



President's Message

I hope this newsletter finds everyone well and you've enjoyed your summer. The elk are singing and the aspens are starting to turn that beautiful golden yellow. If you're like me, this time of year finds your workload starting to wind down and it's time to start using some of those vacation hours banked over the busy summer season. It's also time to reflect on some of the problems encountered over the busy treatment season.

One issue we're all hearing more about in the aquatic industry is herbicide resistance. With a limited number of active ingredients registered for use in the aquatics industry, we are all faced with a unique challenge. In terrestrial weed control, often 3-4 or more products are available for species control with multiple modes of action. Unfortunately, this isn't the case in aquatics. The Weed Science Society of America (WSSA) and the Aquatic Plant Management Society (APMS) have assumed the task of providing a guideline for the aquatics industry. The goal is to have a document that gives aquatic plant managers guidance to prevent herbicide resistance, especially to invasive aquatic weeds in the U.S. The goal is to have this document completed within the coming year, and launching the document at the annual 2014 APMS meeting.

Another issue is the discovery of monoecious hydrilla in New York. The initial infestation was originally found in the Cayuga Lake Inlet; however, additional infestations have been found in other locations throughout the lake and the Erie Canal, which the lake flows into. The finding in the Erie Canal is a very significant find because it could mean potential infestations of the Great Lakes by this extremely invasive plant.

Finally, a non-native species is getting more attention especially in the southeast and Mid-Atlantic States. Crested floating-heart was first reported in 1996 in Collier County, Florida. It is now present in many Florida water bodies. Large infestations can also be found in Lake Marion, an 110,000 acre reservoir in South Carolina. In 2006, the population in Lake Marion was reported to be approximately 20 acres, growing to over 6,000 acres as of October 2012. The largest infestation of crested floating-heart is in South Carolina in Lake Moultrie. Crested floating heart was first reported in 1996 in Collier County.

There are five species of floating heart (*Nymphoides* spp.) in the United States. Two species are native, little floating heart (*N. cordata*) and banana lily or big floating heart (*N. aquatica*), and three exotic, non-native species, yellow floating heart (*N. peltata*), snowflake (*N. indica*) and crested floating heart (*N. cristata*).

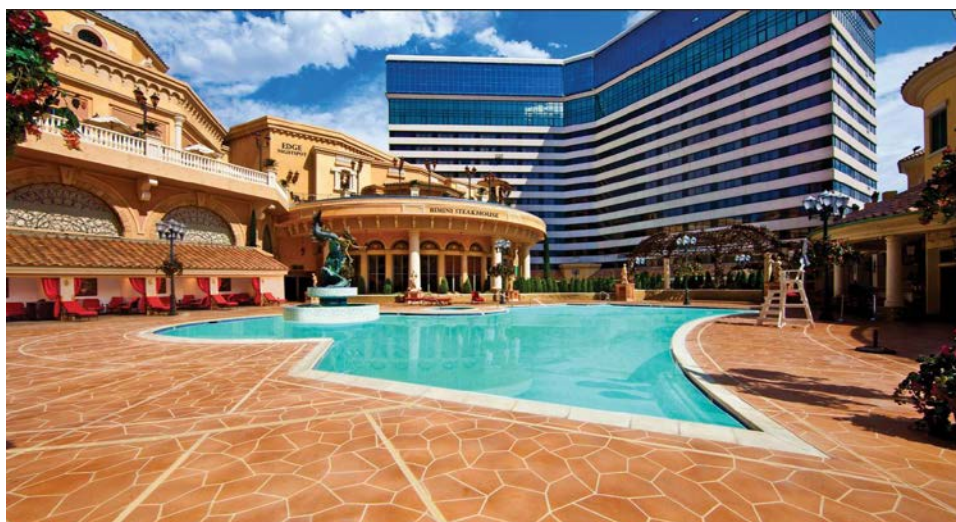


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So, you might be asking yourself about what *Nymphoides* has to do with the Western Aquatic Plant Management Society (WAPMS)? Just last week, I received an email from an Oregon State University professor asking about control measures for yellow floating-heart. Apparently, the Oregon Department of Agriculture has found a pond infested with this non-native species. So, just when you think it isn't a problem for us in the West, you never know where these plants might show up!

I'm looking forward to another fun and educational meeting of the WAPMS in Reno, NV from March 30 to April 2, 2014. Please make a special effort to attend. I look forward to seeing everyone there.

Sincerely,
WAPMS President



Notes on the 2014 Program and Call for Papers Patrick Akers, Vice-President and Program Chair

Come meet with us in Reno this March!

The WAPMS 2014 Annual Conference will be held at the Peppermill Reno Resort, in Reno, NV, from March 31 to April 2, 2014. The Resort has garnered high ratings among local hotels, and was voted best hotel in northern Nevada by the readers of Nevada Magazine. WAPMS members who have stayed at the hotel report their stays were pleasant and satisfying. We have arranged for a block of rooms for the very good price of \$109 per night, which will be

available for the nights of March 30 through April 2.

The program is taking shape now, as I discuss ideas for sessions and topics with several members. Among the possibilities are herbicide modes of action and resistance management, environmental fate and ecotoxicology of herbicides, plant management in canals, the relationships between aquatic plants and other species including fish, and aquatic invasive species and their control in Lake Tahoe. These topics are in the exploration phase and nothing is set in stone, so if you have an idea for a session or a talk, I would be happy to hear from you.

At the Board meeting after the last Conference, the Board expressed an interest in developing some Editorial Guidelines for presentations and



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abstracts, to try to maintain consistency in the talks. Among them, abstracts will be limited to 300 words (about half a page), we will encourage presenters to base their presentations on data or other objective measurements, and supporting videos will be limited to four minutes in length. When the Web page for attending the Conference becomes active, the Guidelines will be listed on the Abstract Submission page.

The first day to submit your title and abstract will be November 11, 2013 and the last day will be December 13, 2013. Once again we are asking for your submissions early. It is very important in our efforts to obtain Continuing Education Credits from all the different state, so we ask your patience with the inconvenience. Stay tuned and check the WAPMS website for developing information on the conference.

Thank you and I look forward to putting together an excellent program for our Conference next year.

CE Credits for 2014 Tom Moorhouse WAPMS Newsletter Editor

Last year we divided the task of organizing continuing education (CE) credits between three volunteers and feel it worked quite well, so we will be dividing up responsibilities again in 2014. Splitting the effort has helped reduce the burden that was typically placed on one person in past years. We have tentatively again identified volunteers to organize credits for the following states as follows: Idaho, Montana, and California (Tom Moorhouse), Arizona and New Mexico (Paul Westcott), Oregon and Washington (Toni Pennington), and Nevada (Tyler Fowler). If you're from Colorado, Wyoming, Utah, or another western state not listed and you're hoping to get CE credits at the 2014 WAPMS conference, you may be disappointed unless you help out! If there are no volunteers for the remaining states, there will be no credits for them. Contact the 2014 Program

Chair, Patrick Akers (patrick.akers@cdfa.ca.gov), to volunteer.

Important Reminder: The WAPMS Scholarship Joe Vassios, Scholarship Chair

The 2013 recipient of the WAPMS Barbra H. Mullin Memorial Scholarship was Eli Kersh-Olivia from California State University, East Bay. The Barbra H. Mullin Memorial Scholarship will again be available for 2014. Scholarship applications are due by March 14, 2014. The scholarship will provide \$2,000 to a deserving student (undergraduate or graduate) who is engaged in course work or research related to the biology, ecology, management, or education of aquatic plants. The application process is very straight forward. Students interested in applying have to provide an application package containing a short resume/CV, unofficial transcripts, two letters of support and a statement about how funds are to be used. Please see the complete scholarship announcement posted on the WAPMS website at www.wapms.org. Applications should be emailed to Joseph.Vassios@uniphos.com. The recipient will be announced at the 2014 WAPMS meeting in Reno, NV. Please encourage your students or students that you have contact with to apply.

Student Registration Waiver!

Students attending the WAPMS conference have their registration fees waived. Students are not required to make oral or poster presentation; however, their participation is highly encouraged. Participation fosters increased interaction between students and other researchers, industry representatives and managers. For more information check the WAPMS website (www.wapms.org) for conference updates.

Member's Contributions

Washington Irrigation Districts Challenge Toxicity Assumptions and Lead *Cascade*[®] Salmonid Study

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Washington State is one of few states that issues the Clean Water Act's National Pollutant Discharge Elimination System (NPDES) permits for all point-source discharges within the state into U.S. waters. Since 2002, these five-year permits include the discharge of aquatic herbicides, thereby directly impacting how irrigation districts manage aquatic weeds in canals and laterals.

Under NPDES, one of the permitted herbicides for irrigation districts is the dipotassium salt formulation of endothall (*Cascade*[®], United Phosphorus, Inc). This non-selective herbicide effectively controls various noxious species, including the nuisance Eurasian watermilfoil found in most of Washington's irrigation waterways. Standard toxicity testing has shown endothall to be relatively non-toxic to fish and other aquatic organisms. However, in 2010 WDOE placed conservative limitations on endothall due to the presence of migrating ESA-listed juvenile salmonids in supporting watersheds during herbicide application season. This decision was largely based on uncertainties surrounding a study that found endothall could have deleterious latent effects on juvenile salmonid survival as they transition into seawater. As a result, WDOE limited application rates to one-fifth the Federal label rate. However, in order to effectively manage their aquatic weeds in the irrigation waterways, districts were finding that they needed the option to exceed the low application rate set by WDOE.

With an impending NPDES permit renewal, irrigation district managers and their representative professional body, the

Washington State Water Resources Association (WSWRA), assessed the strength of current data and questioned the assumptions surrounding the published research. WSWRA brought their concerns about the research uncertainties to Portland, Oregon-based Cramer Fish Sciences (CFS) and proposed a large-scale salmonid research project to determine whether the maximum label rate affects the survival of emigrating juvenile salmonids (smolts). In conjunction with Mount Hood Environmental, CFS designed a flow-through system to simulate freshwater endothall exposure (**Figure 1**) and seawater transition (**Figure 2**) for a large-scale study for juvenile salmonids.



Figure 1. Flow-through freshwater herbicide exposure tanks for salmonids. Coho, Chinook and steelhead were reared in freshwater under ideal husbandry conditions before placement into flow-through tanks. Salmon were exposed to varying concentrations of endothall 0-12 ppm for 96 hours and allowed to recover before a 10-day seawater challenge assay.



Figure 2. Flow-through seawater challenge tanks. Following a 24-hour recovery from endothall exposure, salmon were placed in circular seawater challenge tanks, allowed to acclimate, and then gradually exposed to 30 ppt seawater over 24-hours before a 10-day survival analysis.

The experimental design of the study included the use of three salmonid species – coho, steelhead, and Chinook – and focused on appropriate husbandry conditions to avoid effects of extraneous environmental variables.

Results indicated that the concentrations for effective weed control are well below the levels at which a toxic response was observed in anadromous fish. **Figure 3** illustrates that the toxic response threshold following seawater transition is approximately 10-12 ppm a.e., compared with the 5 ppm maximum label rate.

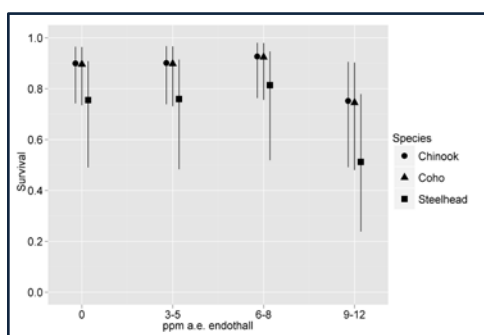


Figure 3. Predicted survival probabilities for Chinook salmon, coho salmon, and steelhead trout following exposure to four different levels of *Cascade*[®] (expressed as endothall in ppm a.e.) and subjection to a 10-day seawater challenge.

These data proved adequate and reliable for WDOE to make an informed permit modification for endothall. This change proved beneficial for all irrigation districts that saw their permit limitations increased in time for the 2012 irrigation season.

Because of WSWRA’s accurate assessment of the scientific research and their open dialogue with WDOE, they were able to lead Washington irrigation districts into a novel science-based approach to generate reliable data necessary for the permits needed for effective weed control while maintaining their goal of environmental stewardship.

Efficient Algae Management in Today’s Regulatory World

West M. Bishop and Ben Willis
SePRO Research and Technology Campus, SePRO Corporation

As the regulatory scene on pesticides continues to intensify, novel approaches are required to maintain the desired level of algae control while decreasing overall algaecide inputs. The National Pollutant Discharge Elimination System (NPDES) Pesticide General Permit (PGP) declared prevention as a key management action. Additionally, USEPA’s Re-registration Eligibility Decision (RED) for copper instated label mandates requiring a minimum of 14 days between treatments in most waters. This means solutions are needed to prevent nuisance algae from arising, maintain acceptable algal densities and assemblages, and to increase duration of control following treatment. To fulfill these objectives, an integrated solution is required that addresses the key causative factors of nuisance algae growth as well as enhances the efficiency of algaecides.

As harmful algal bloom frequencies increase, water bodies historically impacted could greatly benefit from a proactive approach. Also, water bodies with nuisance algae infestations need an option to attain rapid control while decreasing rate and amount of re-growth (i.e. select for better algae types and/or lower densities). So how do we efficiently decrease, and maintain low densities, of harmful algae types that are negatively impacting our aquatic systems? Phosphorus is a common limiting nutrient in freshwater resources which influences the overall algae biomass and algal assemblage composition. Many cyanobacteria can fix their own nitrogen, utilize multiple forms of carbon, and photosynthesize at low light intensities. Limiting phosphorus availability is an important factor in preventing cyanobacteria dominance. Toxin/taste and odor producing cyanobacteria often prefer low Nitrogen:Phosphorus (N:P) ratio nutrient conditions (i.e. high phosphorus inputs) and require a high demand for phosphorus per unit biomass. Phosphorus is rampantly being introduced into our surface



waters through many sources (i.e. sewage, fertilizer, agricultural runoff, etc.) and historic accumulation can continually fuel nuisance algae blooms (cyanobacteria in particular). Thus, addressing bio-available phosphorus should be a key consideration for an integrated algae management approach.

Recently, the USEPA registered the first and only Algaecide and Water Quality Enhancer (SeClear®, EPA registration no. 67690-55; NSF certified; patent pending) that addresses the need for a more multi-dimensional, holistic approach to algae management. This integrated solution provides both effective algaecidal activity (i.e. reactive or curative) and is formulated to remove phosphorus from the system (i.e. proactive or preventative). Multi-year field site evaluations have consistently shown: 1) efficient copper use (increased algaecidal efficacy and fewer applications) to maintain water bodies below designated action thresholds, 2) decreased nuisance algae re-growth rates following treatment (longer time before a subsequent treatment is triggered), and 3) maintaining low densities of beneficial algae that support the food chain (prevention of harmful algae dominance).

By directly controlling nuisance algae and removing the primary nutrient responsible for re-growth, long-term benefits to water quality can be measured. With decreased harmful algae densities there is less potential for negative impacts following an algaecide treatment (e.g. dissolved oxygen sag) and less product required at the time of application for desired control. Also, with lower growth rates of harmful algae, more time between treatments is predicted prior to achieving algal densities that exceed an action threshold and invoke a management decision. Additionally, removing phosphorus with each application and shifting nutrient ratios (e.g. N:P) can select for more beneficial algae types, such as diatoms and green algae, that support desired organisms (e.g. fish) and compete for other resources to suppress rapid recovery of nuisance populations.

With the current mindset of decreasing algaecide inputs (NPDES PGP), decreasing treatment

frequency (Copper RED), and increased awareness of a key underlying cause fueling harmful algae blooms (phosphorus); SeClear Algaecide and Water Quality Enhancer provides a more advanced, integrated solution to address algae and water quality management challenges.

EPA Proposes Rule to Modernize Clean Water Act Reporting

E-reporting initiative will increase efficiency, ease burden for states and improve public access to data

(from Aquatic Plant News, October 2013, www.apms.org)

WASHINGTON – The U.S. Environmental Protection Agency (EPA) has proposed a rule that would modernize Clean Water Act (CWA) reporting processes for hundreds of thousands of municipalities, industries, and other facilities by converting to an electronic data reporting system. The proposed e-reporting rule would make facility specific information, such as inspection and enforcement history, pollutant monitoring results, and other data required by permits accessible to the public through EPA's website.

EPA estimates that, once the rule is fully implemented, the 46 states and the Virgin Island Territory that are authorized to administer the National Pollutant Discharge Elimination System (NPDES) program will collectively save approximately \$29 million each year as a result of switching from paper to electronic reporting.

“In addition to dramatically cutting costs for states and other regulatory authorities, the e-reporting rule will substantially expand transparency by making it easier for everyone to quickly access critical data on pollution that may be affecting communities,” said Cynthia Giles, assistant administrator for EPA's Office of Enforcement and Compliance Assurance. “The e-reporting rule will also allow states and other regulatory authorities to focus limited resources on the most serious water quality problems, which will lead to in-creased compliance,



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improved water quality, and a level playing field for the regulated community.” Currently, facilities subject to reporting requirements submit data in paper form to states and other regulatory authorities, where the information must be manually entered into data systems. Through the e-reporting rule, these facilities will electronically report their data directly to the appropriate regulatory authority. EPA expects that the e-reporting rule will lead to more comprehensive and complete data on pollution sources, quicker availability of the data for use, and increased accessibility and transparency of the data to the public.

The CWA requires that municipal, industrial or commercial facilities that discharge wastewater directly into waters of the United States obtain a permit. The NPDES program requires that permitted facilities monitor and report data on pollutant discharges and take other actions to ensure discharges do not affect human health or the environment.

Most facilities subject to reporting requirements will be required to start submitting data electronically one year following the effective date of the final rule. Facilities with limited access to the Internet will have the option of one additional year to come into compliance with the new rule. EPA will work closely with states to provide support to develop or enhance state electronic reporting capabilities.

EPA has already scheduled several webinars in an effort to help states, trade organizations, and other interested parties better understand the details and requirements of the proposed rule. Over the next few months, EPA expects to schedule additional webinar sessions.

The proposed rule will be available for review and public comment for 90 days following the publication date in the Federal Register.

View the proposed rule in the Federal Register: <https://www.federalregister.gov/articles/2013/07/30/2013-17551/npdes-electronic-reporting-rule>

EPA Approves the Use of Arundo Donax for Biofuel Production

(from Aquatic Plant News, October 2013, www.apms.org)

EPA has finalized pathways for production of renewable fuel from giant reed (*Arundo donax*) and napier grass (*Pennisetum purpureum*) as feedstocks. These pathways are for cellulosic biofuel, for purposes of the Renewable Fuel Standard. In response to comments on the proposal concerning the potential for these crops to behave as invasive species, EPA has adopted additional registration, recordkeeping, and reporting requirements. The fact sheet on the supplemental final rule can be found at <http://www.epa.gov/otaq/fuels/renewablefuels/documents/420f13014.pdf> and the final rule at <http://www.gpo.gov/fdsys/pkg/FR-2013-03-05/pdf/2013-04929.pdf>.

Site of the 54th APMS Annual Meeting You've Gotta Come to Savannah, Georgia!

Mark your calendar, July 13-16, 2014, for the 54th Annual Meeting of the Aquatic Plant Management Society!



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2013-2014 Western Aquatic Plant Management Board of Directors

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The **Western Aquatic Plant Management Society (WAPMS)** is the western chapter of the **Aquatic Plant Management Society** – an international organization. The geographic region of WAPMS includes the states of: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Oregon, Nevada, New Mexico, Montana, Utah, Washington, and Wyoming. WAPMS produces a bi-annual newsletter (sent electronically), holds an annual conference, and maintains a membership list. Members also receive the *Aquatics Magazine*.

The purpose of the WAPMS is to:

- Promote the management of non-native and nuisance aquatic vegetation.
- Encourage scientific research.
- Promote student scholarships.
- Provide scientific advancement and knowledge to its members.
- Extend and develop public interest in aquatic plant management activities.

Editorial Guidelines for Members' Submissions: Articles may be on any subject of general interest to the Society, such as news on members, updates on projects, or announcements of new products. They must include a byline with the authors' names. Responsibility for the article lies with the authors. All articles of 300 words or less will be printed, as long as they pertain to the business of the Society. The Newsletter editor will edit them only for spelling, grammar, or readability. Articles longer than 300 words will be submitted to the editorial board for approval. They may be edited for length or content, in consultation with the author. Articles may be submitted as a Word document, a text file, or text in an email message.