religious ceremonies. As a pond ages and matures, its owners will use it for a variety of purposes. As you will see, your planned use of your pond will affect your management decisions.

In his 1947 book *Fish Ponds for the Farm*, Frank C. Edminster summarized the allure of ponds in a poignant passage:

Certain intangibles beyond the measurement of money are the reasons why ponds are popular; they are why more and more people want to build them. In a thimble, it is the measure of better living that the pond contributes, the satisfaction of enjoying its beauty and its life. A pond is a fascinating scene through the seasons. It seems almost to create its own sense of being alive. The spring peepers that appear out of nowhere to fill the first days of the new season with lusty song; the dragonflies that hover, like helicopters not needing a rotor blade, over the water to catch any mosquito that has escaped the fish; the tree swallows nesting in the birdhouse on the pole, which swoop so gracefully through the warm summer air; the eery, gray mists that rise from the pond surface in the dawn of a cool autumn morn; the sealing blanket of ice and snow that comes with winter, preserving the virtues of the pond for another year; these and countless other vignettes of the pond, are amenities that make the pond invaluable.

This guidebook addresses many common concerns related to ponds. It is intended for owners of recreational ponds as well as owners of livestock and irrigation ponds on farms. Pond ownership can be very enjoyable, even with the modest amount of work needed to keep the pond functioning well. This book provides guidelines for developing and maintaining ponds. More importantly, it will help you understand the natural processes that make ponds a special part of the rural landscape.

As you consider your management options, you will make choices that are specific to your pond. However, making mistakes in pond management can affect many water users and wildlife habitats downstream and downhill, usually via surface water flow. In an effort to protect environmental quality, all guidelines in this book recognize that water is a shared resource that extends beyond the boundaries of individual landowners' property.

This book is divided into six chapters, starting in chapter 1 with an orientation to the various aspects of pond management. This chapter also explains parameters of pond water quality, such as temperature, nutrients, bacteria, and dissolved oxygen. It provides an important list of measurements you should record and keep to improve your decisions year after year.

Chapter 2 reviews the basic principles of pond construction and management. Although this chapter describes how ponds should be built, it also notes that local laws and site conditions are variable and that the use of local professional assistance is a key aspect of successful pond development. Chapter 2 also

provides guidelines for solving common maintenance problems like discolored or turbid water, low water levels, dissolved oxygen depletion, and the deterioration of spillways.

Pond fish management is described in detail in chapter 3, which covers the nature of fishery development in both warmwater and coldwater ponds, stocking recommendations, and details about which species are suitable for your pond. Determining the right balance of fish for your pond is usually a process of trial and error, because specific pond conditions and habitats are variable.

Chapter 4 addresses how to make decisions about aquatic weed control, one of the most common concerns among pond owners. It outlines the benefits of pond vegetation and how to know if a particular species or type of plant or algae is out of control. Vegetation types and control methods for each type are described in detail.

Wildlife is the focus of chapter 5—from developing features and structures that benefit aquatic organisms to managing nuisance wildlife and waterfowl. The

emergence of wildlife is an inevitable occurrence in every pond. Though some species, such as thrumming frogs, are treasured, other species—muskrats, beavers, geese, and even herons, for example—may cause problems for pond owners.

Chapter 6 provides recommendations for safety and recreation around ponds, including testing for stable ice, setting up a pond safety station, and dealing with trespassers. It also includes basic guidelines for beach development.

Throughout each chapter, diagrams and sidebars suggest remedies for some of the more common problems that pond owners face. These remedies have been generalized for a large geographic area—the Northeast, Mid-Atlantic, and Great Lakes regions. Some suggested treatments lack specific details because environmental laws vary from state to state. Use these guidelines to shape and narrow down your plans, and get local recommendations from your county cooperative extension office, soil and water conservation district, state environmental agency, or a qualified natural resource consultant.