

Monday September 3rd – Tilly / Tupper
American Association of Fish Veterinarians (AAFV)
Moderator – Thomas Waltzek (University of Florida)

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|---------|-------------|--|
| 1:15 PM | AAFV | <u>Wyatt</u> - Restoration of Lake Sturgeon as a Bioindicator Species in Rochester, New York's lower Genesee River EPA Area of Concern |
| 1:30 PM | | |
| 1:45 PM | | <u>Kebus</u> - Regulatory Fish Health Documents for Live Fish Movement |
| 2:00 PM | | |
| 2:15 PM | | <u>Gaunt</u> - Fresh from the Field: Using Antimicrobials and Veterinary Feed Directive Drugs in Aquatic Medicine |
| 2:30 PM | | |
| 2:45 PM | | Refreshments |
| 3:00 PM | | |
| 3:15 PM | | <u>Whaley</u> - Offshore Aquaculture – A One Health Approach |
| 3:30 PM | | |
| 3:45 PM | | <u>Shelley</u> - Ornamental Aquaculture Medicine in the United States – Past, Present and Future |
| 4:00 PM | | |
| 4:15 PM | | <u>Sanders</u> - The Development and Sustainability of Private Aquatic Veterinary Practice; Anesthesia, Surgery and Pain Management in Common Pet Fish |
| 4:30 PM | | |
| 4:45 PM | | <u>Giffin</u> - Canada's Aquatic Animal Health Import Program: A Global Perspective |
| 5:00 PM | | |



8th International Symposium on Aquatic Animal Health

September 2-6, 2018 - Charlottetown, Prince Edward Island, Canada



Restoration of Lake Sturgeon as a Bioindicator Species in Rochester, New York's Lower Genesee River EPA Area of Concern

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The lake sturgeon, a contemporary of the dinosaur, came swimmingly close to extirpation in Lake Ontario due to overfishing and spawning habitat degradation over the past two centuries of industrialization and exploitation. Rochester's industrial waste discharged historically into the Genesee River significantly damaged the aquatic environment of the river and Rochester embayment warranting designation in 1987 by the U.S.-Canada Great Lakes Water Quality Agreement as one of forty-three Great Lakes Binational Areas of Concern. After fifteen years of industrial waste reduction, river & watershed remediation and habitat assessments, U.S. Federal and New York State governmental agencies partnering with academic and conservation minded community organizations launched an experiment to test the health of the Genesee River by reintroducing the lake sturgeon. In 2003 and 2004, we released 1,900 hatchery-reared sturgeon to determine if the lower Genesee River would once again support this legendary, native fish. Morphometric data collected from our mark and recapture studies over the following ten years demonstrated that the sturgeon were growing at impressive rates from four inches to four feet matching healthy populations in unpolluted river systems of the Great Lakes. An EPA Great Lakes Restoration Initiative (GLRI) grant funded research where we compared blood levels of persistent chemical contaminants (PCBs, dioxins/furans, mirex, mercury, cadmium, silver and nickel) in our repatriated, ten-year old sturgeon with age-matched controls from a Lake Ontario reference tributary, the Oswegatchie River, not located in an EPA Area of Concern. Our results indicate that the blood levels of persistent chemical contaminants responsible for fish consumption advisories are attributed to lake-wide effect and not from the city's historic, industrial discharging into the Rochester Embayment Area of Concern. With such positive bioindicator data, we began a program annually releasing 1,000 hatchery-reared sturgeon into the lower Genesee River totaling 4,000 more repatriates so far. Our sturgeon restoration success and bioindicator data renew community hope and pride in our healing watershed and aquatic ecosystem.

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Presentation Format: (Oral)



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Regulatory Fish Health Documents for Live Fish Movement

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In Wisconsin, a valid “Fish Health Certificate” must be provided prior to import of live fish to Wisconsin, or introduction into waters of the state. Wisconsin has trained and listed private veterinary practitioners who are available to issue these certificates to private aquaculture, state-run aquaculture, and tribal fish hatchery producers. Wisconsin’s fish health program is administered by the Wisconsin Department of Agriculture, Trade & Consumer Protection (WDATCP), Division of Animal Health.

The WDATCP has developed a veterinary-training short-course, “Aquaculture Veterinary Medicine for Practitioners” with the UW-Madison School of Veterinary Medicine, and national fish health experts, It is an intensive program designed to provide practical training in field techniques for sample collection and field diagnostics. This course has attracted over 300 veterinarians from throughout the world.

<http://vetmedce.vetmed.wisc.edu/FishCertificate/>

A second online Fish Health Certificate Program for Fish Producers is has been developed by the Wisconsin Department of Agriculture, Trade & Consumer Protection (WDATCP), University of Wisconsin-Stevens Point, University of Wisconsin–Madison, and the Iowa State University. The course is constructed as a series of modules for fish producer leading to certification. The modules include discussions to help fish producers understand fish health testing and fish health certificates and prepare them for fish health work that may be conducted at their facility on their fish. The six modules can be taken anytime and anywhere using narrated PowerPoint presentations and supplemental reading materials delivered using new educational technology software. This online course has attracted over 500 producers worldwide.

This presentation will also discuss Certificates of Veterinary Inspection (CVI), the predominant form of health certificate for animals in the United States. These certificates are issued by accredited veterinarians for terrestrial and avian livestock to meet the requirements for animal movement throughout the country. In recent years the need for a CVI for aquatic animal movement has been discussed. Along with other aquatic animal health groups, the American Veterinary Medical Association has worked to assist in the development of a CVI for aquatic animals. This presentation will present some of the efforts in this area to-date.

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Fresh from the Field: Using Antimicrobials and Veterinary Feed Directive Drugs in Aquatic Medicine

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Use of antibiotics in food animals has been debated for decades, and in response to continued concern over antimicrobial resistance in humans, FDA issued several guidelines which revised animal antimicrobial usage. In 2012, FDA finalized the “Judicious Use of Medically Important Antimicrobial Drugs in Food-Producing Animals” (Guidance #209) which represented FDA’s thinking on antimicrobial drugs that are medically important in human medicine and also used in food-producing animals. The two main principles covered by this guidance were to (1) limit medically important antimicrobial drugs to uses in animals that were necessary for assuring animal health, and (2) include veterinary oversight on medically important antimicrobial drugs used in animals.

Another FDA guideline was Guidance #213 “Recommendations for Drug Sponsors for Voluntarily Aligning Product Use Conditions with GFI #209” finalized in 2013, to provide pharmaceutical sponsors with recommendations to voluntarily modify use of their medically important antimicrobial drug products to support the two principles in Guidance #209. These guidances changed the marketing status of antibiotics in aquatic medicine from over the counter to either a prescription (if dispensed in water) or VFD (if dispensed in feed) effective January 2017 and to withdraw production uses. Based on these guidances, FDA revised the First VFD Rule and formulated the New or Second VFD Rule.

This presentation will explore implementation of the Second VFD Rule in aquatic medicine. Although many presentations have discussed major provisions of this rule, there are still many unanswered questions from veterinarians and producers. MSU CVM has received many inquiries on the use of antimicrobials in aquatic animals which will be discussed in this presentation.

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Offshore Aquaculture – A One Health Approach

Janet Whaley

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The United States imports between 85 to 90% of its seafood from both wild-caught and aquaculture sources. This has resulted in a trade deficit of about \$14 billion in 2016. The new U.S. Administration has set a goal to increase seafood exports in order to close this gap. According to the 2016 United Nations Food and Agriculture Organization report of the State of the World Fisheries and Aquaculture, the U.S. ranks 17th in total aquaculture production despite having the one of the world's largest coastlines. Boosting aquaculture in the U.S. may meet the expanding global demand for seafood and to decrease our trade deficit. Seafood safety starts with the aquaculture farmer or fisherman and continues with the Federal government, seafood importers and exporters, retailers, restaurants, and consumers. NOAA Fisheries is one federal agency working with industry to close the gap by expanding opportunities for marine aquaculture in the open ocean. With this expansion, the opportunities for veterinarians will grow in the areas of aquatic animal health, seafood safety and conservation medicine – a One Health approach. Just like the terrestrial setting, farmer education, biosecurity, disease surveillance and reporting, and judicious use of veterinary pharmaceuticals are vital components in aquaculture all of which are key areas for veterinary involvement and leadership. When developing site-specific biosecurity plans, the veterinarian can also assess the risk of disease transfer to and from wild populations thus addressing risks to important fisheries. Another area that is ripe for veterinary involvement is public health and seafood safety where the veterinarian has the skill set to apply the hazards assessment and critical control points (HACCP) approach to mitigate risks. Finally, the veterinarian can assist with selection of sites considering relevant hazards and risks to production animals, seafood safety and wild populations.

NOAA Fisheries is currently collaborating with USDA APHIS Veterinary Services and FDA to develop guidance for ocean aquaculture farmers (finfish and shellfish) to assist them with management of aquatic animal health and seafood safety issues. The guidance supports development of site-specific aquatic animal health plans that address training and communication, biosecurity measures, disease detection and mitigation, biomonitoring and surveillance, disease reporting, disease investigation, depopulation, and follow-up activities (cleaning and disinfection). NOAA Fisheries is also working with the AVMA to further develop policy on licensing veterinarians for practice in federal waters (i.e., outside state water jurisdiction). The overall approach presented here in managing aquatic animal health in offshore aquaculture endeavors is likely to serve as a template for other U.S. offshore regions.

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Ornamental Aquaculture Medicine in The United States – Past, Present and Future

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Ornamental fish aquaculture is a multimillion dollar industry in the United States concentrated in Florida. With roots in the 1930s, Florida's weather, water, and transport hubs fostered major expansion by the 1970s. As with other burgeoning livestock industries, health and disease management became increasingly important. In the 1970s John B. Gratzek of the University of Georgia pioneered aquarium fish medicine, becoming the go-to veterinarian for Florida fish farmers. In 1987, Ruth Francis-Floyd began working with Florida producers on health issues via the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) and College of Veterinary Medicine (CVM). In 1988, extension agent Craig Watson joined Francis-Floyd at UF/IFAS to work on health and production issues. The two initiated a Fish Health Management Workshop for the ornamental fish producers in the late 1980s that is still taught to this day. In 1988, Greg Lewbart, who received training from Gratzek, began working for aquarium fish wholesaler O'Beirne Tropical in Philadelphia, PA as the first veterinarian employed full-time in the ornamental fish industry. Lewbart helped establish an import station in Naples, FL and developed contacts with the Florida fish producers. In 1992, Lewbart facilitated Roy Yanong's employment at 5D Tropical Inc. as the first full-time veterinarian employed by an ornamental fish commercial production facility. In 1995, Segrest Farms, one of the largest wholesalers in the U.S. hired veterinarian Denise Petty, who also worked with partner farms. John Slaughter worked with the industry through the University of Florida CVM from 1995-96. In 1996, under the leadership of Watson, the University of Florida opened the Tropical Aquaculture Laboratory (TAL) in Ruskin, FL; Yanong began work there as an extension veterinarian later that year. In 1997, TAL began its aquaculture veterinary student externs program. In 2003, based at TAL, Kathleen Hartman joined USDA APHIS Veterinary Services (VS) as its first field aquaculture Veterinary Medical Officer (VMO). In 2015, after Hartman's promotion to National Aquaculture Program Leader, Kat Starzel joined as an import/export VMO. Concurrently, with TAL and others, USDA APHIS VS began more targeted biosecurity programs with Florida producers. Various diseases of concern with widespread financial implications have cropped up over the years, but through veterinary involvement the ornamental aquaculture industry has been able to identify and address these issues. UF/IFAS continues to support the industry through diagnostics, research and training support; state and federal agency engagement; aquaculture training for current and future veterinarians; and by other venues including online publications, social media and webinars.

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The Development and Sustainability of Private Aquatic Veterinary Practice

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There are significantly fewer aquatic private practitioners in comparison to small and large animal veterinarians. The divide may be due to a lack of standardized education, perceived opportunities or simply not knowing how to get involved in aquatic practice. With the substantial number of pet fish, aquaculture, research and aquarium facilities, many opportunities are available for veterinarians to be involved in aquatic medicine. The journey of Aquatic Veterinary Services can offer potential aquatic clinicians an inside look at the triumphs and hurdles of private aquatic veterinary practice. Looking forward, private aquatic veterinary practice needs to involve more practicing veterinarians in order to serve the fish requiring veterinary care and oversight.

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Anesthesia, Surgery and Pain Management in Common Pet Fish

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Treatment options available to private and public aquatic veterinary practitioners expand beyond traditional medical therapy. Surgical treatment of fish has clear benefits for all fish, including common pet fish, including koi, goldfish and betta fish. With surgical treatment comes important considerations for anesthesia and pain management. Depending on the situation, anesthetic protocols can vary and practitioners need to be familiar with what is available and how to measure anesthetic depth in fish. Pain management should always be considered in a complete surgical protocol. Special considerations may be taken with patients that remain in their home tank or pond post-surgery versus remaining in a controlled hospital environment.

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Canada's Aquatic Animal Health Import Program: A Global Perspective

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Canada's import controls are designed to meet international aquatic animal health standards to protect Canadian aquatic resources (both wild and farmed aquatic animals) from the introduction of reportable, immediately notifiable and emerging diseases. Prevention of disease introduction allows Canadian exporters to maintain competitive international market access.

Canada's Aquatic Animal Health Import Program controls imports of live and dead, cultured and wild aquatic animals that are susceptible to diseases of concern to Canada and is consistent with the World Organization for Animal Health (OIE) guidelines. Import controls for susceptible species are based on the end use and the levels of controls are commensurate with the risk of introducing disease into natural populations. The Canadian Food Inspection Agency negotiates export certification requirements with exporting countries and can be specific to the animal health situation, regulatory framework, and aquatic animal health programs present in the exporting country.

Various regulatory issues and international trade issues which must be overcome to facilitate trade have included differing scope of regulations and aquatic animal health requirements, inclusion of wild animals, competent authority oversight of exports and specific test requirements. Other considerations for Canada's Aquatic Animal Health Import program have included OIE reference lab certification requirements and OIE changes in approach for determining susceptible species and diagnostic testing guidelines.

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