AERF NEWS
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Restoration
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Regulatory

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David Petty, Editor

Clean Water Act

Carlton R. Layne. Executive Director

The U.S. Environmental Protection Agency and U.S. Army Corps of Engineers jointly released a proposed rule to clarify protection under the Clean Water Act for streams and wetlands that form the foundation of the nation's water resources. Determining Clean Water Act protection for streams and wetlands became confusing and complex following Supreme Court decisions in 2001 and 2006. The proposed rule was published in the *Federal Register* on Monday, April 21, 2014. The public comment period will be open for 182 days and will close on Monday, October 20, 2014.

The Aquatic Ecosystem Restoration Foundation is researching the proposed rule and will be preparing comments. AERF will keep the aquatic plant management community up to date on happenings related to the rule. We have retained Jim Skillen, a private consultant formerly with Responsible Industry for a Sound Environment, to assist in the effort.

The magazine, newspapers, television and the internet is full of everything from praise by the environmental organizations on one hand to charges of unconstitutional expansion of authority by federal agencies on the other.

Reported in the Washington Bureau's Newsletter today, June 10, 2014:

> The Environmental Protection Agency has extended the public comment period for its controversial " Waters of the United States" proposed rule, which would redefine what types of waters are subject to regulation under the Clean Water Act. The agency will now take comments about the proposed rule until Oct. 20, instead of the previous deadline of July 21. The agency said the extension "is in response to numerous requests," and it and the U.S. Army Corps of Engineers will continue to meet with state and local government officials, businesses, ranchers, environmentalists and other stakeholders during the comment period.
>
> Under the proposal, waters that have a "significant nexus" to navigable waters, interstate waters or the ocean would be subject to EPA regulation. This potentially could give federal regulators jurisdiction over everything from ditches to pastures on floodplains, witnesses complained at a House Small Business Committee hearing two weeks ago. Committee Chairman Sam Graves, R-Mo., said the agencies' decision "to give more time for input, as we suggested, is a step in the right direction."

Believe me this is not an easy read; and I worked for the feds for 35 years and have read lots of regulations in my time. I printed out the document because I'm old and can't bear to read lengthy documents on a computer. If you do the same, make sure you have plenty of printer cartridges or take it to a local printer because the document is 370 pages long. Granted it's double spaced and single-sided, but that's still 282 pages longer than the entire law in 1972. The summary is a little over 6 pages long and it takes another 2 or three pages to tell you what to do if you want to comment. The rest of the document goes like this in round numbers:

Continued next page

General Information – 40 pages – This section includes an executive summary, a shorter proposed definition of Waters of the United States (1 page), and a background section on the "Scientific Synthesis" and a summary of the "Significant Nexus" conclusions.

The Proposed Definition of Waters of the United States – 80 pages – You'll get tired of reading about it long before you get to the end of this section.

Related Acts of Congress, etc., etc. – 10 pages – These are all the legal requirements both the EPA and the Corps of Engineers have to satisfy in order to publish the rule.

Appendix A, Scientific Evidence – 140 pages – This section provides the scientific underpinning that justifies the expansion of the definition.

Appendix B, Legal Analysis – 98 pages – This section presents The EPA's and the Corps' interpretation of several Supreme Court decisions and how they justify their proposed actions under the law.

Now that we have the time to truly examine what is proposed, AERF plans to prepare a special newsletter for your information and provide recommendations in terms of what could be done, what our comments will be, etc... The agencies state that the proposed definition will provide clarity so the regulated community will know where they stand in regards to the requirements of the Clean Water Act. I must say that I'm more than a little skeptical when a federal bureaucracy just wants to make life easier for me. In addition, clarity is not what I found in my initial reading of the document.

My initial take is that EPA and the Corps of Engineers have cherry-picked one Supreme Court decision – *Rapanos v. United States*, 547 U.S. 715 (2006) – that defined Waters of the United States in a plurality. In other words there was not a majority of justices that agreed on a definition. There were four justices that agreed on one definition, four justices that agreed for the most part on another definition and there was one other definition posited by Justice Kennedy. It's that decision that contains language such as "biological connection" and "significant nexus"; and that's the opinion that EPA and the Corps have wrapped their arms around and endorsed. While there have been seven appellate cases with different takes on the *Rapanos* definitions, the Supreme Court has declined to hear any of the cases to date. With the Supreme Court failing to settle the matter, the EPA and the Corps of Engineers have resolved to satisfy any outstanding confusion regarding the proper definition of Waters of the United States by proposing the rule.

Since the intent is to clarify a confusing and controversial definition, I believe it is appropriate to do so in a rule. The concern is that the rule may "clarify" itself into an unprecedented expansion of federal jurisdiction, usurp authority granted to the states, and require landowners and other interested parties to make complex scientific and legal decisions for which they are ill prepared and for which there may be serious legal consequences if they choose incorrectly.

So what's the potential impact on aquatic plant management activities? Since NPDES permits are required to discharge pesticides (pollutants) in, over or near "Waters of the United States", I would anticipate a dramatic jump in the numbers of permits required with all the attendant additional expenses and recordkeeping to comply – and that's just the beginning. Stay tuned for the next Newsletter.

I appreciate your continued support of the Foundation through your feedback and financial donations. Remember AERF is a 501(3)(c) non-profit organization and your contributions are tax deductible. The 3rd edition of the Best Management Practices manual is now available for distribution. They will be available at the national and chapter meetings of the Aquatic Plant Management Society or you can request copies by contacting me at Clayne@Aquatics.org.

See Jim Skillen's companion article on page 6

Managing Phosphorus in Lakes

Dick Osgood, Osgood Consulting

The article "The Role of Phosphorus in Governing Algae Management," in the December 2013 issue of AERF News highlighted the role of phosphorus and recommend that "strategic approaches are needed to proactively manage" phosphorus and algae, but did not indicate what those approaches ought to be.

Here I provide a brief outline of phosphorus management strategies and approaches.

The December article mentioned that the use of copper based algaecides have limited efficacy and that regulatory changes may further limit their use. I agree, but here I focus only on phosphorus control as a way to limit nuisance algae.

Excess phosphorus in lakes causes nuisance algae – too much, too toxic or too yucky – and a long-standing paradigm in managing nuisance algae is to reduce excess phosphorus in lake water. There are two categorical ways to accomplish this: one, by reducing the inputs of phosphorus to the lake and two by reducing phosphorus already in the lake.

Early (1960s and 1970s) lake management success stories involved treating or diverting sewage pollution containing phosphorus. These cases involved long-standing pollution inputs to large, deep lakes. In most cases, the lakes responded to the reduced phosphorus. These cases then became models for pollution reduction strategies.

However, there were two problems. First, these lakes were responsive to the reductions due to their size, depth and other factors, whereas the majority of other polluted lakes are not responsive. Second, there was a presumption that reducing phosphorus from sewage inputs would have the same beneficial impacts of reducing phosphorus from watershed sources. Unfortunately they do not (for a summary see Osgood 2013), mainly because phosphorus accumulates in the lake sediments and recycles back into the lake water.

Since the 1980s, once sewage pollution was substantially under control, lake managers shifted to using these demonstrated phosphorus control methods:

External Controls

- Diversions – Diverting polluted inflows.
- Treatment – Treating the inflows with a precipitant to remove phosphorus.
- Best Management Practices – Applying watershed practices designed to reduce phosphorus.

Internal Controls

- Circulation/Oxygenation – To retard phosphorus release by increasing oxygen at the sediment-water interface.
- Hypolimnetic Withdrawal – To remove high-phosphorus hypolimnetic water.
- Water Column Phosphorus Stripping – Using a precipitant to continually remove phosphorus from lake water.
- Sediment Phosphorus Inactivation – Inactive mobile phosphorus using a chemical precipitant.
- Dredging – Physically removing phosphorus-laden sediments.

This is a simplified list, but covers the topic.

So, what works and what are other considerations?

I emphasize, for all phosphorus mitigation it is critical that a thorough diagnostic study be conducted to be sure excess phosphorus in the lake is the cause of the nuisance algae problems to be managed and a credible modeling exercise be done to evaluate the expected magnitude of expected phosphorus reduction. It continues to surprise and frustrate me how seldom these basic planning steps are bypassed.

Continued next page

External Controls

- Diversions – Effective when a significant phosphorus source is diverted. Usually involves structural solutions. Expensive.
- Treatment – Effective when a significant phosphorus source is treated. Usually involves structural solutions and requires collection of water materials. Expensive and ongoing.
- Best Management Practices – Seldom effective because usually a small portion of phosphorus source is mitigated.

Internal Controls

- Circulation/Oxygenation – May be effective, but must be properly designed and sized. Usually expensive and ongoing.
- Hypolimnetic Withdrawal – May be effective, where physical conditions are suitable. May be reasonably inexpensive.
- Water Column Phosphorus Stripping – Usually effective. Reasonably inexpensive, ongoing.
- Sediment Phosphorus Inactivation – Almost always effective, but requires appropriate dosing analysis and calculations. Moderately expensive, periodic applications usually required.
- Dredging – Perhaps the best truly restorative remedy, but requires disposal site. Usually prohibitively expensive.

These phosphorus mitigation approaches, at least the ones that are effective and feasible, require significant investments in planning and community commitment. As a result, the search for a "silver bullet" has resulted in many products and processes introduced that claim they are cheap, natural, quick, safe, effective or non-chemical. Unfortunately, many new products and processes have not been fully tested, so I caution their use.

I recommend:

- Use good planning principles – define the problem, diagnose its causes, evaluate all feasible alternatives.
- When evaluating alternatives, ask for appropriate case studies evaluated by third parties or (ideally) documentation in peer-reviewed technical journals.
- Conduct monitoring – expect and measure outcomes. I recommend about 20% of the lake management budget be dedicated to monitoring and evaluation.

Management is ongoing. There are seldom one-time solutions that work. Have an organization in place that can sustain the overall management of the lake you care about.

EPA Names New Director of the Office of Pesticide Programs

Jack Housenger has been selected as the new Director of the Office of Pesticide Programs (OPP). Jack brings a wealth of knowledge to the position having been with OPP for 35 of the last 37 years and having worked in five of the nine Divisions within the Program.

Since 2011, Jack has served as the Director of the Health Effects Division (HED) within OPP. HED is responsible for managing the review of health effects and exposure data for pesticides as well as the development of human health risk assessments. Prior to coming to HED, he served as the Director of the Biological and Economic Analysis Division.

Jack has also held other management positions within OPP including Associate Director for HED; Associate Director of the Antimicrobials Division (AD); Acting Director and Associate Director of the Special Review and Reregistration Division (SRRD); and Chief of the Special Review Branch in SRRD

Comparative Oral Toxicity of Aquatic Herbicides and Common Household Products

David Petty, NDR Research

A common question posed to aquatic applicators is how dangerous is the herbicide product you are putting in the lake? Toxicology testing is performed on all pesticides, as well as on the chemicals found in all common household products. Among the tests conducted, the most common (and most useful) is referred to as the oral LD50.

In toxicology, an LD50 value represents the dose of a chemical required to kill half of a tested species after ingestion. LD50 values are expressed in units of milligrams (mg) of substance per kilogram (kg) of body weight.

Toxicity increases as LD50 values decrease. For example, a chemical with a LD50 of 10 mg/kg is 10 times more toxic than one with a LD50 of 100 mg/kg. Considering that LD50 studies are conducted on all chemicals sold in the United States, they can be used as a means to compare the toxicity of one chemical to another.

The table below presents the acute oral LD50 for the active ingredient of common aquatic herbicides in comparison to common household products. The active ingredient is the main or primate ingredient in a product that makes it effective.

Herbicide	Oral LD50 (mg/kg)	Household Product	Oral LD50 (mg/kg)
2,4-D	3,129	Acetaminophen	1944
Bispyribac-sodium	4,077	Aspirin	200
Carfentrazone	>5,000	Bleach (Sodium Hypochlorate)	192
Diquat	866	Caffeine	140
Endothall	233	Cinnamon	275
Flumioxazin	>5,000	Deodorant	>2,000
Fluridone	>5,000	Hot Sauce (capsaicin)	161
Glyphosate	>5,000	Nail Polish Remover	>5,000
Imazamox	>5,000	Pink Bismuth (bismuth subsalicylate)	1,200
Imazapyr	>5,000	Table Salt	3,000
Penoxsulam	>5,000	Vinegar (Acetic Acid)	3,310
Topramezone	>2,000	Vitamin A	1,510
Triclopyr	1847	Vitamin C	2,000

Water, water, everywhere, and not a drop unregulated?

Opinion: Jim Skillen

On Thursday, May 29, 2014 the House of Representatives Committee on Small Business held a hearing; ***Will EPA's "Waters of the United States Rule" Drown Small Business?*** Well according to everyone that testified (not affiliated with the government) the costs of regulations and our government bureaucracy are out of control. You can read the testimony at this link: http://smallbusiness.house.gov/calendar/eventsingle.aspx?EventID=373099.

Everywhere you look, people are talking about this administration's latest power grab. According to Daniel McGroatly, President of American Resources Policy Network, "even the Clean Water Acts author, Senator Edmund Muskie, needed only 88 pages for the entire bill - EPA's definition of water runs 370 pages." He also said, "According to estimates by the US Army Corps of Engineers, more than $220 billion in economic development runs through Section 404 every year. With the US economy growing around 3 percent annually, that's more than half the projected GDP increase for 2014. And that's before the EPA's expanded definition of water. With more and more of US economic development falling under its purview, EPA's endless appetite for project delays could push the US economy back into recession." Well, I'm not sure the US economy is going to grow 3 percent this year, but the rest of his comments are spot on.

I know that I read the proposed rule, all 370 pages and I am more confused now than I was when I started. The proposal makes it absolutely clear; all ditches with **perennial flow** are "waters of the United States" except the ditches that do not contribute flow to the tributary system of traditional navigable water, interstate water or the territorial seas. According to the EPA, there are 2,110 watersheds in the continental United States and all water moving through each of those watersheds will eventually reach navigable water, interstate water or the territorial sea, minus the four watersheds that drain into the Great Salt Lake Basin.

So, if you are an applicator and apply pesticides ***in, over or near*** a ditch in the remaining 2,106 watersheds pay close attention. You have a minimum of three years [assumes future litigation] to figure out the difference between upland ditches and lowland ditches. You have a minimum of three years to learn how to calculate **perennial flow** for any ditch. Your calculation will determine whether or not any pesticide application ***in, over or near*** the ditch [assumes we lose the litigation] is subject to the NPDES permitting program and its additional costs. Do not confuse swales and ditches; according to the EPA swales are almost always wet [except when they are dry].

Now, we all have a much better understanding of the old adage, a camel is a large solid-hoofed herbivorous ungulate mammal (horse) designed by the government.

3 States Teaming Up On Aquatic Invasive Species

Midwest boaters are being urged to drain and clean their boats and trailers to prevent the spread of aquatic invasive species across their borders.

Minnesota, Wisconsin and Michigan have teamed up for a public service campaign to encourage boaters and anglers to avoid spreading zebra mussels, spiny water fleas and other aquatic invaders when they travel between states.

Wisconsin DNR Secretary Cathy Stepp says the three states share a common goal of stopping aquatic hitchhikers to keep the Great Lakes and inland waters healthy.

Minnesota Department of Natural Resources Commissioner Tom Landwehr says the multi-state production offers a consistent message and a coordinated approach to address the problem.

In addition to YouTube, the 30-second spot is airing on outdoor programs, public television, fishing and sports channels across the three-state area.

Kirchman Foundation's Lake X-travaganza

Jeff Holland

Early morning before sunrise a barn owl hoots, making it's call heard on the other side of a calm black-water Florida lake. All is quiet until the silence is broken by the sound of gravel being crushed under truck tires. The first of many fishing boats arrive at the launch ramp of the former Mercury Marine testing site known as Lake X. Long since abandoned as a testing facility, the Lake X property is now managed by the charitable organization of the Kirchman Foundation.

Lake X-travaganza is one of the many ways the Foundation introduces awareness and understanding of nature, wildlife, and old Florida to kids and parents.

On April 12, 2014, myself and 40 other boat captains arrived at the Lake X property to take a group of nearly 100 kids fishing and to share the outdoors. Another group of volunteers provided educational programs and workshops at the recreational facilities on shore.

Youth Tournament:

I was to captain twin sisters Giovana and Giomara, high school seniors a month away from graduating. Neither of them had ever cast a fishing pole, let alone fished any kind of tournament.

The tournament organizer, Neal, allowed me to use two Zebco 202 push-button rod and reel combos for the girls. Being they were new to angling, I had hoped to spend the day teaching them to cast and just enjoy a nice morning on this undeveloped private lake. I never knew the trip would turn out the way it did.

We were boat 35 and at takeoff I motored my Triton boat across the lake to a Cypress tree line in water only two feet deep. My experience had taught me that shallow water areas hold the most fish, so I chose an area to give us the highest odds of catching something. To keep the girls from snagging all the grass and trees along the shoreline I tied on artificial worms. Using a weedless Texas-rig technique, I buried the hooks deep into the plastic baits.

The Zebco reel is a classic beginner fishing reel of many anglers. It is easy to operate and cast. This push-button style reel was created after World War II when the "Zero Hour Bomb Company" (Zebco) begin using its factories to make fishing tackle. I was pleasantly surprised to see the girls master casting after only a few tries, and they even developed the ability to cast the worms between Cypress trees.

Giovana, the oldest twin by 1 minute, caught the first fish of her life, a twelve inch bass! Within a half hour her sister Giomara had hooked and lost two nice bass before landing her first fish ever, a thirteen inch bass!

I was proud to be teaching these first-time anglers all about the great outdoors. The girls battled it out all morning hooking and losing more fish, asking who's is biggest and keeping track of who got the most bites.

Occasionally, while the girls cast to shallow water, I would make a pitch out to the deeper grass line with my flipping rod. On one pitch I felt a fish hit the bait, so I handed the rod to the closet girl, Giovana. When she reeled down to set the hook the fish nearly pulled her overboard. A five-pound bass came rushing out of the grass like a lassoed bull. Giovana fought with all her might and her sister Giomara helped hold the rod during the battle. After what seemed like forever I netted the bass. The girls squealed and celebrated at having landed such a big bass

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on their first fishing trip ever. I was astonished at the size of the bass these "first timers" had landed!

Not to be outdone by her sister, Giomara began concentrating harder at catching a big fish too. She hooked two bass in the three-pound class that simply pulled off. She continued to get bites but the bass were short striking and threw the hooks.

After having fished the first area for several hours the bite slowed. I moved to another area to keep the girl's excitement up. It worked, and the sisters began fishing around the new set of Cypress trees with renewed energy.

It wasn't long before Giovana let out a yell that she hooked a fish. I turned around to hear the drag of her Zebco reel scream as the fish peeled the ten-pound fishing line off the reel like thread. At first I thought it was a mudfish, a species that also inhabits the shallows of Florida blackwater lakes. Then my eyes widened as I could see it was a bass worthy of any experienced tournament angler!

Giovana fought the fish around the boat and wore it down so I could net the giant bass. The bass easily weighed over six pounds, and later at the weighing it earned her the event's "Big Bass" award for the 14-17 yr. age bracket.

Because the tournament was a "one-fish-per-angler" event, Giovana had to cull out and release her five pound bass. Having landed two big bass on artificial worms was an amazing feat for such novice anglers.

Giomara, the younger sister, was not afraid of touching fish and helped her sister release all the culled bass.

Giomara had fun casting and catching anything, and ended the day by catching her personal biggest bass just before weigh-in. While her fish did not beat her sister's big bass, Giomara did hook into the most bass of the day and earned bragging rights among the sisters.

These young ladies had landed two quality bass despite having never fished. I was so proud of both girls and their ability to listen to my coaching.

Thanks to the Kirchman Foundation, many kids and parents were able to experience the beauty of nature and it's healing powers at the Lake X property.

A special thanks goes to Neal Lazarus and Bass Pro Shops for allowing Giovana and Giomara to take home their Zebco combos. The memories attached will likely last a forever.

In addition to the Osceola County Sheriff's department, the Florida Fish and Wildlife Conservation Commission (FWC), Teen Sportfishing Association (TSA), and Fishing Florida Radio were key partners at introducing youth to the outdoors and making the event successful. It was a pleasure working with all the groups.

Follow Jeff at http://www.jeffhollandfishing.blogspot.com

AERF Social Media and Outreach

AERF has joined the social media scene in full force! Have you noticed the big, familiar icons at the top right corner of our aquatics.org web page? Click on each link to visit us on Facebook, Twitter, or the AERF's customized blog, "The Aquatics Update". Along with industry and regulatory updates, the blog features such segments as the "AERF spotlight", highlighting outstanding individuals, and the "Feature Focus Friday" which showcases current research in the aquatic sciences. New postings are frequent, often 2-3 times per week so please stop by and discover the latest in aquatic plant management, science, and innovation! Along with our frequent blog postings, you can find regular postings of news snippets, information, and daily current events on our Facebook and Twitter pages. Like what you see? Let us know by leaving us a comment or "like" on Facebook or follow us on Twitter . If you would like to nominate anyone to be featured in our blog or would like your content considered, please email to socialmedia@aquatics.org. We look forward to seeing and hearing from you in each of our outlets!

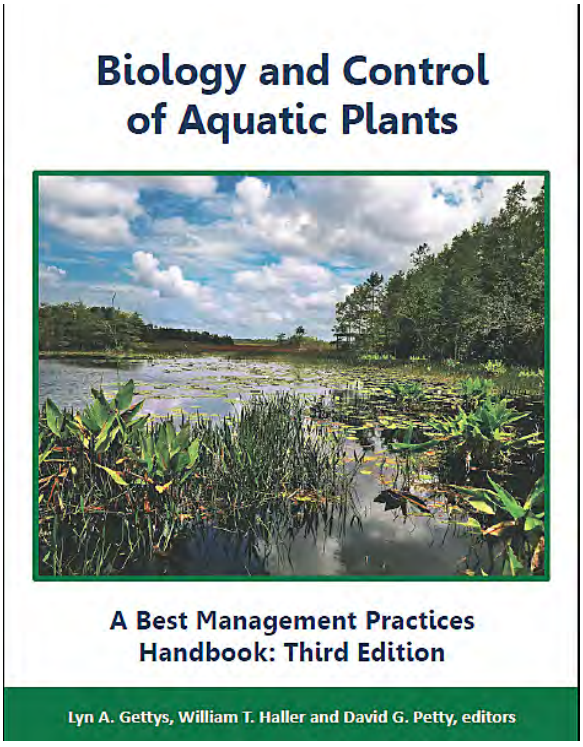
New Aquatic Weed ID App

Whether you're a professional botanist or a casual nature enthusiast, the NC State University (NCSU) Aquatic Weeds app has detailed information on a wide variety of aquatic weeds to assist in identification.

The NCSU Aquatic Weeds app contains well organized and detailed information, as well as clear and highly detailed pictures. This handheld app is invaluable to making an accurate identification in a field situation. It's a must have app for any aquatics professional, botanist, or fresh water preservationist.

Available for FREE download at the Apple App Store: https://itunes.apple.com/us/app/water-weeds/id876023735?mt=8

An Android version is currently under development. Watch our Facebook page for announcement of its release.



BMP 3rd Edition

The Third Edition of the popular BMP manual is now available online as a PDF file on our website at :

http://www.aquatics.org/bmp.html

The print edition will be available soon; watch our social media sites for that announcement.

The first and second editions of this handbook became some of the most widely read and used references in the aquatic plant management community. This third edition has been specifically designed with the water resource manager, water management association, homeowners and customers and operators of aquatic plant management companies and districts in mind. It is not intended to provide the answers to every question, but it should provide basic scientifically sound information to assist decision-makers.

This edition includes expanded sections on management, as well as the addition of new weed species.

Attention Sponsors:

Your sponsorship renewal letters should be mailed later this month. Please keep an eye out for them. Not a sponsor? Please consider becoming one and supporting AERF's goals and programs! Just complete the sponsorship form below, or access it on our website at http://www.aquatics.org/sponsorshipform.pdf.

Your AERF Sponsorship is key to:

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To donate, join or renew your Sponsorship in the AERF **please send the completed application form and payment to Treasurer, AERF, 1860 Bagwell Street, Flint, MI 48503-4406.**

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☐ Check here if you are an applicator company, so we can include you on our applicator pages.

☐ Check here if you would like to receive a free copy of the BMP with your membership.

Please use the following as a guide in the selection of the desired level of Sponsorship:

Of course, you are welcome to join AERF at any level and additional donations are appreciated.

☐ **Gold** is recommended for manufacturers and registrants	$15,000
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☐ **Affiliate** and above is recommended for consultant and application companies, equipment manufacturers/resellers and biological producers/resellers	$1,000
☐ **Associate** and above is recommended for societies, federal and state agencies, aquatic resource management associations, applicators and consultants	$250
☐ **Individual** and above is recommended for individual members	$50
☐ **Student** and above is recommended for students	$0

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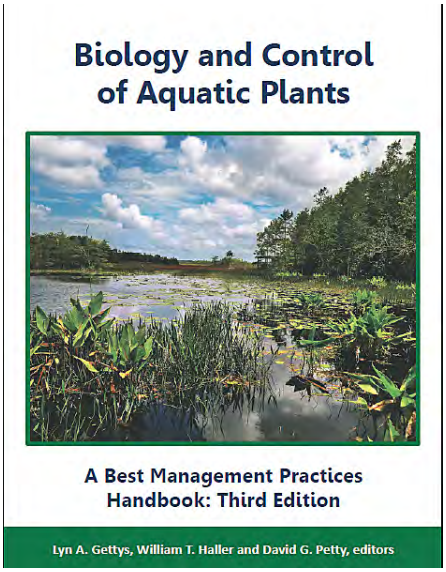

Sponsorship

The AERF respectfully requests that you consider sponsorship. AERF will continue to work on your behalf, and as a member, you will greatly benefit from our work on regulatory and research aspects of aquatic plant management. With changes in the regulatory environment now and in the future, it is essential to be involved and to support all the hard work of your AERF associates.

Please contact Carlton Layne for information on how you can best participate.

The AERF Mission

The Aquatic Ecosystem Restoration Foundation is committed to sustainable water resources through the science of aquatic ecosystem management in collaboration with industry, academia, government and other stakeholders.

Strategic Goals

- Provide the public information concerning the benefits and value of conserving aquatic ecosystems including the aquatic use of herbicides and algaecides in the aquatic environment.
- Provide information and resources to assist regulatory agencies and other entities making decisions that impact aquatic plant management.
- Fund research in applied aquatic plant management at major universities.

Upcoming Events

Jul 13-16	**APMS: Savannah, GA**
Sep 23-24	**Aquatic Weed School: US Davis**
Oct 13-16	**FAPMS: Daytona Beach, FL**
Oct 23-25	**SCAPMS: Myrtle Beach, SC**

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