

The



quatic

eterinarian



*Hui Nee Chin orally medicating a stingray at Underwater World in Langkawi, Malaysia.
See related article on page 18*

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Fourth Quarter, 2014



THE AQUATIC VETERINARIAN

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Fourth Quarter 2014

WORLD AQUATIC VETERINARY MEDICAL ASSOCIATION

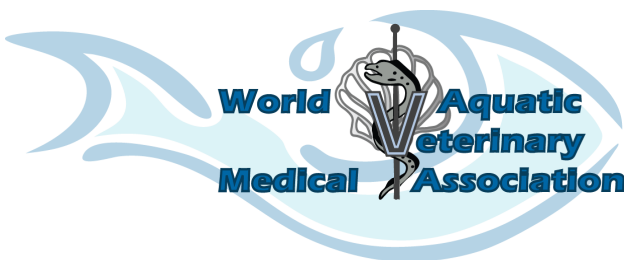
WHO ARE WE

The mission of the World Aquatic Veterinary Medical Association is to serve the discipline of aquatic veterinary medicine in enhancing aquatic animal health and welfare, public health, and seafood safety, in support of the veterinary profession, aquatic animal owners and industries, and other stakeholders.

The purpose of the World Aquatic Veterinary Medical Association is:

- To serve aquatic veterinary medicine practitioners of many disciplines and backgrounds by developing programs to support and promote our members, and the aquatic species and industries that they serve.
- To identify, foster and strengthen professional interactions among aquatic medical practitioners and other organizations around the world.
- To be an advocate for, develop guidance on, and promote the advancement of the science, ethics and professional aspects of aquatic animal medicine within the veterinary profession and a wider audience.
- To optimally position and advance the discipline of aquatic veterinary medicine, and support the practice of aquatic veterinary medicine in all countries.

The ideas presented in this publication express the views and opinions of the authors, may not reflect the view of WAVMA, and should not be implied as WAVMA recommendations or endorsements unless explicitly stated. Information related to the practice of veterinary medicine should only be used within an established valid Veterinarian-Patient-Client Relationship.



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EDITORIALS

Fourth Quarter 2014

Editor's Note

Dr Ronald J Roberts, the former WAVMA President (2008), has announced his retirement as Editor of the *Journal of Fish Diseases*, published by John Wiley Inc.

([http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1365-2761](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-2761)).



For the last 38 years as editor, Dr Roberts helped to establish the clear role of the veterinarian in fish disease research and provided a dedicated route for the dissemination of work from Aquatic Veterinary groups all over the World.

In a tribute to Professor Roberts and his work on the Journal, Dr James Winton, Director of the US Western Fish Diseases Laboratory wrote, "I hope you know how important and hugely successful your efforts have been. I am old enough to recall as a graduate student reading the earliest issues of what was the first, and still the best, journal devoted to our field. I understand that both Rod's [Dr Rodney Wootten from the UK Government Marine Laboratory in Aberdeen] passing and the impending changes to the Journal have driven your decision, but I want you know how much all of us in the fish health field appreciate the countless hours you and Rod devoted to the effort."

Dr Hamish Rodger wrote, "Your global vision and ambition to ensure vets were involved and a focus for fish health was the starting point and driver for so many of us; others you managed to either push or drag into the arena, and for this we salute you!"

Professor David Speare of the Atlantic Veterinary College, Prince Edward Island, Canada has been appointed new Editor of the *Journal of Fish Diseases* from 1st January 2015. Dr Speare has been a member of the Editorial Board and a most assiduous and willing referee for the Journal for many years.

Dr Roberts wrote in the December issue of the Journal, "When, in late 1975, I met with Robert Campbell and his colleague Nigel Palmer, in the Edinburgh offices of Blackwell Scientific to discuss the possibility of producing the first fully peer-reviewed, English language, scientific journal on the subject of fish diseases, I certainly did not expect to be still editing such a journal nearly forty years later."



Professor Ron Roberts PhD FRCVS FRCPath FRS (Edin)

Dr Roberts will still work on a number of other things in the field, but this does mark the end of an epoch for him. Along with the other Aquatic Veterinarians worldwide, I would like to thank Dr Roberts for all his efforts on our behalf for his work in the expansion and dissemination of veterinary knowledge for the betterment of aquatic animals everywhere.

Perhaps he would now like to join us working on *The Aquatic Veterinarian*!

Best wishes for a Successful New Year to all Aquatic Veterinarians and their families.

Nick Saint-Erne, DVM, CertAqV
Executive Editor
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I saw these in a store. Not good for the Aquatic Veterinary business!

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EXECUTIVE REPORTS

Fourth Quarter 2014

President's Report

Dear Colleagues,

This will be my final official address as President of the WAVMA. I remember that when I first accepted the post, a colleague warned me that it would be like "herding cats". Thankfully, we are an aquatic organisation and I wasn't dealing with cats; we were "catfish"! And like many other fishes, we don't need to be herded, we just naturally "school" together. It has truly been a pleasure to serve you, and to meet with many of you along the way.

What have we achieved this year? Remembering, the 3 areas highlighted for improvement were: relevance, pre-eminence and reach.

For "relevance": I believe we have been able to satisfy the needs and wants of our global membership, through support via Listserv discussions, building competence and confidence through sourcing excellent speakers for the WebCEPD, recognition of prior experience through the Certified Aquatic Veterinary Program (I'm continually being humbled by the breadth and depth of experiences our members bring to our community), our beautiful quarterly publication (*The Aquatic Veterinarian*).

Under "pre-eminence": I believe our WAVMA brand is being recognised by many veterinary and non-veterinary organisations. How did we do this? We have been actively broadcasting our WAVMA WebCEPD sessions, we continue to have a physical presence at key international conferences (e.g. WSAVA, WVA, IAAAM, FAVA, AVMA), through continued sponsorship for the aquatic veterinary scholarships, as well as articles written by WAVMA-identifiable members appearing in more publications.

And finally, "reach": We have been engaging in open dialogue with other organisations such as through the International Aquatic Veterinary Council (IAVC), continued relationship with the Aquatic Animal Health Chapter of the Australian & New Zealand College of Veterinary Scientists and have been enlisting more and more WAVMA Student Chapters. To date, we have more than 620 veterinarians and veterinary technicians/nurses (from over 50 countries) who have become members. This year alone, there were more than 100 new applicants.

All these achievements are yours, and it makes me proud to be part of this great organisation made up of many supportive colleagues. It is truly a team effort and it takes extreme dedication. I'd like to



Aquatic veterinarians celebrating at the AVMA Convention in Denver, Colorado July 2015.

take this opportunity to thank our Executive Board Members, especially those who either had to wake up at 4am, or stay up till 3am in their time zones for our virtual meetings. I'd also like to thank our members who make up the various other committees, for giving your time to the cause. The most enormous tasks are the behind-the-scenes work for the WebCEPD and our quarterly publication, *The Aquatic Veterinarian*. Thank you all for your interest, enthusiasm and great contributions. For a bit of fun, we've also increased the range offered in our online store of WAVMA paraphernalia.

Though my tenure will be ending soon, I will continue to work in the background, supporting the new Executive Board, and with the team to deliver more WebCEPD seminars, and will re-join the Communications Committee. I look forward to being of continued service to WAVMA. Now I hand over the reigns to Dr Chris Walster and the new Executive Board to lead us into the future.

One last pitch from me... Are you thinking of serving our WAVMA, but don't have the time? Someone once said, "If you want something done, give it to the busiest person." So, if you're busy and enthusiastic, we want you!

Yours sincerely,

Dr Richmond Loh

WAVMA President

*DipProjMgt, BSc, BVMS, MPhil (Pathology),
MANZCVS (Aquatics & Pathobiology), CertAqV,
CMAVA, NATA Signatory.*

Certified Aquatic Veterinarian

<http://www.thefishvet.com.au>

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Secretary's Report

In my first report as WAVMA secretary, I reiterated that fact that by virtue of our organization being founded in the Chinese year of the Dog and 2014 corresponding to the Chinese year of the Horse that the fortune of the "dog people" will improve in 2014. I am happy to say that I believe that prediction has indeed materialized. This was only possible however, due to the leadership we were privileged to have and members in general who work assiduously together to make that materialize.

The year 2014 has seen an enhancement of the benefits offered as an association and as we enter into 2015 your suggestions on how we can be of better service to you would be highly appreciated. With a new Executive Board in place, I have no doubt that it will continue the noble work that has been ongoing and initiate new projects as well. One of the privileges we have at WAVMA is that the past, current and future presidents serve on the board and this allows for continuity, support and advice based on past experiences.

The year 2014 saw more persons becoming CertAqV certified and many persons who have completed the program now function as mentors, and/or are WAVMA Fellows. If this trend continues, it can certainly be deemed as one of our most important member benefits since it fills a void that exists in most parts of the world.

We continue to see a constant increase in new student members and I personally believe that the New Year ahead should focus resources and attention on the needs of students. Against this background, it is expected that a student led committee will be up and running during the new year and I am certain that the President Elect will be supportive of this endeavor. Suffice it to say that new student chapters continue to be formed and this certainly will assist in WAVMA being of relevance within the academic environment which hopefully would translate into further enhancement and attention to aquatic veterinary medicine in veterinary schools globally. In the same breath, the webinars that have been offered so far and would continue into the New Year will hopefully contribute to the knowledge base of our student members as well.

Finally, I close with our collaborative efforts, which I always consider to be of utmost importance. Many such endeavours has helped to



guarantee that aquatic medicine is placed on the agenda and in many such cases, without the involvement of WAVMA, would have been missing. The AVMA Annual Convention, which took place in Denver, Colorado, USA from July 26-29, 2014 is one such example where 4 days of aquatic sessions were held. Our president Dr. Loh has made presentations at the Federation of Asian Veterinary Associations Conference from 28-30 November, 2014. And one of the major occurrences will occur in Bangkok from May 15-18, 2015, where WAVMA will conduct the first Aquatic sessions ever to be held in a WSAVA congress.

As I close allow me to congratulate the new Executive Board that will lead us in 2015 and thank the Executive Board that has served us in 2014. I wish you and yours all the best for the festive season and a prosperous New Year.

Devon Dublin, DMVZ, MSc. CertAqV
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PRIVILEGES & BENEFITS OF WAVMA MEMBERSHIP

Aquatic Veterinary e-Learning

Supporting WAVMA's WebCEPD, PubCEPD
CertAqV & Clinical Cases Programs.



- Enjoy on-line e-Learning programs & courses to advance your knowledge & skills
- Get continuing education credit through *Web-CEPD, PubCEPD & Clinical Corner*
- Discover core knowledge, skills & experience needed to become a WAVMA Certified Aquatic Veterinarian (*CertAqV*)
- Receive *discounted* subscriptions to publications & meetings
- Utilize WAVMA's picture & video libraries for your own presentations
- Join *listservs* to discuss clinical cases & other issues
- Mentor & be mentored to expand your and other's skills
- Publish your articles in WAVMA's quarterly journal: *The Aquatic Veterinarian*
- Find world-wide externships, internships, residencies & jobs in all aquatic vet areas
- Access *Member Directories* & have your Clinic/Hospital listed on-line
- Benefit from *Educational grants* for vet students & new veterinary graduates
- Form & participate in *veterinary school chapters* throughout the world
- Participate in veterinarian and client surveys
- Help build additional member programs by serving as an Officer, Director or Committee Member

WAVMA Committees

As a member-driven organization, WAVMA relies on volunteers to help implement programs useful for all members. Any WAVMA member can volunteer on a Committee to help shape the direction of the Association, meet new colleagues, forge valuable and lasting relationships, and help address key issues affecting aquatic veterinary medicine today. To find out more about serving on a Committee, please contact the Committee Chair or the WAVMA Parliamentarian.

Budget and Finance Committee

This Committee develops and regularly revises the Association's annual budget and assists the Treasurer, as necessary, in developing the Association's annual financial reports and tax materials.

This Committee shall consist of the Treasurer (Chair); the President-Elect; and one other member of the Executive Board who will volunteer to serve a one-year renewable term.

Communications Committee

This Committee manages the communications among members and others involved with aquatic veterinary medicine. It oversees the listservs, membership lists, publication of WAVMA's quarterly journal *The Aquatic Veterinarian*, Facebook, Twitter, LinkedIn and other social media accounts.

Credentialing Committee

This Committee oversees and administers the CertAqV Program for credentialing aquatic veterinary practitioners, and evaluates aquatic veterinary educational programs useful to members.

Meetings Committee

This Committee oversees and coordinates logistics for WAVMA-organized or sponsored aquatic veterinary educational meetings, including the Annual General Meeting.

Membership Committee

This Committee oversees membership issues to optimally serve individual members and the organization.

Student Committee

This Committee facilitates networking between student members and helps development of student programs and services.

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Communications Committee WAVMA's New e-Learning System

The World Aquatic Veterinary Medical Association (WAVMA) is pleased to announce its membership in the World Continuing Education Alliance (WCEA), a network of veterinary organizations and other educators that will serve as a source of web-based Continuing Education and Professional Development (CEPD) for veterinarians, veterinary students and veterinary technicians/nurses around the world.

Spearheaded by the World Veterinary Association (WVA) in forming this network, participating veterinary Associations, Universities, Training Organizations and others that join the Alliance, will now have the opportunity to produce and share educational and training resources, and create the largest repository of veterinary CEPD in the world – and make it available to every Veterinary Association that is a member of WCEA.

Using common e-Learning and Content Management Systems (LMS/CMS) the WCEA provides every member the opportunity to utilize CEPD resources produced anywhere. It also accommodates CEPD requirements and needs that may vary from country to country. While each veterinary organization in the Network can create, run and manage its own CEPD program, the LMS allows the WAVMA to share their CEPD with, and draw on CEPD programs developed by other members of the [World Veterinary CE Network](#).

As a member of this Network, using this LMS/CMS, WAVMA can now offer its members the most cost effective and sophisticated e-Learning system currently available. As WAVMA's new e-Learning system is refined, it will provide options for WAVMA, its members, and other allied aquatic veterinary organizations the ability to:

- Access WAVMA's e-Learning system using a "single sign on" through the WAVMA website
- Make CEPD from other Alliance or network providers available to WAVMA members
- Store and access all CEPD earned through the network (and to upload CEPD credits and certificates earned from other sources)
- Establish and monitor the amount of CEPD required for veterinary re-licensing, registration or other credentialing systems



- Link to national or other CEPD accreditation or verification systems that require annual CEPD
- Use a discount coupon and choice of payment gateways for each CEPD opportunity
- Share CEPD content with other selected WAVMA-allied organizations
- Split income between WAVMA, CEPD authors, and WAVMA-allied aquatic veterinary organizations that develop CEPD
- Provide aquatic veterinary branded CEPD portals to WAVMA-allied veterinary organizations to develop their own CEPD that can be offered to a global audience.

The first CEPD program to be incorporated into this new WAVMA e-Learning system, and available to WCEA members around the world, is the WAVMA WebCEPD Program – a series of educational webinars, given by WAVMA members, on important aquatic veterinary topics of interest to veterinarians, veterinary students and veterinary technicians/nurses. After beta testing other programs, they will be incorporated into the WAVMA e-Learning system, such as the PubCEPD Program that will provide CEPD credit for studying peer-reviewed publications on important topics necessary for practicing aquatic veterinary medicine.

For more information go on these developing programs, go to www.wavma.org/Education or contact administrators@wavma.org.

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Fellowship Advisory Council

WAVMA has established a fellowship program to recognize those world-renowned veterinarians who have advanced aquatic veterinary medicine as a discipline and devoted their time and efforts to serve WAVMA's mission. The Fellowship Advisory Council allows Fellows to provide direction on WAVMA scientific activities; advise the Executive Board with guidance on activities and initiatives, and mentor applicants for Aquatic Veterinarian Certification (CertAqV).

Our WAVMA Distinguished Fellow are:

Dr. Peter L. Merrill
Dr. Ronald J. Roberts
Dr. A. David Scarfe
Dr. Julius M. Tepper
Dr. Christopher I. Walster
Dr. Dusan Palic
Dr. Grace Karreman
Dr. Marian McLoughlin

See: <http://www.wavma.org/wavma-fellows.cfm?>

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Credentialing Committee

The WAVMA CertAqV Program is administered by the WAVMA Credentialing Committee, along with the assistance of other Certified WAVMA members who serve as mentors and adjudicators.

To be credentialed by WAVMA as a Certified Aquatic Veterinarian and utilize the CertAqV honorific, individuals must be a WAVMA member, have a veterinary degree from a nationally recognized veterinary school, college or university and have demonstrated general knowledge and competency in core subject areas that are currently considered necessary to practice aquatic veterinary medicine. Students of a nationally recognized veterinary institution of higher education can register for the program, but will not be certified or entitled to utilize the CertAqV honorific until they graduate.

Individuals that desire to participate in the WAVMA CertAqV Credentialing Program are required to:

- Register for the Program (application at www.wavma.org or contact the [WAVMA Administrators](#)).
- Identify a mentor to assist the registrant through the Program. The potential mentors would be any available WAVMA Certified Aquatic Veterinarians.
- Provide the mentor with written evidence of satisfactory completion of each of the core Knowledge, Skills and Experience (KSE) subject areas.
- Be adjudicated by the Credentialing Committee for recognition of completion of all KSE requirements after the mentor has approved the documentation.
- Have the CertAqV certification approved by the WAVMA Executive Board

The WAVMA Certified Aquatic Veterinarian (CertAqV) program has now certified twenty-three aquatic veterinarians. Please welcome our latest Certified Aquatic Veterinarians:

Dr James Bogan, DVM, CertAqV
Dr Johnny Shelley, DVM, CertAqV

There are an additional eleven WAVMA members currently in the process of being certified.

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COMMITTEE REPORTS

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Membership Committee

This short note will give you a flavor of what membership committee of WAVMA does on your behalf. But first a little history....

The Membership Committee was established in January 2013 to assist the Executive Board on membership issues to optimally serve individual members and the organization.

So what do we do? We get involved in a number of process or administrative issues like... 'how much should we charge for an annual membership fee?' or 'how do we establish a life membership category.' At first glance you might think that it would be simple: just total up the number of members, work out how much it costs to run WAVMA and divide the second figure by the first figure. However you'd be wrong. What do we do about student members? What do we do about people from countries where even a week's wages won't cover the cost of membership?

We look at these issues, discuss the facts, consider options and then make recommendations for the Executive Board of WAVMA to consider. We also spend time on more strategic items, like how we interact with other aquatic veterinarian organizations around the world, how do we encourage membership retention and how do we increase membership.

I keep mentioning 'we'. There are a few of us on this committee. Our team comprises Nike Adeyemo (Nigeria, but is currently working in Florida), Laura Urdes (Romania), Stephen Pyecroft (Australia), David Scarfe and Julius Tepper (USA) and Chris Walster and myself, Lydia Brown (UK).

As you might imagine we never meet in person! We have electronic meetings using GoToMeeting (another WAVMA service) which normally do not last more than 2 hours and these take place a few times a year.

Why am I telling you all of this? Well I hope I am making it sound fun and useful. If you are interested in serving on our committee, or any other WAVMA committee for that matter, please get in touch with David Scarfe (dscarfe@avma.org) who would be pleased to talk through with you the options available for you.

Lydia Brown MBE FRCVS
Membership Committee Chair
drlydiabrown@gmail.com

Membership Committee

Members are the life-blood of any professional Association. Please join us in welcoming the following new WAVMA members:

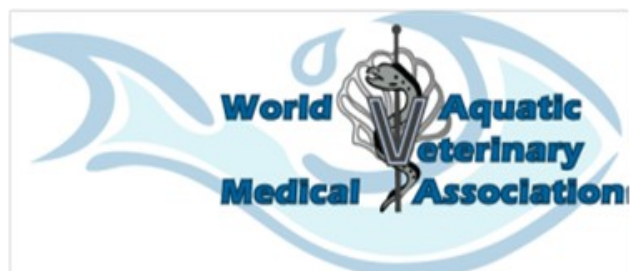
New Members (October 1-December 31, 2014)

Full Members (Veterinarian)

Howard K-H Wong
Naoya Matsumoto
Tim Barbe
Erica B MacKinnon
Brian Joseph
Sandra Fazakas
Maria Serran
Donna J Kelly

Student Members

Jamie Perkins
Katherine Haman
Asmita Lamichhane
Kurt Arden
Traci M Davis
Sophie Goodall
Blair E Hamacher
Anirily E Solivan Diaz
Melissa A Cuerda Sanchez
Caroline A Brown
Jacqueline E Elliott
Jennifer Lucas
Catherine L. Wyre
Sarah J Knowles
Aimee Reed
Kaitlyn Krizmanich
Mykolas Kamaitis
Kaylee Kristen Perry
Christy Cox
Jennifer Engelhard
Julianne Richard
Lori S Westmoreland



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The WAVMA store is open!!!

The **WAVMA Online Store**, located at: www.zazzle/wavma788 is ready for your orders. This retail platform allows you to purchase some really neat gear with either our WAVMA logo or swoosh to help support our association. A portion of the cost is returned to WAVMA directly. The items you see on display were created to give you a small sampling of the hundreds of combinations available. You may order any item in different sizes and color combinations as listed for each item.

You may also add your business logo or student chapter logo, along with your name. Or simply add a personalized title or phrase. Also note that in many color combos, our logo shows up framed in white. I have been assured that on the clothing ordered in color, the background of the logo will be clear, not white. If you see an item you would like with our logo or swoosh that is not yet pictured, please contact me at cypcarpio@aol.com and I will set it up.

Also, please remember we have **white logo polo shirts** and **member self-stick window decals** in stock and available for order on our wavma.org website. Click on the shop tab to order these items.

Mug with WAVMA logo
\$15.95 per mug



WAVMA Ladies V-neck tee \$24.95



WAVMA 2014 R. Loh Tee shirt \$20.95



Sport Tek long sleeve WAVMA shirt \$29.95

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COMMITTEE REPORTS

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Communications Committee

The new version of the WAVMA brochure is now ready and available for further distribution. It comprises updated information about the membership categories, current and future programmes available for WAVMA members, as well as other useful data, such as sources for getting credit and recognition of life-long learning activities.

Laura-Daniela Urdes DVM PgDip PhD CertAqV
Communications Committee Chair
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Meetings Committee

As 2014 draws to a close, we look back on a reduced but very successful meetings program having been completed this year by the presence of our president, Richmond Loh as the representative of WAVMA speaking about aquatic medicine at the 18th Federation of Asian Veterinary Associations Congress on November 28-30 in Singapore. And while in Singapore, he will be presenting to other bodies including Temasek Polytechnic, Ngee Ann Polytechnic, National University of Singapore, the Singapore Association for Laboratory Animal Science, Agri-Food and Veterinary Authority of Singapore and the Fish Quarantine Inspection Agency of Indonesia.

In keeping with president Loh's vision (and thanks to Dr Dublin's networking) to expose more Asian vets to aquatic medicine and WAVMA, we will continue to have a strong presence in 2015 in Asia. A group of our members will present aquatic medicine lectures as part of our co-sponsoring at the World Small Animal Veterinary Association Congress, to be held May 15-18, 2015 in Bangkok, Thailand. If you are planning to attend, please let me know so we may begin making arrangements for our social events.

As to the rest of the meetings scheduled for 2015, our next president is currently in the process of exploring several interesting possibilities for additional meetings and our annual general meeting, and I will have more information available in the next addition of *The Aquatic Veterinarian*.

Julius M. Tepper
Meetings Committee Chair
cypcarpio@aol.com

AVMA Aquatic Veterinary Committee Liaison Report

As the WAVMA representative to the Aquatic Veterinary Committee of the AVMA, I traveled to AVMA headquarters in Schaumburg, IL on Oct. 10-11 for the biannual meeting. My report to the committee included an invitation by WAVMA for the AVMA to join the newly formed International Aquatic Veterinary Council. This invitation was preceded by a letter sent by our president, Dr. Loh outlining the goals of the Council.

The meeting went very well. The letter from Dr. Loh elicited many questions, with several members expressing support for the principles outlined in my discussion. Afterwards, the vote was unanimous to join with no long term commitment.

I also had the fortuitous opportunity to meet separately with Dr. Steve Smith, President of the American Association of Fish Veterinarians, who has since also received our letter of invitation for that organization to join. He was interested in the concept and will discuss it with their Executive Board. (Two members of that Board happen to be on the AVMA AqVMC). We await their decision.

In other matters, the committee decided to support the placement of the combined WAVMA/AVMA AqVMC booth at the IAAAM 2015 meeting in Chicago. This was based on a \$1500 sponsorship, which includes the table (= booth) and asked if WAVMA would also contribute to the booth cost. The WAVMA Executive Board will decide on this donation at their next meeting.

The next meeting of the AVMA AqVMC will occur in the Spring of 2015.

Julius M. Tepper
WAVMA Representative to the AVMA
cypcarpio@aol.com



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AUTHOR'S INSTRUCTIONS

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Instructions for Authors and Contributors

While any information relevant to aquatic veterinary medicine might be published, we particularly invite contributions for the following regular columns in *THE AQUATIC VETERINARIAN*:

Colleague's Connection

An article explaining why and how a veterinarian became interested in aquatic veterinary medicine and what that veterinarian has done in their aquatic veterinary career.

Peer-Reviewed Articles

Original research or review of any aquatic veterinary topic. Articles will be reviewed by 3 veterinarians and comments and changes referred back to the author prior to publication. The text for an article begins with an introductory section and then is organized under the following headings:

- Materials and Methods
- Results
- Discussion (conclusions and clinical relevance)
- References (cited in the text by superscript numbers in order of citation).

Clinical Cases

Clear description of a distinct clinical case or situation and how it was resolved. These may be submitted for peer-review. Begin with the signalment (species, age, sex, body weight or length) of the animal or animals, followed by a chronologic description of pertinent aspects of the diagnostic examination, treatment, and outcome, and end with a brief discussion.

Book Reviews

Brief review of a published book, including an overview and critique of the contents and where to obtain the book.

Publication Abstracts

Abstracts of published veterinary and scientific journals with full citation/reference (authors, date, title, and journal volume and page numbers – ½-1 page).

News

Brief synopsis or information about aquatic veterinary news published elsewhere. List original source of information.

Legislative & Regulatory Issues

Synopsis or description of emerging legislation or regulations with information on how to access further detailed information or a link to website.

Meetings and Continuing Education and Professional Development (CE&PD) Opportunities

Description or synopsis of upcoming aquatic veterinary or (veterinarian-relevant) non-veterinary in-person or on-line educational meetings noting the meeting title, dates, location, and contact person or website.

Jobs, Internships, Externships or Residencies

Description with specific contact information for veterinary student externships and post-graduate internships or residencies at private practices, institutions, universities or organizations. Description of available full or part-time employment for aquatic veterinarians, with contact information.

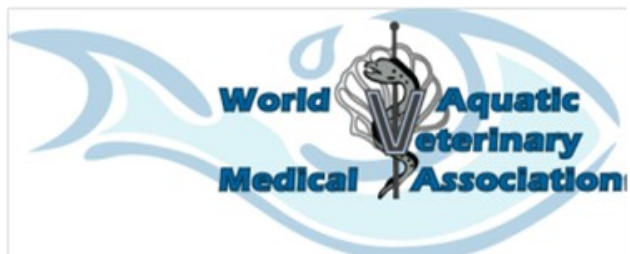
Please send articles, clinical reports, or news items to the editor by the following submission dates:

- Issue 1 – February 15 (published in March)
- Issue 2 – May 15 (published in June)
- Issue 3 – August 15 (published in September)
- Issue 4 – November 15 (published in December)

All submissions should be in 10-point Arial font, single spaced. Submissions may be edited to fit the space available.

We can also use editors to proof-read submissions or review articles. Please contact the Editor if you are interested in assisting.

The World Aquatic Veterinary Medical Association also has opportunities for members to assist with committees. Contact any member of the Executive Board to volunteer to help.



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Student Chapter Report: Western University of Health Sciences, College of Veterinary Medicine

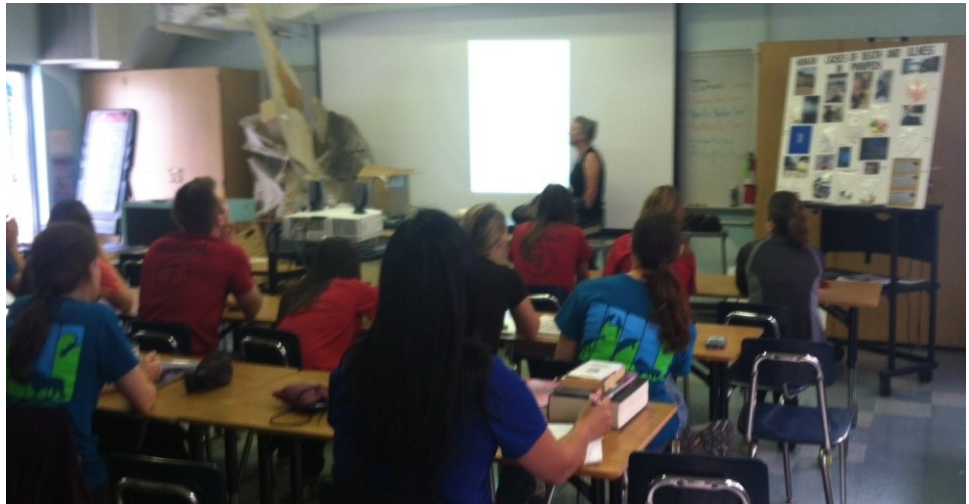
The student chapter of WAVMA at Western University of Health Sciences, College of Veterinary Medicine is currently in its first year! We are located in Southern California, which has proven to be a great place to study aquatic animal medicine. So far this year, we have hosted speakers, organized field trips, and created fundraising events to support our learning.

This fall, Dr. Forrest Gomez from the National Marine Mammal Foundation visited us and described the function of the Navy Marine Mammal Program and the roles of veterinarians at the facility. The club also visited the Marine Mammal Care Center in San Pedro, California to learn about marine mammal stranding and rehabilitation from Dr. Lauren Palmer.

Students of this chapter have come from around the country and have a variety of aquatic animal experiences. The opportunity to be student members of WAVMA has given us the ability to network with other students and professionals involved in aquatic animal health while also following cases discussed on the WAVMA listserv. Furthermore, a few of us are quite interested in applying for the WAVMA Certified Aquatic Veterinarian Credentialing Program during our 4th year. Everyone here would like to thank the parent chapter for fostering our passion for aquatic medicine. Going forward, our next goal is to gain more exposure to aquaculture management and medicine in year two!

Emily J. Trumbull (President, Class of 2017)

Seminar by Dr. Lauren Palmer (Marine Mammal Care Center, San Pedro, CA)



**From left to right:
Therese Bruno
(Event Coordinator),
Ashley Keeley
(Treasurer),
Emily Trumbull
(President),
Dr. Forrest Gomez,
Alex Confer**

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Current WAVMA Student Chapters:

Murdoch University, School of Veterinary & Life Sciences (established 2014)

Faculty Advisors - Drs. Lian Yeap & Richmond Loh. **Chapter contact** – [click here](#)

Auburn University, College of Veterinary Medicine (established 2013)

Faculty Advisor - Dr. Ray Wilhite

Chapter Contact - [click here](#)

St. George's University, School of Veterinary Medicine (in development)

Tuskegee University, School of Veterinary Medicine (established 2012)

Faculty Advisor - Dr. Kenneth Newkirk

Chapter Contact - TBA

University of Florida, College of Veterinary Medicine (established 2013)

Faculty Advisor - Dr. Tom Waltzek

Chapter Contact - TBA

University of Illinois, College of Veterinary Medicine (in development)

University of Prince Edward Island, Atlantic Veterinary College (in development)

University of Tennessee, College of Veterinary Medicine (established 2012)

Faculty Advisors - Dr. Michael Jones & Dr. Debra Miller **Chapter Contact** - [click here](#)

View the Chapter's [Facebook](#) page

University of Wisconsin, College of Veterinary Medicine (in development)

Western University of Health Sciences, College of Veterinary Medicine (established 2014)

Faculty Advisor - Dr. Suzana Tkalcic

Chapter Contact - [click here](#)

University of Nottingham, School of Veterinary Medicine & Science (in development)

University of Sydney, Australia (NEW)

For information or assistance, please contact the [WAVMA Chapter Coordinator](#)

To initiate a new Student Chapter see the "Guidance for Forming a New Student Chapter" ([click here](#) to download PDF).

SCHOLARSHIP COMMITTEE:

2014 WAVMA/AVMA/AVMA Aquatic Veterinary Educational Grant Recipient Reports

Jayme Hennenfent, DVM, MS –

University of Illinois College of Veterinary Medicine, Class of 2014

Thanks to an award from the 2014 WAVMA/AVMA Aquatic Medicine Education Grant Program, I had the opportunity to travel to the 7th International Conference on Aquatic Animal Health held in Portland, Oregon, August 31st- September 5th.

While there, I presented on the topic of an ongoing project I became involved in while completing an externship at the American Veterinary Medical Association's headquarters in Schaumburg, Illinois earlier this spring. The project aims to survey all AVMA-COE accredited veterinary schools on currently available aquatic medicine courses at each institution.

With aquaculture filling an increasing demand for seafood from a growing global population, the future need for an aquatic medicine veterinary workforce is evident. Because educational programs in aquatic medicine are often not a part of core veterinary curriculum, a comprehensive study is needed to gain knowledge of the scope of our current system of providing veterinarians with skills and knowledge in aquatic animal medicine. Based on this study, the profession will be better able to establish future regional and national programs of education and certification in aquatic medicine as needed.

In addition to presenting at the conference, I had the chance to attend keynote presentations, many presentations in the continuing education program track, connect with colleagues from AQUAVET 2013, and meet new colleagues from both inside and outside of the US. It was especially interesting to discuss aquatic education with students studying outside of the US, to hear a different perspective.

I want to sincerely thank WAVMA and AVMA for the opportunity to participate in this experience. I am always amazed at the talent, experience and enthusiasm of the aquatic health profession, and this meeting was a great showcase of this once again. Special thanks also to Dr. David Scarfe of the AVMA and Dr. Bill Van Bonn of the Shedd Aquarium for their support in my project and scholarship application.

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SCHOLARSHIP COMMITTEE: 2014 WAVMA/AVMA/AVMF Aquatic Veterinary Educational Grant Recipient Reports

Barbara Linnehan -

University of Florida,
College of Veterinary Medicine, Class of 2015

Greetings, fellow aquatic veterinary medicine enthusiasts! I would like to extend a tremendous thank you for to the WAVMA, AVMA, and AVMF for awarding me an Aquatic Veterinary Scholarship, which enabled me to complete two marine mammal externships during the summer of my 4th year at University of Florida CVM. Through these two externship opportunities, I was able to delve into aquatic animal medicine and greatly expand my knowledge and technical skills.

My first externship took place in June 2014, at The Marine Mammal Center (TMMC) in Sausalito, CA. TMMC is dedicated to the rescue, rehabilitation, and release of hundreds of marine mammals along 600 miles of California's coast, as well as research and education. During my 4-week externship at TMMC, I had the pleasure of working alongside Dr. Shawn Johnson and Dr. Greg Frankfurter and participated in performing physical exams, blood collection, diagnostic procedures such as ultrasound and radiography, as well as surgical procedures on Northern elephant seals, California sea lions, and Pacific harbor seals. I also gained experience in necropsy and releasing rehabilitated sea lions back into the wild. My experience at TMMC was absolutely incredible. I learned more than I thought possible on every aspect of pinniped medicine and got an incredible amount of valuable, hands-on experience with the high caseload.

TMMC is a truly unique and inspirational place. It is largely run by hundreds of volunteers and several dozen paid staff; each individual at TMMC truly wants to be there and their passion and enthusiasm for marine mammal conservation is evident. During this externship, I became intrigued about the use of antiepileptic drugs in pinnipeds and researched current protocols for antiepileptic drugs in pinnipeds and other mammal species as part of my extern project and presentation. There is a paucity of literature regarding pharmacokinetics of antiepileptic drugs in pinnipeds; therefore, in collaboration with TMMC and my professors from UF CVM, we began a study to investigate the pharmacokinetics of intramuscularly injected phenobarbital in California sea lions. This study is currently ongoing and is



Barbara with a dolphin at The Navy Marine Mammal Program, practicing husbandry behaviors.

aimed at guiding treatment protocols for sea lions undergoing treatment for seizures related to domoic acid toxicity.

For my second marine mammal externship, I completed 4 weeks at The Navy Marine Mammal Program in San Diego, CA (NMMP) during July 2014. The NMMP is dedicated to the development, training, and veterinary care of marine mammals used for national defense, and also conducts a large amount of research in marine mammal and translational medicine.

During my externship, I participated in many facets of preventative medicine and veterinary treatments with bottlenose dolphins and California sea lions, such as physical examinations, diagnostic imaging such as endoscopy, radiography, and ultrasonography, reproduction medicine, and many other procedures. Working with the incredible team of Dr. Forrest Gomez, Dr. Jenny Meegan, Dr. Lara Cotte, and Dr. Marina Ivancic, I learned a great deal about cetacean medicine and the importance of integrating medical care with behavior and training in these highly intelligent and skilled animals.

The quality of medicine practiced at NMMP was astounding, as well as the amount of valuable research that is conducted in a wide variety of subjects. For my extern project, I helped Dr. Sam Ridgway with a few of his ongoing studies. This included filming dolphins underwater as they caught and ate fish in order to demonstrate the "victory squeal," photographing dolphins underwater to examine their ability to see their own reflection on the surface of the ocean, and dissecting a beluga cadaver to examine the intricate air sac apparatus associated with the blowhole.

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Working alongside The Dolphin Doctor was a wonderful experience that I will never forget. This work resulted in a published peer-reviewed article and video: S. H. Ridgway et al (2014). Forward Shift of Feeding Buzz Components of Dolphins and Belugas during Associative Learning Reveals a Likely Connection to Reward Expectation, Pleasure and Brain Dopamine Activation. *J. Expt. Biol.*, 217 (16): 2910–19.

These externships were incredibly valuable in helping me expand my knowledge and technical skills in the field of aquatic animal medicine. I would like to again thank the WAVMA, AVMA, AVMF for the Aquatic Veterinary Scholarship, as well as the hosting institutions for granting me these wonderful learning opportunities, for which I am truly grateful.



Zac Waddington working with the fish at a sea food production facility in Western Canada.



Zac Waddington – University of Saskatoon, Western College of Veterinary Medicine, Class of 2015

In July of 2014, I was fortunate enough to win a scholarship from the World Aquatic Veterinary Medical Association to fund an externship exploring finfish farming on Canada's

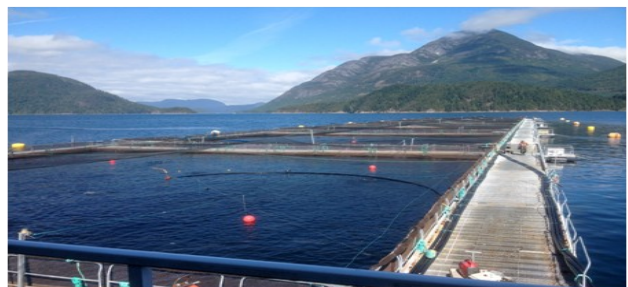


west coast. Aquaculture in Canada (and particularly on the west coast) is very controversial. My hope was that this experience would help me learn the facts surrounding fish farming and a veterinarian's role in the industry.

I was able to work with the veterinarians in the federal government in charge of regulating aquaculture, veterinarians employed by industry, fish pathologists and private contractors. The 4-week externship was incredibly eye opening and I gained a new found appreciation for the level of care and efficiency in the industry.

Becoming is "fish vet" is now a career option that I am seriously considering and was so fortunate to have been able to work with some wonderful veterinarians and biologists. People were so patient in answering my many questions, and happy to show me the various aspects of the industry; from the hatchery, to the sea sites, to the processing plant. The ability of fish farming to efficiently produce high quality food in a sustainable manner is unrivalled in my opinion, and I am very intrigued at the possibility of working in such a growing and diverse field of food production.

I want to say a big thanks to everyone who made this scholarship possible, which in turn allowed me to have this incredibly educational and life-changing experience. The pictures illustrate some of what I was involved with.



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The Tropical Island Internship — Hui Nee Chin

I am currently a fourth year student at Murdoch University College of Veterinary Medicine in Perth, Australia. As I am in my final clinical years, it is a requirement to complete a certain number of clinical practicals as part of the curriculum. I was lucky enough to be accepted for a one month internship at Underwater World Langkawi, Malaysia. During my time there I was able to spend three days within each different habitat, ranging from rainforest to Rockhopper penguins. Here I was able to learn the various husbandry techniques, whilst shadowing the in-house veterinarian. This sure did keep me busy during my four week 'mid-semester' break from university! However, this opportunity was invaluable as it exposed me to a wide range of cases that your typical clinical practical would not provide.

The first challenging case was a chronic 6 month infection of the shell of a Mata-Mata turtle. This was the topic for my paper written as part of the internship. The turtle presented with anorexia and soft lesions on the shell and carapace. The lesions were pigmented and had a mould-like appearance. Despite various treatments with antibiotics and antifungals, there had been no improvements observed. Upon my arrival I suggested taking a deep sample of the lesion for cytology and culture. With the limited resources at hand, a non-incubated culture and wet mount microscopy was performed. From this we discovered what looked like a fungus and with the help of the WAVMA community was able to suspect a possible phaeocephomycosis infection.

When taking the deep sample of the lesion, we discovered that it was mainly necrotic material and the decision was made to attempt to fully debride the lesions. It was astonishing to see how extensive each lesion was affecting the carapace and plastron. After debriding each wound, topical miconazole was applied, and the wound was covered with a waterproof dressing. During the last week of my internship, we undressed the debrided lesions to discover presence of fresh granulation tissue! Hopefully this turtle will be able to make a full recovery.

I was also able to help with the monthly physical check ups of the African and Rockhopper penguins. This involved individually weighing, measuring body condition score, performing an oral exam and examining for signs of bumble foot. This was a great time for me to learn different methods of avian restraint.

Rock-hopper penguins



The African penguins sure put my reflexes to the test!

Kisses from a fur seal!



Other exciting things I was able to take part in were: taking a gill biopsy from a white tip reef shark, giving a stingray oral antibiotics, performing a physical exam on a fur seal and learning how to take fish and penguin blood samples. Of course, I was also able to spend some quality time with the cute non-aquatic fluffies!

Taking a gill biopsy from a shark



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Another challenging case I was lucky to take part in was a penile prolapse of a saltwater crocodile at the local wildlife park. Upon examination, the prepuce was prolapsed and was not reducible. We were able to successfully excise the prepuce and the penis was able to be reduced. It was an amazing feeling knowing that I was suturing a crocodile and hopefully one day I will be able to work with these amazing creatures again.

Overall, I am so ecstatic that I was able to take part in this internship. It was an awesome experience and being the first international veterinary student to take part in the program, I would definitely recommend it to anyone who is interested!



Meeting the Marmosets

Medicating the stingray

Hui Nee Chin
Murdoch
University
WAVMA
Student
Chapter
Founder &
President



Elizabeth (Betsy) Bamberger, DVM -
Associate Fish Pathologist,
California Department of Fish and Wildlife,
Fish Health Laboratory

As my plane touched down in Portland, Oregon, I knew I was destined for a treat: gorgeous views of a famous harbor, local hip foodie restaurants galore, and best of all: the meeting place for the 7th annual International Symposium on Aquatic Animal Health (ISAAH)! This year, thanks to WAVMA/AVMA/AVMF's generous Aquatic Veterinary Educational Grants program, I was able to take a brief hiatus as a California Fish and Wildlife fish pathologist to mingle with the big names in fisheries management, research, and aquatic veterinary medicine.

Over the next four days, I was like a kid in the candy store as I jumped from lecture to lecture on the most diverse aquatic health topics: common zebrafish histopathology misinterpretations, the collection and transport of ornamental fish within the exotic pet industry, prespawning mortalities in Chinook salmon, and many more fascinating topics for any fish enthusiast.

While nearly every lecture provided new insights into cutting edge developments, I found the special sessions on the diseases of wild fishes and the interactions between wild and cultured fishes to be the most relevant to my work in Sacramento, California. I hope to take back to my lab some new ideas and techniques to help us better understand, diagnose, and treat the kinds of parasites and pathogens we frequently encounter.

In the end, I felt like I had finally found the aquatic medicine community I had been searching for. Never in my life have I been surrounded by more fish experts from state hatchery agencies, private practices, universities, and research facilities. I greatly appreciate that this type of conference has been organized by a group of wonderful people who are determined to maintain strong lines of communication among aquatic specialists. If I'm so lucky in the future, I plan on going back to ISAAH to catch up with the contacts I made while attending this event.

Thank you WAVMA and all the associated organizations that made this trip possible for me! I value your support in helping me continue my own education and providing opportunities for young professionals such as myself.

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COLLEAGUE'S CONNECTION

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A DAY WITH DR. ABE ROBINSON, CLINICAL VETERINARIAN AND RESEARCH FELLOW AT MOTE MARINE LABORATORY AND AQUARIUM.

BY: SARASOTA MAGAZINE



As [Mote](#)'s clinical veterinarian, 35-year-old Dr. Abe Robinson takes care of every creature in the aquarium and research programs. The Texas native, who has doctorates in veterinary medicine and toxicology and was a Mote intern during medical school, joined the staff about a year ago and says this is his dream job. "No day is ever the same," says Robinson, whether it involves figuring out what's wrong with a sluggish shark, checking on a manatee (this page) or building an operating table with life support system outside the 130,000-gallon fish tank so he could remove a 90-pound grouper's damaged left eye.

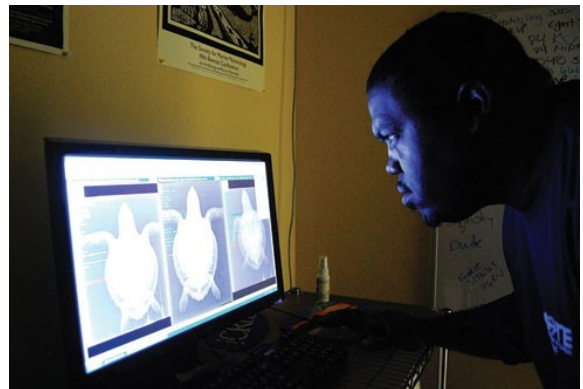
7:22 a.m. "I start my day walking our dogs, Lyvia and Angelii. I've loved animals and wanted to be a vet since I was little. But after doing an alternative zoological lab track in vet school, I realized I wanted to work with more species than just dogs and cats."



8:37 a.m. "I work with all the departments on an almost daily basis to see if any health issues are going on. Here Mike Collins, our exhibits manager, and I are discussing plans that will be affecting animals in new exhibits."



9:03 a.m. "At least once a week I walk around the entire aquarium to make sure everything is OK. The moment you stop looking, that's when something happens. I'm watching how this shark is swimming—making sure he's not behaving in a way that would indicate a medical issue."



10:20 a.m. "The X-rays show this turtle has ingested a fishing hook. It happens pretty frequently. Sometimes we'll sedate the turtle and remove it. If it's farther down the GI tract and affecting an organ, we may perform surgery. And sometimes it just passes through the digestive tract."

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11:34 a.m. "I'm performing an examination on one of the recently hatched diamondback terrapins that will be on display in a new exhibit starting around February. He passed with flying colors!"



1:21 p.m. "We desensitize the marine mammals by frequently handling them so they'll allow us to do health procedures when needed. This is Moonshine—he was stranded in the keys as a calf in 2003. He's a very cool animal with a lot of personality, the only pan-tropical spotted dolphin in captivity in the U.S."



4:08 p.m. "I'm researching alternative sources of nutrition for the fish we raise in aquaculture. The world will need 70-100 percent more nutrition by 2050, and aquaculture will be key. I write my ideas, possible solutions I want to test—everything goes on that board. It's a playbook for my research."



5:17 p.m. "On my way home from work. I did auto-cross and amateur racing in graduate school and when I have time I like to go to auto racing events. This is a 50th Anniversary Corvette Z06—I bought it in grad school."



9:45 p.m. "My wife, Karla (at right), still lives in Texas, where she's a high school counselor. She hasn't found the right job here yet. She flew in for the [Oceanic Evening](#) at the Ritz; we're talking to board trustee Penelope Kingman. I love meeting people and hearing how excited they are about Mote."

See more at: <http://sarasotamagazine.com/blog/2014/12/03/day-life-mote-veterinarian-dr-abe-robinson/#sthash.qnN3A3uF.dpuf>

Original article from: <http://sarasotamagazine.com/blog/2014/12/03/day-life-mote-veterinarian-dr-abe-robinson/>

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GRAND ROUNDS CASES

Fourth Quarter 2014

Questions & Answers from the WAVMA Listserv (WAVMA_Members-L@wavma.org)

Skin Infection in a Tinfoil Barb

Colleagues,

I have a client who has three 8+ year old tinfoil barbs (*Barbonymus schwanenfeldii*) that have been battling the pronounced fin rot you see in the attached pictures. The problem started approximately a year ago.

The fish are in a 75 gallon tank, which is HIGHLY filtered and the water quality is excellent. He has treated with Melafix, Maracyn, Maracyn 2, and Sulfas. This appears to be fungal to me (other suggestions welcome). What treatment recommendations would you suggest?

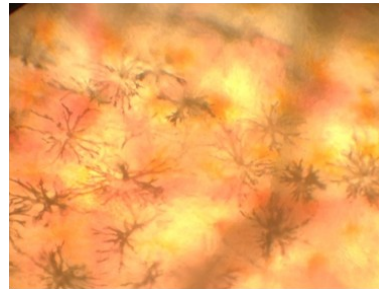
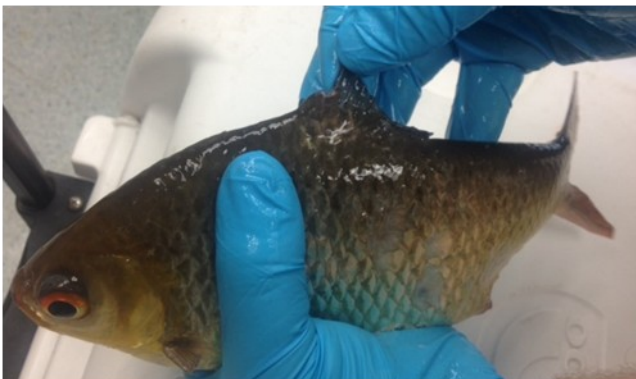
Thank you so much for your time!

Chad Harris, DVM

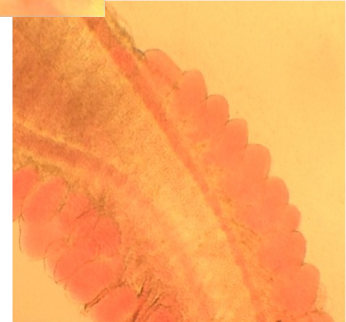
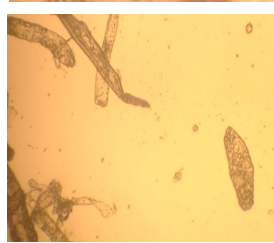
North Austin Animal Hospital
Austin, Tx
512-459-7676
caharris24@yahoo.com



White lesions on the sides and on dorsal fin.



Photomicrographs of skin biopsy (left) and gill biopsies of the Tinfoil Barb.



Hi Chad

The chronicity of presentation and the application of a cocktail of drugs will make definitive diagnosis a challenge. The picture of the skin scrape biopsy shows heaps of melanophores and chromatophores. In the photo of the gill biopsies, there are aneurysms (telangiectasis) that may be due to increased fragility of secondary lamellae, or a sampling artefact (if fish struggle during the procedure or rough sampling).

The elongate 'blob' is shaped like a skin fluke, however there is no evidence of haptors. Did you see anything motile in wet preparation samples? Any evidence of conidia for a fungus? Fungi can be visualised better by digesting fresh sample in KOH. You could also try to stain them with lactophenol blue, but this technique is better from cultures rather than direct preparations. You could try culturing for fungi.

I wouldn't rule out a primary bacterial infection even with negative bacterial culture results due to the cocktail of antibiotics used (erythromycin, minocycline and sulphas). Did you see anything on air dried smears of lesions stained with Diff Quik or Gram?

Dr Richmond Loh

DipProjMgt, BSc, BVMS, MPhil (Pathology) Murdoch, MANZCVS (Aquatics & Pathobiology).

The Fish Vet, Perth, Western Australia.

<http://www.thefishvet.com.au>

thefishvet@gmail.com

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GRAND ROUNDS CASES

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Questions & Answers from the WAVMA Listserv ([WAVMA Members-L@wavma.org](mailto:WAVMA_Members-L@wavma.org))

Goiter in Public Aquarium Fish

An interesting question was raised at a seminar for which none knew the answer. Wonder if you might be able to help.

In a public aquarium, the Rock Sea Bass (*Centropristis philadelphica*) seem to have a predilection for goiter; so severe that they eventually aren't able to eat.

They are kept in a recirculating system and only occasionally replace the water with natural seawater. Nitrate levels vary from 30-70 mg/L. Ozone is used. The questions were: is it iodine deficiency that is causing the goiter? If yes, does high nitrate or ozone play a role in depleting iodine?

How should it be investigated and rectified?

Yours sincerely,

Dr Richmond Loh

DipProjMgt, BSc, BVMS, MPhil (Pathology), MANZCVS (Aquatics & Pathobiology), CertAqV, CMAVA, NATA Signatory.

Aquatic Veterinarian | Adjunct Lecturer [Murdoch University](#) | President [WAVMA](#) |

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Hi Richmond,

Both ozone and high nitrate can affect iodine levels. Ozone will break iodine down in the water and high nitrates (greater than 70 mg/L) are considered goiterogenic and will inhibit iodine uptake by the thyroid and prevent conversion into T3 and T4.

As fish will absorb 70% of their iodine needs from the water and only 30% from food, it is ideal to supplement the water with iodine, such as Lugol's iodine. It's also a good idea to supplement in the diet as well.

You may have to reconsider ozone on that system since that species seems to be prone to goiter.

I don't have any teleost papers on goiter, but the following research article abstract explains the phenomenon in elasmobranchs:

Journal of Zoo and Wildlife Medicine
43(3): 621–624, 2012

Copyright 2012 by American Association of Zoo Veterinarians

THE ONSET OF GOITER IN SEVERAL SPECIES OF SHARKS FOLLOWING THE ADDITION OF OZONE TO A TOUCH POOL

Alexis L. Morris, M.Sc., Donald W. Stremme, V.M.D., Barbara J. Sheppard, D.V.M, Ph.D., Dipl. A.C.P.V., Michael T. Walsh, D.V.M, Lisa L. Farina, D.V.M., Dipl. A.C.V.P, and Ruth Francis-Floyd, D.V.M., M.Sc., Dipl. A.C.Z.M.

Abstract: This report describes the onset of goiter in several species of shark following the addition of ozone to a touch pool. Five brown-banded bamboo sharks (*Chiloscyllium punctatum*) and 11 white-spotted bamboo sharks (*Chiloscyllium plagiolum*) housed in the same system developed clinical disease consistent with goiter, but two zebra bullhead sharks (*Heterodontus zebra*) did not. Plasma thyroxine (T4) concentration was 4.64 ng/ml before euthanasia, consistent with a diagnosis of hypothyroidism.

The sharks had been chronically exposed to mean NO₃-N concentrations of 35 (+/- 5.12 standard error) mg/L before ozonation of the system. Ozonation of aquarium water causes a reduction in environmental iodide, which is required for thyroid hormone synthesis. Nitrate is goitrogenic and would further decrease iodine absorption by competitive inhibition. Multinodular goiter is consistent with goiter caused by chronic iodide deficiency. Understanding the interaction between water chemistry and goiter development is critical to development of elasmobranch health management systems.

Hope this helps.

Mike Hyatt

Adventure Aquarium
Camden, NJ

mwhyatt@gmail.com



Rock Sea Bass
image from:

<http://myfwc.com/wildlifehabitats/profiles/saltwater/sea-bass/rock-sea-bass/>

AQUATIC VETERINARY ABSTRACTS

Aquatic Turtles

Effects of Bait Type, Bait Age, and Trap Hours on Capture Success of Freshwater Turtles

Southeastern Naturalist 13(3):619-625. 2014
Ivana Mali^{1,*}, David Haynes² and Michael R.J. Forstner¹

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* Corresponding author im1040@txstate.edu.

Manuscript Editor: John Placyk

Abstract

We trapped freshwater turtles using hoop nets and 3 different bait types along a short section of Oyster Creek, Fort Bend County, TX. Using a model-selection approach, we tested the effectiveness of different baits on capture success, taking into consideration the length of time the bait was in the water, time of day, and the number of hours for the set (trap hours). We had significantly more success when we used dry dog food and dry cat food than traditional canned sardine bait. Bait age and time of day when traps were checked had no influence on capture success. Contrary to our expectations, the number of captures decreased throughout the study.

Our results suggest that turtle researchers should consider using alternative bait types to maximize trap effort. However, there was a significant interaction between canned sardines and bait age for *Trachemys scripta elegans* (Red-eared Slider) captures, suggesting that canned sardines should be replaced often. In addition, more research is needed to test capture success when baits are older than one day.

The Influence of Maternal Size on the Eggs and Hatchlings of Loggerhead Sea Turtles

Southeastern Naturalist 13(3):587-599. 2014
Anne Marie LeBlanc^{1,*}, David C. Rostal¹, K. Kristina Drake¹, Kristina L. Williams², Michael G. Frick³, John Robinette⁴ and Debra E. Barnard-Keinath⁴

¹Department of Biology, Georgia Southern University, PO Box 8042, Statesboro, GA 30460.

² Caretta Research Project, PO Box 9841, Savannah, GA 31412.

³ Archie Carr Center for Sea Turtle Research, Department of Biology, University of Florida, Gainesville, FL 32611.

⁴ US Fish and Wildlife Service, Savannah Coastal Office-Wassaw and Tybee National Wildlife Refuges, 1000 Business Center Drive, Suite 10, Savannah, GA 31405.

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annemarielbeich@gmail.com.

Manuscript Editor: Ray Carthy and Glen Mittelhauser

Abstract

Our study examined variation in and correlation of reproductive traits for a population of *Caretta caretta* (Loggerhead Sea Turtle) nesting in Georgia and compared the results with those of other studies. We assessed variability in reproductive traits (i.e., maternal length, clutch size, egg diameter, egg mass, hatchling length, and hatchling mass) on the population level and individual level. At the population level, we investigated interannual and intraseasonal variation of these traits for 810 Loggerhead Sea Turtle nests in Georgia, on Wassaw National Wildlife Refuge (NWR) and Blackbeard Island NWR during 2000–2003 and 2001–2003, respectively.

As the nesting season progressed, we observed a decrease in clutch size, mean egg diameter, mean egg mass per clutch, mean hatchling length per clutch, and mean hatchling mass per clutch. Further, we measured all previously mentioned traits on a subset of the female turtles encountered on the beach ($n = 24$) and used these data to examine the variability of the traits on the individual level. Generalized linear modeling using this more refined individual-level data set indicated that 55% of the variability in clutch size was explained by a combination of maternal length (47%) and hatchling length (8%).

This model suggested that clutch size was positively related with maternal length ($t = 4.79$) and negatively related with hatchling length ($t = -1.90$). Greater maternal length resulted in larger clutch size, but not larger egg size; thus, egg size was relatively constant irrespective of maternal length. These results support optimal egg-size theory, indicating a trade-off between clutch size and hatchling size to produce the optimum maternal investment per offspring.

A Preliminary Assessment of Habitat Partitioning in a Freshwater Turtle Community at an Isolated Preserve

Copeia 2014(2):269-278. 2014

Whitney J. B. Anthonysamy¹, Michael J. Dreslik¹, David Mauger², and Christopher A. Phillips¹

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²17029 Henry Street, Lansing, Illinois 60438.

Associate Editor: J. D. Litzgus.

Abstract

Understanding species-habitat relationships is important for achieving effective habitat management goals, but few studies have evaluated habitat use in co-occurring turtle species. We examined habitat partitioning among five species of freshwater turtles at an isolated preserve in northeastern Illinois. From May-September 2006, we conducted a radio-telemetry study to determine differences in macro- and microhabitat use, niche breadth, and niche overlap of 50 turtles representing rare (*Emydoidea blandingii*, *Clemmys guttata*) and common species (*Chrysemys picta*, *Chelydra serpentina*, *Sternotherus odoratus*).

Both levels of habitat analysis showed strong partitioning between *C. guttata* and the common species as well as marked overlap in habitat use between *E. blandingii* and *C. serpentina*. Use of mesic dolomite prairie was greater in *C. guttata* compared to *S. odoratus*. Further, use of pond was greater in all common species compared to *C. guttata* and *E. blandingii*.

Species strongly partitioned microhabitat along an axis comprised of vegetation height, understory canopy cover, water depth, and percent open water at surface, as well as in use of wetlands with organic substrates. Patterns of macro- and microhabitat use and measures of niche breadth and niche overlap suggest that *E. blandingii* and *C. serpentina* are habitat generalists whereas *C. guttata* is a habitat specialist.

We found no evidence of agonistic interactions among species, thus habitat partitioning observed in our study is likely a result of species-specific traits and requirements. Our findings suggest that *C. guttata* is most vulnerable to habitat degradation and that variation in wetland habitat characteristics is necessary to support a diverse freshwater turtle community.

Dispersal Behavior of Diamond-Backed Terrapin Post-Hatchlings

Southeastern Naturalist 13(3):572-586. 2014

Andrew T. Coleman^{1,4,*}, Thane Wibbels¹, Ken Marion¹, Taylor Roberge¹, David Nelson², and John Dindo³

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² Department of Biology, University of South Alabama, Mobile, AL 36688.

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⁴ Current address - Institute for Marine Mammal Studies, Gulfport, MS 39503.

* Corresponding author - acoleman@imms.org.

Abstract

Post-emergence dispersal behavior of hatchling turtles has been investigated in several species, and a variety of species-specific orientation patterns have been reported. In the current study, we examined the orientation and dispersal behavior of hatchling, post-hatchling, and yearling *Malaclemys terrapin pileata* (Mississippi Diamond-backed Terrapin) by utilizing an orientation arena on two natural nesting beaches.

Each age group displayed strong orientation and dispersal towards high-marsh vegetation instead of open water. The results suggest an innate behavior in young Diamond-backed Terrapins in which they orient from open beach areas toward vegetated marsh areas. The results also stress the importance of having healthy marsh habitat adjacent to nesting areas to provide critical habitat for these vulnerable life-history stages of Diamond-backed Terrapins.

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THE AQUATIC VETERINARIAN

Volume 8, Number 4

LITERATURE REVIEW

Fourth Quarter 2014

Pollution linked to lethal sea turtle tumors

September 30, 2014 - Duke University

Polluted urban and farm runoff in Hawaii has been linked to lethal tumors in endangered sea turtles. A new study finds that excess nitrogen in the runoff accumulates in algae that the turtles eat and can cause the disease Fibropapillomatosis, which is the leading known cause of death in endangered green sea turtles. The study, published in the peer-reviewed open-access journal PeerJ, shows that nitrogen in the runoff ends up in algae that the turtles eat, promoting the formation of tumors on the animals' eyes, flippers and internal organs.

Scientists at Duke University, the University of Hawaii and the National Oceanic and Atmospheric Administration (NOAA) conducted the study to better understand the causes behind the tumor-forming disease Fibropapillomatosis, which is the leading known cause of death in green turtles, said Kyle Van Houtan, adjunct associate professor at Duke's Nicholas School of the Environment.

"We're drawing direct lines from human nutrient inputs to the reef ecosystem, and how it affects wildlife," said Van Houtan, who is also a scientist in NOAA's Turtle Research Program.

This research builds on a study published in 2010 that found the disease was more prevalent in areas with high levels of nitrogen runoff. That study hypothesized the disease might be linked to how algae that the turtles eat store extra nitrogen, and designed this study to test that idea.

"In this paper we drill down on whether excess nitrogen inputs are causing a nutrient cascade in the system that's ending up in these tumors in green turtles," said Van Houtan.

One way that algae store excess nitrogen is in an amino acid called arginine. The researchers found unusually high levels of arginine both in the algae in highly polluted waters and in the tumors of diseased turtles. Arginine levels in algae in less polluted waters and tumor-free tissues were comparatively low.

One non-native red algae species, *Hypnea musciformis*, had especially high levels of arginine compared to other species sampled. *Hypnea* is invasive and thrives in the nitrogen-rich waters caused by nutrient pollution. Since it grows more successfully than native species of algae, it can make up as much as 90 percent of the turtles' diet.

Because this algae contains so much arginine and the turtles eat so much of it, the turtles have approximately 14 times more arginine in their systems than they would if they were eating native algae species in less-polluted waters.

Even worse, the turtles, which are herbivorous, have to eat twice as much of the invasive algae species to get the same amount of calories they would gain from eating native algae.

"The energy and arginine content of (the algae) may therefore act as a sort of one-two punch for promoting this disease," the study noted.

Arginine is thought to promote a virus that leads to the disease that forms the tumors. "If this disease is a car, arginine its fuel," said Van Houtan. Without it, the virus can't function. How the virus causes tumors is still unclear. Arginine is just one of the molecules the researchers measured in the turtle tumors. They also found elevated levels of amino acids that are common in human cancer tumors, such as proline and glycine.

Measuring amino acids in the turtle tumors allowed the researchers to better understand how the tumors form and function. Similar analyses of amino acids may also be useful in understanding human cancer tumors, said Van Houtan. "A hallmark of cancer tumors is that they re-program their host cells and change their metabolism. Our findings here are similar."

This research could help scientists better understand how to protect not only sea turtles but also other marine plants and animals that face similar threats from pollution. "It's not just green turtles, but fish and coral reefs that have similar diseases in these locations," said Van Houtan.

Van Houtan said he hopes future research on this problem can inform environmental management of reef systems as a whole. "If research continues to support this hypothesis, we probably need to reconsider our current ways of managing coastal nutrients," he said.

Story Source:

The above story is based on [materials](#) provided by [Duke University](#). The original article was written by Kati Moore, Nicholas School Communications Student Assistant.

Journal Reference:

Kyle S. Van Houtan, Celia M. Smith, Meghan L. Dailer, Migiwa Kawachi. Eutrophication and the dietary promotion of sea turtle tumors. PeerJ, 2014; 2: e602 DOI: [10.7717/peerj.602](https://doi.org/10.7717/peerj.602)

Digestion of Jellyfish helps Leatherback Sea turtles stay warm

[FRANCES WILLICK](#) Staff Reporter

The Herald, Nova Scotia—7/3/14

Research conducted off the northern coast of Cape Breton has shed light on how leatherback turtles stay warm in the chilly waters of the Atlantic Ocean. Previously, scientists speculated that turtles had to stay active in order to generate enough body heat with their muscles. But a new study published in the *Journal of Experimental Biology* shows that digesting jellyfish accounts for about half the heat required for the massive turtles to thrive in the frigid environment.

"If you think about how you feel after your Thanksgiving dinner — 'I'm going to take a sweater off now, I feel warm' — there is heat that's generated due to the process of digestion," said Amanda Southwood Williard, one of the study's authors and an associate professor in the department of biology and marine biology at the University of North Carolina Wilmington.

The researchers, including lead author James Casey of Barnard University in New York and Mike James of Fisheries and Oceans Canada, as well as field partner Kathleen Martin of the Canadian Sea Turtle Network, tracked the body temperatures of seven leatherbacks in 2009. The turtles were fed a tiny pill containing a temperature monitor. As the pill moved through the digestive system, it sent data to an instrument on the turtle's back for transmission to a satellite.

The data showed that body temperature tended to drop during the daytime while the turtles were ingesting cold jellyfish and then increased at night during digestion. On average, the turtles' body temperature was 26.4 C, or about 10 degrees higher than the surrounding water. Leatherback turtles, whose curved upper shells alone measure about 1.5 metres ("That doesn't include their big head," Williard notes), weigh hundreds of kilograms and can eat an average of 73 per cent of their body mass in jellyfish per day. Their depth in the water also affects their body temperature, as surface water tends to be warmer than deeper levels.

Leatherback turtles are an endangered species. In other parts of the world, their eggs, which are laid on beaches, are harvested as food. Development in nesting areas also threatens the population. In Nova Scotia, the main threat is fishing gear, which can drown a turtle if it's unable to extricate itself from nets.

Alfaxalone as an induction agent for anaesthesia in terrapins and tortoises

Veterinary Record doi:10.1136/vr.102486

[Z. Knotek](#), DVM, PhD, Dip, ECZM

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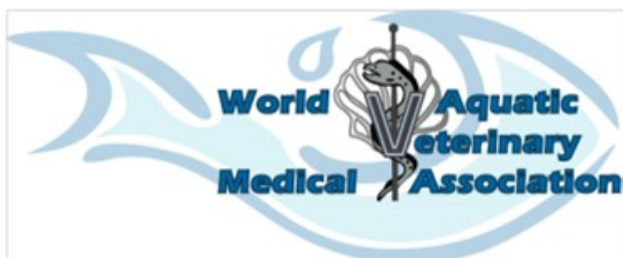
Abstract

The aim of this study was to evaluate short-term intravenous anaesthesia with alfaxalone in chelonians. In the first part of the study, alfaxalone at a dose rate of 5 mg/kg was administered intravenously to 10 adult female red-eared terrapins (*Trachemys scripta elegans*) following 24 hours of fasting. The induction time, tracheal tube insertion time, surgical plane of anaesthesia interval, and full recovery time were recorded.

The head, neck and leg withdrawal reflex was lost within 21.09±8.07 seconds. The mean tracheal tube insertion time, the time of surgical plane of anaesthesia and full recovery time were 27.50±12.96 seconds, 26.40±4.72 minutes and 33.70±4.76 minutes, respectively.

In the second part of the study, 50 chelonians (20 red-eared terrapins, 10 Hermann's tortoises, eight spur-thighed tortoises, six marginated tortoises and six Russian tortoises) were treated intravenously with 5 mg/kg alfaxalone after administration of 1 mg/kg meloxicam and 2 mg/kg butorphanol intramuscularly.

The head, neck and leg withdrawal reflex was lost within 21.52±6.57 seconds, the endotracheal tube could be inserted within 25.76±8.24 seconds, and the time to deep pain sensation loss was 29.46±9.67 seconds. Intravenous use of alfaxalone proved to be a suitable method of induction for inhalation anaesthesia in terrapins and tortoises.



THE AQUATIC VETERINARIAN

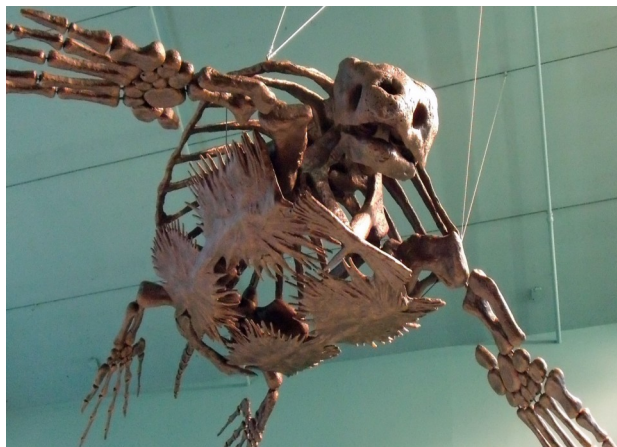
Volume 8, Number 4

LITERATURE REVIEW

Fourth Quarter 2014

The bones of sea turtles have annual rings like those found in trees, and chemical markers within them give scientists a detailed view of the animal's life history.

By **Rich Press**, NOAA Fisheries Science Writer
Posted: October 30, 2014



This is a skeletal replica of Archelon ischyros, a species of turtle that lived 75 million years ago and reached 4 meters in length. Photo credit: Mike Beaugard/Creative Commons.

Where have you been all these years? That's a question scientists have been asking sea turtles for a long time. After the turtles hatch and waddle into the sea, they're pretty much off the radar until they turn up as juveniles on beaches that might be half a world away. But thanks to new technology, scientists are finally getting some answers.

One of those new technologies involves skeletochronology. "Just like trees have annual rings, so do the bones of sea turtles," said Cali Turner Tomaszewicz, a scientist at NOAA's Southwest Fisheries Science Center in La Jolla, California. "And you can analyze those rings to get all kinds of information about the animal's life history."

The rings are most visible in the humerus bones. Turner Tomaszewicz collects the bones from the bodies of sea turtles that are found dead on beaches in Northern Mexico and California. She works mainly with Eastern Pacific green turtles and North Pacific loggerheads, both of which are listed as endangered under the Endangered Species Act.

"The animal does have to be dead for us to get at this data," Turner Tomaszewicz said. "Even though their death is unfortunate, we can still learn something from them afterwards."



NOAA Fisheries scientist Cali Turner Tomaszewicz with a humerus bone from a deceased green sea turtle in Baja California, Mexico. Turner will analyze the chemical signatures in the annual rings of the bone to learn the life history of the animal. Photo courtesy of Cali Turner Tomaszewicz.

After collecting a humerus bone, Turner Tomaszewicz brings it to the lab and, using a high-precision, diamond-studded circular saw, cuts two adjacent cross sections, each exactly 3 millimeters thick. "They look like wooden nickels," Turner Tomaszewicz said.

She also cuts a 25-micron-wide slice at the same location and stains it with dye that makes the annual rings visible. Using the stained slice as a blueprint, she then programs a computer-driven micro-drill to extract tiny tissue samples from the thicker slices, with each sample coming from a different annual ring.

Turner Tomaszewicz analyzes the tissue in each ring using a technique called stable isotope analysis. That technique is based on the fact that chemical elements, including nitrogen, carbon, and oxygen, come in two varieties: heavy and light. Conveniently for scientists, the near-shore environment is richer in heavy nitrogen than the open ocean, and that difference shows up in the tissues of the animals that live there.

"By analyzing the annual rings, we can see during what years a turtle was in its oceanic phase and at what age it settled into its near-shore habitats." And this analysis has yielded some surprising results. It turns out that loggerheads spend up to two decades—much longer than previously thought—off the North American coast before returning to their nesting beaches in Japan.

For full story, see:

http://www.nmfs.noaa.gov/stories/2014/10/10_30_14sea_turtle_skeletons.html

THE AQUATIC VETERINARIAN

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LITERATURE REVIEW

Fourth Quarter 2014

Know Your Oysters

The Eastern oyster (*Crassostrea virginica*), family Ostreidae, native to the East Coast of North America is in the genus classified as a “cupped oyster” as opposed to a “flat oyster” found in the *Ostrea* genus. The oyster native to the West Coast is the highly valued, but now rare, (flat) Olympia oyster (*Ostrea lurida**). The Pacific oyster (*Crassostrea gigas*) is not really native to North America, but was introduced from Japan and now typically accounts for about 34% of total US production and 99% of West Coast production. The Eastern oyster accounts for about 65% of total US production. Canadian production of the oysters (mostly the Eastern oyster from the Gulf of St. Lawrence) typically accounts for about 30% of total US and Canadian production.

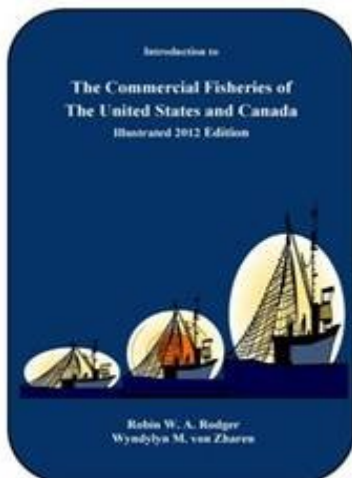
Other introduced oyster species include the Japanese “Kumamoto” oyster (*C. gigas kumamoto*), a subspecies of *C. gigas*; and the edible oyster, also known as the European flat or “Belon” oyster (*Ostrea edulis*); however, production of these two species is relatively diminutive.

[*Note: the *O. conchaphila* (valid and verified in *ITIS*) is also denoted as “Olympia oyster” in *The Seafood List*. Hence, apparently two species can be considered as an “Olympia oyster.”]

For additional information on North American fish and shellfish species see:

http://www.CMPpublications.com/na_fisheries

Excerpt from **An Introduction to the Commercial Fisheries of the United States and Canada**, by R. Rodger and W. von Zharen. 2012



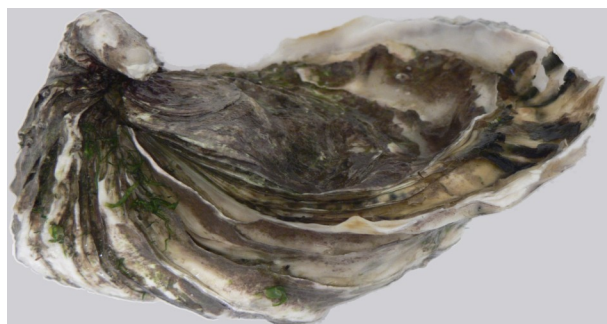
Be the life of any seafood party be properly identifying the species of oyster being consumed:



Eastern Oyster (*Crassostrea virginica*)
http://www.chesapeakebay.net/fieldguide/critter/eastern_oyster
(Fisheries and Oceans Canada/World Register of Marine Species)



Olympia Oyster (*Ostrea lurida*)
http://en.wikipedia.org/wiki/Ostrea_lurida
Photo by Maggie Freeman



Pacific oyster (*Crassostrea gigas*)
http://en.wikipedia.org/wiki/Pacific_oyster

THE AQUATIC VETERINARIAN

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NEWS AND VIEWS

Fourth Quarter 2014

Global Ranavirus Consortium

The scientific community is increasingly aware that emerging infectious diseases pose a significant threat to global biodiversity. A group of viruses in the genus *Ranavirus* (Family Iridoviridae) cause disease in amphibians, reptiles and fish, and appear to be emerging in some populations. Ranavirus-associated die-offs in larval and adult amphibians have been documented in the Americas, Europe, and Asia, with death rates often exceeding 90% during an outbreak. Ranavirus infections also have been reported in wild and cultured fish populations worldwide.

While research on reptiles has been slower to accumulate, recent evidence suggests that ranaviruses are capable of causing morbidity and mortality in free-ranging populations. The capability of ranaviruses causing disease in poikilothermic animals belonging to three vertebrate classes emphasizes the potential risk of these pathogens to global biodiversity.

The Global Ranavirus Consortium (GRC) was formed following the [First International Symposium on Ranaviruses](#). The goal of the GRC is to facilitate communication and collaboration among scientists and veterinarians conducting research on ranaviruses and diagnosing cases of ranaviral disease. Since formation, the GRC has published 3 popular articles on the 2011 Symposium and organized the [Second International Symposium on Ranaviruses](#), which was held 27 – 29 July 2013 concurrently with the International Conference of the Wildlife Disease Association in Knoxville, Tennessee, USA. The [Third International Symposium on Ranaviruses](#) will be held 30 May - 1 June 2015 at the University of Florida in Gainesville, FL, USA. The GRC recently hosted a [workshop](#) on ranaviruses in Harbin, China.

The GRC was recently approved to write the first book on ranaviruses, which will be published as an eBook (i.e., chapters can be purchased independently) by Springer. Target publication date is November 2014. The GRC formed global regional discussion groups to help facilitate the transfer of information among scientists, and created a website with [recent publications](#). To improve understanding of the global distribution of ranaviruses, the GRC is working to secure funds to create a [Global Ranavirus Reporting System](#). The Executive Board has finalized [bylaws for the GRC](#), and will be offering membership options in 2014.



If you would like to be listed as a GRC scientist or contribute to activities, please contact Dr. Matthew Gray or your regional representative on the Executive Board (see below). We also encourage interested students and scientists to join the GRC LISTSERV (see below).

Executive Board:

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MGRAY11@UTK.EDU
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If you would like to become a member of the GRC listserv, you can join at this website:
<http://listserv.utk.edu/cgi-bin/wa?A0=GRC>.

Other Resources:

[Global Ranavirus Reporting System](#)
[Laboratories Testing for Ranavirus](#)
[2013 Ranavirus Symposium](#)
[Important Research Directions](#)
[New Publications!!](#)

Killer ranavirus threatens frogs, turtles - The disease blamed for a worldwide decline in amphibians has been spreading to reptiles.

By Molly Murray

The News Journal (Wilmington, Del.)

June 2, 2014

A virus partially blamed for a worldwide amphibian decline has made its way to Delaware, killing tadpoles and [raising fears it will spread to reptile species](#). The ranavirus, a type of virus that affects cold-blooded species, has been found in wood frog tadpoles in all of Delaware's counties and eight in Maryland. And there is concern it could impact reptile species like the Eastern box turtle or endangered species like the bog turtle.

"Of 23 Delaware ponds tested in 2013, ranavirus was detected in 14 (61 %) and amphibian die-offs were recorded for two of those during the sampling period," said Holly Niederriter, wildlife biologist with the state's Species Conservation and Research Program. In addition, a dead bog turtle found three years ago in Delaware likely died from a predator attack but it was infected with ranavirus, herpes and mycoplasma, she said.

Tracking the potential impact on relatively secretive turtle species is difficult. Niederriter said that infectious diseases such as ranavirus – which is likely spread by contact with water or sick or dead tadpoles – are a large cause of the worldwide amphibian decline. The disease is found throughout the United States in both frogs and turtles but it has not been found in birds or mammals. With some tadpole frog species, the mortality rate is as high as 99 percent.

The ranavirus was identified in Maryland in 2001 in Prince George's County, said Scott Smith, a wildlife ecologist with the Maryland Department of Natural Resources. Delaware officials began looking for the disease in wooded ponds last year as part of a regional effort, prompted by a turtle die-off discovered as part of a study on the impact of a proposed new highway in the Maryland suburbs of Washington.

A researcher at Towson University put radio transmitters on Eastern box turtles to see how they would fair if they were moved to new locations as part of a road construction mitigation project. But the transmitters turned up something unexpected.

"They'd be sick one day and dead the next," Niederriter said.

Smith said the researcher lost both his control site and his two test plots to ranavirus in the study that took place from 2008 to 2011. One reason for the concern, Smith said, is that box turtles are long-lived and have reproductive strategy that differs from frogs. Frogs typically lay eggs in woodland ponds by the hundreds. But box turtles, while laying several clutches of eggs, may only lay three to eight at a time.

Smith said with frogs, especially wood frogs, the disease seems to have highest impact on the tadpoles but doesn't kill adults. That means the adults, which typically live five to eight years, can return to breed again the following year. There are species, like bullfrogs, that appear more resistant to the disease, he said.

So far, researchers believe the disease in our area has the greatest impact on wood frogs and spotted salamanders. No one is certain how it spreads from pond to pond, though there is some thought that other wildlife may spread it, including bullfrogs, which can travel three miles to breeding pools. Researchers have found that one day a pond can seem fine and then the entire wood frog tadpole population can be wiped out in as little as five days.

Over several days in late May, Niederriter and research assistant Christine Tilton set out to sample wood frog tadpoles. The two scientists waded into slightly less than knee deep water at Blackbird State Forest. In March, they marked the areas where wood frogs laid their egg masses with orange survey tape. Last week, they took long-handled nets and swept through the leaves and water in the survey area, searching for inch-and-a-half long tadpoles. They needed 30 animals, which they collected in a bucket and took back to a test site in a cleared area in the woods.

"They have to be a certain age," Niederriter explained. The telltale sign is that the tadpoles are starting to develop legs. At this stage of development, the tadpoles may even show signs of the disease – red splotches.

For this study, the tadpoles are killed with a numbing agent before being examined because they must be sent out to a lab for positive confirmation of the disease.

"This year we're finding die-offs in more of the ponds," Niederriter said.

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Flu at the zoo and other disasters: Experts help animal exhibitors prepare for the worst Oct 23, 2014



After experiencing power outages during a 2007 ice storm in Springfield, Mo., Dickerson Park Zoo officials improved their backup power and heating systems to keep animals -- like Henry, pictured here -- safe and warm.

Photo Credit: Dickerson Park Zoo

Here are three disaster scenarios for zoo or aquarium managers: One, a wildfire lunges towards your facility, threatening your staff and hundreds of zoo animals. Two, hurricane floodwaters pour into your basement, where thousands of exotic fish and marine mammals live in giant tanks. Three, local poultry farmers report avian influenza (bird flu) in their chickens, a primary source of protein for your big cats. What do you do?

These are among the many potential disasters the managers of zoos and aquariums ponder in their emergency preparedness drills and plans. But these stories are not just worst-case scenarios: The events described above actually happened, and the aftermath – often heroic and sometimes tragic – depended in large part on the institutions' preparedness training, planning and forethought in calmer times.

When bad weather strikes or illness invades, zoos and aquariums are among the most vulnerable facilities affected, said University of Illinois veterinarian Yvette Johnson-Walker, a clinical epidemiologist who contributes to emergency

response training efforts at animal exhibitor institutions. She is a clinical instructor in the department of veterinary clinical medicine at Illinois, and lead author of a new paper on emergency preparedness at zoos and aquariums in the journal *Homeland Security & Emergency Management*.

Some animals are likely to suffer if the electricity goes out for long, she said. Others are large, skittish and dangerous under normal conditions. Training caretakers and keepers to minimize their own risks while attending to their animals in an emergency is a challenge, but leads to the best outcomes, she said.

In 2012, Johnson-Walker joined forces with Yvonne Nadler, a project manager with the Zoo and Aquarium All Hazards Preparedness Response and Recovery Center, to bring vital emergency training to accredited animal exhibitor institutions in Illinois, Indiana and Missouri. This effort, funded by the U.S. Department of Agriculture and supported by the Association of Zoos & Aquariums, has since expanded, providing training to staff from zoos and aquariums in 23 states.

The trainings, dubbed "Flu at the Zoo," focus on avian influenza, a viral disease that spread in the 2000s among wild and captive birds and also infected hundreds of people, primarily in Asia, Africa and the Middle East. Bird flu serves as a useful model scenario to help train participants in basic preparedness skills.

"We wanted zoos and aquariums to have a seat at the table when there's planning for how we're going to respond to emergencies, and to be able to fit into the system, know who to talk to and how to communicate," Johnson-Walker said.

The preparedness plans, drills, discussions and training all help zoos and aquariums reassess their procedures, even those that seem to be safe after decades of operations and no major incidents, she said.

The full paper, "Flu at the Zoo: Emergency Management Training for the Nation's Zoos and Aquariums" is available online:

www.degruyter.com/view/j/jhsem.../jhsem-2013-0052.xml

Excerpted from:

<http://phys.org/news/2014-10-flu-zoo-disasters-experts-animal.html>

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The Rockfish with the Fake Eye by Vancouver Aquarium

There's a copper rockfish (*Sebastes caurinus*) in the Vancouver Aquarium Marine Science Centre's Strait of Georgia exhibit that doesn't quite look like the others. Take a close look and you might notice something a bit different about one of its eyes.

Like other long-lived animals, rockfishes often have some health issues as they age. This particular rockfish developed cataracts and needed its eye removed.

The Aquarium's head veterinarian, Dr. Martin Haulena, replaced the real damaged eye with a taxidermy eye, partly for cosmetic reasons and partly for the fish's wellbeing. Without an eye, the other fishes would act aggressively towards it for appearing sick and weak.



Dr. Martin Haulena, with the help of Lesanna Lahner, staff veterinarian of Seattle Aquarium, sewed a lovely bright yellow prosthetic eye into its eyeless hole.

"The reason we do this is because we do find that when fish are blind from one eye, and there's no visible eye, other fish will recognize that and will actually attack them from that side," Haulena says. "Cosmetic, for sure, but there's definitely an animal welfare component to putting in the prosthetics."

The team also performed this very serious googly eye surgery on one of their yellowtail rockfish (*Sebastes flavidus*) too.

To see video, click links:

<https://www.youtube.com/watch?v=og70cLV04uo>

From web article:

<http://www.aquablog.ca/2014/12/the-rockfish-with-the-fake-eye/>

Massive starfish die-off in Pacific Ocean linked to Densovirus

By Paul Rogers

progers@mercurynews.com



A diseased
sea star
(Courtesy
Nate Fletcher)

The sea-star epidemic, which threatens to reshape the coastal food web and change the makeup of tide pools for years to come, appears to be driven by a previously unidentified virus, a team of more than a dozen researchers from Cornell University, UC Santa Cruz, the Monterey Bay Aquarium and other institutions reported. In a paper published in the *Proceedings of the National Academy of Sciences*, the researchers concluded the disease is a type of densovirus. It is similar to viruses that affect insects, sea urchins and other invertebrates, and is distantly related to parvovirus, the cause of feline distemper in cats and canine parvovirus in dogs.

Scientists found that the same virus that is killing starfish today is also present in museum starfish specimens dating back to 1942, indicating the disease has been present in Pacific waters for 72 years. Although there were smaller outbreaks in years past, nobody knows what triggered the current marine plague, which has killed up to 95 percent of starfish in some areas and spread from Alaska to Mexico.

The outbreak, known as "wasting syndrome," has infected at least 20 different species of starfish since it was first detected in Washington's Olympic Peninsula in June 2013. It spread to Oregon, Monterey Bay, Big Sur and as far south as Baja California, even killing starfish in major aquariums in Seattle, Vancouver, Monterey and other cities. When infected, starfish at first become sluggish, then develop white lesions. Within days, they curl up and parts of their arms break off, sometimes literally crawling away. Not long after, the entire starfish turns into a goeey mess and dies.

[Click to view videos, interviews and more.](#)

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USDA Releases 2013 Census of Aquaculture Results

Washington, Sept. 29, 2014 –

The U.S. Department of Agriculture's National Agricultural Statistics Service (NASS) released the 2013 Census of Aquaculture results. This report is the result of the third national census conducted by NASS to measure the U.S. aquaculture industry. The last Census of Aquaculture was conducted in 2005.

"The 2013 Census of Aquaculture expands on the data collected about aquaculture during the 2012 Agriculture Census and provides a more comprehensive picture of the aquaculture sector at the national and state levels," said NASS Administrator Joseph T. Reilly. "There is always a need for current industry-specific data and the results from the census of aquaculture will be used by federal, state and local governments, agribusinesses, trade associations and producers to make decisions impacting this specialized area of agriculture."

The aquaculture census provides detailed information relating to production volume and methods, surface water acres and sources, sales, point of first sale outlets, and aquaculture distributed for restoration, conservation, enhancement, or recreational purposes.

Data highlights from the 2013 Census of Aquaculture include:

- Total sales of aquaculture products in 2013 was \$1.37 billion, an increase of 26 percent from 2005.
- Sales of food fish was \$732 million, an increase of 9 percent from 2005.
- Crustacean sales in 2013 was \$85 million, up 59 percent from 2005.
- The sales of mollusks was \$329 million, an increase of 62 percent from 2005.

"Data from the census of aquaculture allow government leaders to more accurately allocate national and local funds to support the future of the industry, such as extension service projects and agricultural research," said Reilly. "Extension and university representatives rely on the data to help determine research needs and to justify funding for programs aimed to develop new and improved methods of aquaculture production and profitability."

For the 2013 Census of Aquaculture, an aquaculture farm is defined as any place from which \$1,000 or more of aquaculture products were produced and sold or distributed for conservation, enhancement or

recreation during the census year. Aquaculture is defined as the farming of aquatic organisms, including: baitfish, crustaceans, food fish, mollusks, ornamental fish, sport or game fish and other aquaculture products. Farming involves some form of intervention in the rearing process, such as seeding, stocking, feeding or protection from predators.

Farming also implies individual or corporate ownership of the stock being cultivated, in a controlled environment at least part of the time. Fish, crustaceans, mollusks, and other aquatic products which are caught or harvested by the public from non-controlled waters or beds are considered wild caught and are not included as aquaculture.

To access the 2013 Census of Aquaculture results and other agriculture census data, visit www.agcensus.usda.gov or the Quick Stats database at <http://quickstats.nass.usda.gov>.

U.S. Federal Officials lift veil on international turtle smuggling ring

Robert Snell,

The Detroit News - September 26, 2014

Detroit — A Windsor, Canada man arrested at the Detroit-Windsor tunnel with 51 live turtles in his pants is a serial smuggler who shipped thousands of reptiles to far-flung locales hidden in snow boots and cereal boxes, a federal prosecutor said. Assistant U.S. Attorney Sara Woodward gave rare insight into a lucrative, international smuggling ring headed by Kai Xu that operated in at least three countries. She described an operation that peddled thousands of turtles, some endangered and worth \$1,800 each, and relied on aliases and reptile couriers that Xu — aka "Turtle Man" — recruited through online forums and classified ads.

Woodward lifted the veil on an unusual criminal case while successfully arguing that Xu should be denied bond while awaiting trial on charges that could send him to prison for 10 years. Xu, 26, is a liar who kept smuggling after being arrested in early August after crossing into Canada with 51 turtles taped to his legs and hidden in his crotch, Woodward said. The scope of his smuggling ring, black market riches and his Canadian residency demands that he be held in the U.S. until trial, she argued.

"He is a full-time reptile smuggler," Woodward told U.S. Magistrate Judge Donald Scheer during a detention hearing in federal court. "All of the evidence points to Mr. Xu directing others and doing it

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for a very considerable time and for an extreme amount of profit."

He was poised to go home until the prosecutor accused him of lying about enrolling as an engineering student at the University of Waterloo and continuing to smuggle turtles and tortoises despite an August arrest in Canada. There is no guarantee Xu would return to the U.S. to stand trial, Woodward argued.

The prosecutor and a federal agent chronicled Xu's years-long involvement in the turtle smuggling trade that operated online. They also described the riches involved in mailing live turtles and tortoises to Asia, where certain species are facing extinction and coveted as pets or food.

Federal agents started investigating Xu in March after a confidential informant said the Windsor man was smuggling turtles. Agents soon learned that Xu had entered the U.S. about 30 times since January to retrieve shipments of turtles from growers and mail reptiles from Detroit and Buffalo, New York, to Hong Kong, Alaska and beyond. Xu and a Canadian man, alleged reptile courier Lihua Lin, 30, were arrested after Lin tried to fly to Shanghai, China, with 970 turtles hidden in his luggage.

Xu drove his alleged courier to Detroit Metropolitan Airport with two pieces of luggage. Agents inspected the bags and found almost 1,000 turtles — including 700 diamondback terrapins and 16 kwangtung river turtles. The dark brown kwangtung turtles with stripes on its neck are worth up to \$1,800 each in the U.S. — and are three times as valuable in China.

The reptile shipment, packed in rubber snow boots and boxes of Kellogg's Corn Flakes, included wood turtles (\$500 each), Blanding's turtles (\$300), and albino red-eared sliders (\$650), the agent said. In all, the turtle shipment was worth more than \$30,000 on the black market, the agent agreed.

Agents arrested Lin at the airport before he could board a plane to Shanghai. The Toronto-area man told agents Xu paid for the plane ticket, gave him a \$500 down payment for smuggling the turtles and promised \$2,000 upon return to the U.S., according to testimony.

Photo:
*Detroit
News*



Almost 20,000 tortoises and turtles smuggled through Thailand

Wildlife Extra - 9/26/14

Nearly 20,000 tortoises and freshwater turtles have been smuggled through Thailand in six years says a new report by the wildlife monitoring agency TRAFFIC. Their report, entitled [Seizures of Tortoises and Freshwater Turtles in Thailand 2008-2013](#), analysed 53 reported seizures, more than half of which took place at Suvarnabhumi International Airport in Bangkok. But despite this staggering number they found just a third of the seizures resulted in the arrest of 40 suspects, and only six successful prosecutions were recorded.

"It is encouraging that enforcement officers in Thailand are carrying out such significant seizures, but it really is the follow-up investigations and successful prosecutions that make these seizures effective," said Dr Chris Shepherd, Regional Director for TRAFFIC in South-East Asia.

Of the 33 species seizures, the Southeast Asian box turtle was the most numerous, with approximately 7,120 animals seized in a single case in 2011, while almost 6,000 Indian star tortoises were seized during the six year period.

Illegal shipments were found to enter by air from countries in East Africa and South Asia, and by road from neighbouring countries through overland routes along the Mekong coast and at other border crossings.

Tortoises and freshwater turtles are commonly traded for food, medicine and the exotic pet trade. Trade in these species is prohibited or restricted under various national and international legislations, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Additionally, in Thailand permits are required for the import and export of all wildlife.

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US Fish and Wildlife Service Proposes Trade Protections for Four Native Freshwater Turtles

A booming international trade in turtles has put pressure on populations across the country and has led to concern about the long-term survival of several species. The U.S. Fish and Wildlife Service announced a proposed rule to address the growing threat of illegal take and trade in native turtles. If finalized, this action will bring four native freshwater turtle species – the common snapping turtle, the Florida softshell turtle, the smooth softshell turtle and the spiny softshell turtle – under the protection of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and require exporters to obtain a permit before shipping turtles overseas.

Freshwater turtles and tortoises are collected, traded and utilized in overwhelming numbers. Bringing these turtle species under CITES protection will allow the Service to better monitor international trade, determine the legality of exports and, in consultation with State wildlife agencies and other experts, decide whether additional conservation efforts are needed. It will also enlist the assistance of 179 other countries that are part of CITES in monitoring trade in these species.

“Wildlife trafficking is not just a danger to foreign species. Native wildlife, including paddlefish, live reptiles and sharks, as well as plants such as ginseng, are poached and illegally traded,” said Bryan Arroyo, Assistant Director of International Affairs. “We work closely with State wildlife agencies to protect native species and ensure that trade is legal and sustainable, particularly for species at greatest risk of overexploitation.”

While none of the four turtle species proposed for protection is currently in danger of extinction, a growing international trade, especially to fuel increasing demands in Asian markets, poses a threat to the future of these species.

The global trade in turtles in the last 20-plus years has followed a boom-and-bust cycle whereby a sought-after species is depleted in the wild or regulated, causing trade to shift to other species. International trade in turtles is most common in Asia, with supplier countries feeding well-established legal and illegal trade networks supplying markets in East Asia, principally in China. Here, turtles are used primarily as food and in traditional medicines, although a growing pet trade across the region and in other parts of the world is increasingly impacting a

number of threatened species.

This proposed rule follows the successful Sixteenth Meeting of the Conference of the Parties (CoP16) to CITES, where the United States collaborated with China and Viet Nam to increase protection for a number of Asian freshwater turtles. In total, three native turtle species and 44 species of Asian freshwater turtles received increased CITES protection at CoP16.

For more information on CITES and how it operates, including Appendix-III listings, visit:

www.fws.gov/international/cites/how-cites-works.html.

The Service is seeking public comments for 60 days regarding information pertaining to these four turtle species. Please go to www.regulations.gov Docket No. FWS-HQ-ES-2013-0052 for additional information. The proposed rule will publish in the Federal Register on October 30, 2014, comments must be received by December 29, 2014.

Vanessa Kauffman
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FDA Develops Online Learning Modules to Help Ensure Proper Labeling of Seafood Products

The U.S. Food and Drug Administration has developed on-line learning, video modules to help the seafood industry, retailers, and state regulators ensure the proper labeling of seafood products offered for sale in the U.S. marketplace. Proper identification of seafood is important throughout the seafood supply chain to ensure that appropriate food safety controls are implemented and that consumers are getting the type of seafood they expect and for which they are paying.

The 3-part modules provide an overview of the federal identity labeling requirements for seafood offered in interstate commerce; a list of the specific laws, regulations, guidance documents, and other materials pertinent to the proper labeling of seafood; a description of the FDA's role in ensuring the proper labeling of seafood; and tips for identifying mislabeled seafood in the wholesale distribution chain or at the point of retail.

The FDA encourages anyone involved in the processing, distribution, sale, or regulation of seafood sold in the U.S. to use the modules to help ensure the proper labeling of the seafood products for which they are responsible. The video modules are available at <http://tinyurl.com/kbwrbbq>.

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A new five-year plan to manage the health of Australia's aquatic animals

Australia's National Strategic Plan for Aquatic Animal Health outlines the shared vision of governments and aquatic animal industries for a sustainable and prosperous future of Australia's fisheries and aquaculture sectors, valued at \$2.3 billion in 2012. AQUAPLAN outlines agreed industry and government priorities to improve national biosecurity and health management policies.

The plan was endorsed in August 2014 by the Agriculture Ministers' Forum and by aquaculture and fisheries industries through the National Aquatic Animal Health Industry Reference Group in January. Industry and governments are jointly responsible for implementing the plan and will work together to achieve the objectives and to ensure Australia remains a leader in aquatic animal health management.

AQUAPLAN 2014-2019 has five objectives, each of which is supported by activities that address specific aquatic animal health management issues. They include:

1. Improving regional and enterprise-level biosecurity
2. Strengthening emergency disease preparedness and response capability
3. Enhancing surveillance and diagnostic services
4. Improving availability of appropriate veterinary medicines
5. Improving education, training and awareness.

Over the next five years the department will lead on a number of activities to improve awareness of nationally significant aquatic animal diseases and will investigate the use of mobile technology to enhance reporting. Australia's Department of Agriculture will coordinate a review of the existing Aquatic Animal Health Training Scheme (2013–14), and are looking to improve the breadth of comprehensive data in Australia's online database for aquatic animal diseases and pathogens.

AQUAPLAN covers aquatic animal health issues relevant to aquaculture, commercial fisheries, recreational fisheries, the ornamental fish industry, the tourism industry and the environment. Its objectives are supported by activities to address specific aquatic animal health management issues associated with infectious diseases of finfish, molluscs and crustaceans.

AQUAPLAN 2014–2019 is available at www.agriculture.gov.au/animal-plant-health/aquatic/aquaplan. For more information or to receive a hardcopy of AQUAPLAN 2014–2019, contact the Aquatic Pest and Health Policy team at aah@agriculture.gov.au.

Source: Australia Biosecurity Bulletin - Edition 5, 2014 (<http://tinyurl.com/pg4s6sf>).

FDA Investigation Finds Majority of Seafood is Labeled Correctly

November 4, 2014
Silver Springs, MD

The US Food and Drug Administration has released the results of a two year investigation into seafood labeling. The investigation has found that 85 per cent of seafood tested was properly labeled, demonstrating that the problem of mislabeling is not as widespread as first thought.

The work included seven hundred DNA samples collected from wholesalers in 14 states, prior to restaurant or retail sale. The FDA also targeted types of seafood most often suspected to be mislabeled. The identified mislabeling was found in two species, snappers and groupers, which represent less than two per cent of total seafood sales.

"This extensive federal analysis brings the challenge of mislabeling into a much clearer focus," said John Connelly, President of the National Fisheries Institute (NFI), "while at the same time calling into question other mislabeling 'studies' that suggest the issue is widespread and in need of a legislative fix."

NFI has previously called for more enforcement of federal and state labeling laws, rather than new legislation, noting that multiple anti-fraud laws already exist. "What the FDA found reinforces the need for implementation of rules already on the books," said Lisa Weddig, Secretary of the Better Seafood Board (BSB). "We do not need more regulations and rhetoric, we need more enforcement."

The BSB and the National Restaurant Association work together on the labeling issue through a memorandum of understanding that includes educational outreach and even menu audits.

See (<http://tinyurl.com/lpwhvsw>) for the full story. The full FDA report is available at <http://tinyurl.com/km24el7>.

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MEETINGS OF INTEREST TO AQUATIC VETERINARIANS

Veterinarians attending these meetings may be awarded veterinary CE/PD credit towards annual re-licensure or re-registration to practice veterinary medicine. Individuals should check with the organizers to see if CE/PD certificates are provided.

An Overview of Aquatic Animal Medicine for the Veterinary Practitioner

April 11-12, 2015

Aquatic Animal Laboratory Building
St. George's University
True Blue Campus
St. George's, West Indies, Grenada



PLAN AHEAD FOR THESE GREAT MEETINGS!

40th WSAVA Congress
Bangkok, Thailand
May 15-18, 2015



WAVMA members will be presenting full days of Aquatic Veterinary Medicine lectures at the 2015 WSAVA Congress in Bangkok, Thailand. Plan ahead to attend this meeting.

<http://www.wsava2015.com/congress-information/about-wsava>

Registration fee is USD \$250.00 for "An Overview of Aquatic Animal Medicine for the Veterinary Practitioner". Registration will be online only. You will receive an auto-confirmation of your registration. You will also receive a registration package on arrival, which will include the course schedule and other materials.

Contact:

Dr. Gregory Wybern

gwybern@sgu.edu

Phone: 1-473-439-2000 ext. 3789

http://www.squalumnicommunity.gd/events/event_details.asp?id=524181



2015 AQUAVET® I & II & III

The College of Veterinary Medicine at Cornell University is pleased to announce the 2015 AQUAVET® I, II & III Programs. They are aquatic veterinary medicine education programs (introductory and advanced) that will be presented at various venues in 2015. Veterinary students can receive credits for the course and graduate veterinarians can receive CE credits. Specific information can be found at www.aquavet.info. Applications due by January 15, 2015.



2015 Building Exotics Excellence: One City, One Conference



Exotics Convention
Hosted by AAV, AEMV and ARAV
August 29 - September 2, 2015
San Antonio, Texas
Marriott Rivercenter

VISIT EXOTICSCON.ORG

[SUBMIT A PROPOSAL](#)

Proposal Submission

The deadline for proposal submission is **January 2**.

Coming Soon!

The Exhibitor and Sponsor Prospectus will be available soon. Make plans to showcase your company as an exhibitor or sponsor of ExoticsCon. Details will be emailed and available on the website. Please contact meetings@exoticscon.org if you would like a prospectus.

Conference Features:

- Five Tracks
- Pre-conference Workshops (Saturday, August 29)
- Labs (Sunday, August 30)
- Zoo Outing and Reception (Tuesday, September 1)
- Booth and Tabletop Exhibition
- Networking Opportunities



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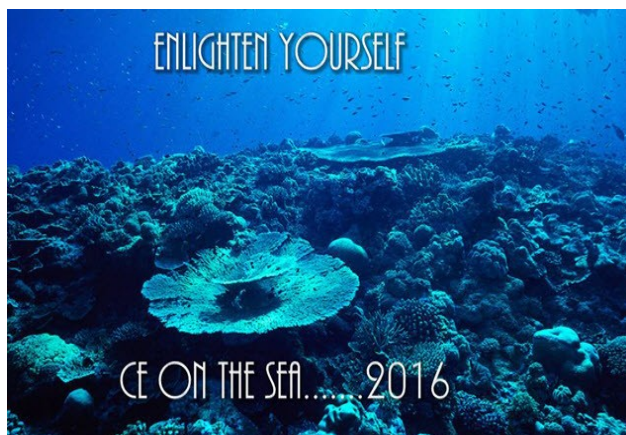
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CE on the Sea 2016
March 17-21, 2016



The Bright (and Sunny) Idea

VetTechLife, with some help from VetMedTeam, is hosting a CE event that will "float your boat." VetTechLife and VetMedTeam, giants in veterinary continuing education have joined together to provide a continuing education event that blows others out of the water. Mark March 17-21, 2016 on your calendar for this awesome event!

Join others in the veterinary profession for a CE event that caters to the entire veterinary team. And catering truly mean "catering". Welcome aboard Royal Caribbean's *Independence of the Seas* for tailored continuing education, small class sizes and one-on-one exposure to speakers that want you to get the most out of this event.

This event offers gourmet food, balcony state-rooms and many little extras that will make this a truly unforgettable experience.

For info on dates, room and registration rates, as well as ship amenities and CE info, visit the [VetTechLife Veterinary CE on the Sea 2016](#) Facebook page.

IAAAM 2015 Conference

April 6-11, 2015
Chicago, IL, USA

Registration for the 2015 IAAAM Conference (April 6-10) & associated workshops (April 11) is now open. To take advantage of early registration fees for the conference and all associated events, be sure to register prior to March 1, 2015. In addition, consider attending the following workshops after the IAAAM Conference (Saturday, April 11):

American Association of Fish Veterinarians (AAFV) Workshop

The 2nd annual AAFV meeting (8:00 am to 8:00 pm at the Shedd Aquarium) with lectures covering clinically-relevant fish veterinary issues for RACE-approved CE. Registration fees (includes lunch, and dinner) is \$150 for AAFV/IAAAM members, \$200 for non-members, \$75 veterinary students and will be limited to 50 participants. Please contact Dr. Brian Palmeiro petfishdoctor@gmail.com or visit www.fishvets.org for more information.

CL Davis Pathology Workshop

Registration before March 1, is \$100 (\$125 thereafter) and includes continental breakfast, refreshments, syllabus, and a DVD of the case slides for review. For more info, visit: <http://www.cldavis.org/courses/upcoming.html>.

Marine Mammal Radiology Workshop

The 3rd annual IAAAM Marine Mammal Radiology Workshop will be from 9 am-12 pm at the Shedd Aquarium. Presented by board-certified radiologist Marina Ivančić of AquaVetRad and the National Marine Mammal Foundation. A \$10 fee will be required, with coffee provided. For more information, please contact Dr. Ivančić at marina@aquavetrad.com.

Marine Mammal Water Quality Workshop

Registration fee (includes lunch) is \$25 and the workshop is limited to 50 participants. For more information, please contact Dr. Ivančić at marina@aquavetrad.com.

For complete registration, accommodation, abstract submission, student travel awards, and other information, go to www.iaaam.org/2015-iaaam-conference-and-meeting.

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International Conference on Avian herpetological and Exotic mammal medicine

International Conference on Avian, Herpetological and Exotic Mammal Medicine (ICARE)

April 18 - 23, 2015

Paris, France

After a very successful and exciting "1st International Conference on Avian, Herpetological and Exotic Mammal Medicine" (1st ICARE) in Wiesbaden, Germany in 2013, all participating organisations have decided that this important veterinary symposia should continue every two years touring through Europe.

We are proud that the European Committee of the Association of Avian Veterinarians (EAAV), the Association of Exotic Mammal Veterinarians (AEMV), the Association of Reptilian and Amphibian Veterinarians (ARAV) and the European College of Zoological Medicine (ECZM) have decided that the 2nd International Conference on Avian, Herpetological and Exotic Mammal Medicine (2nd ICARE) will be held in 2015 in Paris, France (April 18 - 23, 2015). All organizations (EAAV, AEMV, ARAV, ECZM) are participating in a newly formed ICARE Steering Committee to select suitable locations and support the local organising committees for future conferences.

In preparation of the 3rd upcoming ICARE in 2017 the ICARE Steering Committee seeks proposals! If interested in organising ICARE 2017 please send your proposal before 31.03.2014 via email to Dominik.fischer@vetmed.uni-giessen.de.

On behalf of the ICARE Steering Committee,
Dominik Fisch

The Organizing Committee

Norin CHAI

Minh HUYNH

Charly PIGNON

Lionel SCHILLIGER

Commemorative Symposium on Reptiles and Amphibians

Saturday 24th January, 2015

Birkbeck College, London,

A half-day Symposium on the health, welfare and pathology of reptiles and amphibians will be held at Birkbeck College, University of London, 43 Gordon Square, London WC1H 0PD, on Saturday 24th January 2015. The meeting is organised in conjunction with the British Herpetological Society (BHS) supported by the British Chelonia Group (BCG). The Symposium will last from 1.00 pm (13.00) until 6.00 pm (18.00). Admission is free.

The Symposium marks the 120th anniversary of the birth of Dr Edward Elkan, pioneer of lower vertebrate pathology. His research and writings on diseases and pathology contributed much to the health and welfare of reptiles and amphibians and influenced a generation of veterinary surgeons, zoologists and herpetologists. The Symposium will mark the end of the series of Elkan Memorial Lectures instigated after Edward Elkan's death in 1983. However his Reference Collection of Lower Vertebrate Pathology, part of which will be on display at the Symposium, remains available for study by scientists and students - a long-term legacy of this great man.

The full programme for this Symposium will be published later in the year. In the meantime, expressions of interest, including offers to present a paper, should be addressed to:

Professor John E Cooper, FRCVS

Co-ordinator, Edward Elkan Memorial Lectures

ngagi2@gmail.com

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28 - 31 MAY 2015

Suntec, Singapore -

Aquarama is the leading biennial international ornamental fish, aquatic plants, invertebrates and accessories trade exhibition in the world (www.aquarama.com.sg). Throughout its history stretching back to 1989, it has attracted exhibitors, trade and public visitors from all corners of the globe. The 14th edition – scheduled to run from 28-31 May 2015 in its traditional home of Singapore, will be no different – with one important exception. In addition to its usual complement of visitors from the international ornamental aquatic industry and the general public (numbering in the many thousands), it has always attracted a small number of visitors from the public aquarium world, as well as some exhibitors who supply both the ornamental and public aquarium sectors.

This is now set to change dramatically with the organisers (UBM Media (Singapore) Pte Ltd) and a specially convened public aquarium committee launching a programme of sub-events aimed specifically at public aquarium personnel. This committee, consisting of Scott Dowd (Senior Aquarist at the New England Aquarium, Boston, USA), Ramón Barbosa (Senior Curator at the S.E.A. Aquarium in Sentosa, Singapore) and Rob Jones ('The Aquarium Vet' and veterinarian at the SEA LIFE Melbourne Aquarium, Australia) and co-ordinated by Aquarama Consultant, John Dawes, who is devising a programme of activities tailored fairly and squarely to the needs of the public aquarium industry, as well as the fostering of closer links between the home aquarium industry and public aquaria.

Up to now, these links have only been modest. However, if developed to their full potential, this would undoubtedly benefit both industries. For instance, there are several livestock suppliers within the ornamental sector that already service public aquaria, but the room for expansion and improvement is considerable but, as yet, largely unexplored. The same applies to manufacturers and suppliers of equipment, foods, treatments, services, etc.

In order to address these issues, Aquarama is dedicating over 50% of its available seminar and meeting time slots to a number of activities aimed at bringing both industries closer together than ever before.

Round Table Discussion: Chaired by Aquarama Consultant, John Dawes, this will consist of a panel of invited experts, comprising the three above-mentioned committee members, government representatives, ornamental aquatic industry leaders, plus livestock suppliers. Under the theme: **Engage, Influence and Collaborate: Maximising the Synergies of the Public and Home Aquarium Industries**, attendance will be free and open to all Aquarama trade and public aquarium visitors and exhibitors, and will consist of a minimum of 1½ hours of intense debate, action and Q&A's.

Seminar: This half-day programme of presentations from leading figures from the public aquarium world will feature topics of exclusive relevance to the industry, such as: **Artificial Reproduction Techniques in Sharks and Rays, Prolonged Transportation and Captive Husbandry of Manta Rays; The Initiative to Promote Conservation and Sustainable Management of Home Aquarium Fishes, led by the IUCN Species Survival Commission/Wetlands International Freshwater Fish Specialist Group (FFSG) and the Global Zoo and Aquarium Community; Initiative to Promote Socially and Environmentally Beneficial Home Fishkeeping**, plus several other topics which are currently being finalised.

Strategic Development Meeting: This in-depth session will discuss the IUCN's FFSG/public aquaria initiative set up to explore ways in which both industries can help drive environmental and socio-economic benefits, e.g. by identifying and promoting opportunities for sustainable management of wild populations of aquarium fishes that support livelihoods for communities living in regions of biological importance, thus fostering a powerful drive for conservation of these species as well as the habitats where they are found – achieved via well-informed consumer choices within the home aquarium industry. The team to explore this new, ambitious, and important initiative (under the chairmanship of committee member, Scott Dowd) will create a win-win-win scenario where the hobby gets an infusion of energy from zoos and public

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aquaria (which will showcase fish identified by IUCN's FFSG as key species), thus promoting fish-keeping; zoos and aquaria will get a new instrument to achieve their goals of in-situ environmental protectionism; rural communities can receive sustainable economic returns for stewarding aquatic resources and watersheds, and the ornamental industry becomes a main actor in facilitating ethical supplies and helping alleviate poverty. This important meeting will last for a full afternoon (approximately four hours).

Too often, meetings of great importance such as this take place at international conferences. Important conclusions are reached by very well qualified specialists. Unfortunately though, those findings and discussed action plans fade away shortly after the meeting. In order to guarantee lasting outcomes from our Strategic Planning Meeting, we have retained the services of The Facilitators Network Singapore with trained experts to help us run the most efficient meeting, capture all information and produce a working document which will serve as a road map that will enable us to follow through and accomplish the goals we agree upon at Aquarama 2015.

It is hoped that bringing public aquaria into Aquarama will benefit all parties, especially when added to the organiser's efforts to attract exhibitors who supply public aquaria but are currently unaware of the trade benefits and possibilities that Aquarama undoubtedly offers.

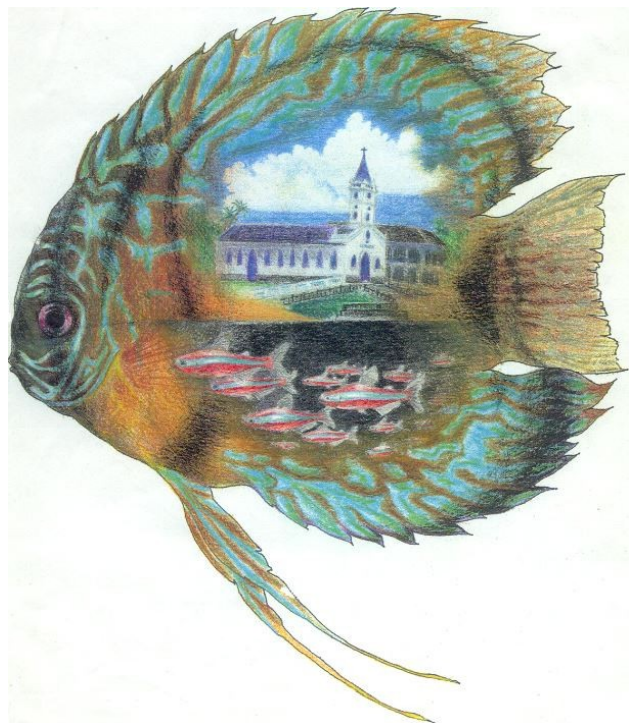
It is also hoped that by attracting visitors and exhibitors from public aquaria, these will gain an invaluable insight into an industry which they may be aware of, but know little about. These visitors will, for example, be able to witness at first hand a staggering array of fish, aquatic plants, invertebrates and equipment which they may never have come across before. They will also, of course, be able to source supplies of equipment, services and livestock for their own establishments, be able to attend the free ornamental aquatic trade and public seminars which form a traditional part of Aquarama, join the highly popular fish farm tour and marvel at the more than 1,400 entries in the general fish competition, as well as the specialised crystal bee shrimp, betta, marine aquarium, marine nano cube, freshwater planted aquarium, freshwater nano, and dragon fish (Asian arowana/bonytongue) competitions, which have helped make Aquarama the 'best ornamental aquatic exhibition' on the planet.

In the words of Jennifer Lee, event manager for Aquarama: "The ornamental aquatic sector has always supplied fish, plants and invertebrates to the home aquarium hobbyist, on the one hand, and public aquaria on the other. It could be said to lie in the middle, with the two sectors at either end of the spectrum. It is our aim to bring both ends much closer together than they've ever been before and establish our event as a 'must attend' fixture in the calendar of all stakeholders."

For further information on Aquarama, please visit www.aquarama.com.sg.



Illustrated Cardinal Tetra
Credit: Sally Landry



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Volume 8, Number 4 **INTERNSHIPS, EXTERNSHIPS & RESIDENCIES** Fourth Quarter 2014

SeaWorld (3-4 weeks)

SeaWorld offers externships at each of its 3 locations. There is one common application where you rank each park. Externs get to work with the wild birds that are brought for rehabilitation, even surgery! You are required to give a small presentation to the veterinary staff on the last week of your rotation. Housing is not provided, but there are lots of hotels in the area, including an extended stay hotel with a small kitchenette for around \$50/night.

The Marine Mammal Center (3-4 weeks)

Located in Sausalito, CA, the Marine Mammal Center is in the front-running for marine mammal rehabilitation and research. It is very seasonal, with more animals in the spring and summer. You will work with the veterinary staff 3-4 days per week, and then on crew, doing basic husbandry and feeding once or twice a week. Housing is provided with the veterinary intern and any other externs at one of the old fort houses nearby. It is highly recommended that you get a car for driving around. It is a beautiful area with lots of beach coast and hiking.

Mystic Aquarium

Mystic Aquarium in Mystic, CT, right near the coastal Rhode Island border, houses a large collection of marine mammals, fish and invertebrates. You work primarily with the veterinary intern, shadowing and assisting on procedures. You will also get very proficient in taking and processing analog radiographs. A presentation is required during this externship. No housing is provided, but you may want to ask if they know of anyone working at the aquarium who can provide you with a room for the time you are there. This is another rotation where you'll want a car to check out all the beaches nearby.

Georgia Aquarium

Atlanta, Georgia

Georgia Aquarium is one of the newest aquariums in the US. It has a new procedure suite and one of the most outstanding tanks in the world. Housing is not provided. You may not need a car since the aquarium is located in downtown Atlanta, GA.

Navy Marine Mammal Program (4 weeks)

The US Navy trains marine mammals to perform tasks underwater that cannot be performed by humans. This is a high priority for those interested in marine mammal medicine. This program is based in San Diego, CA and is highly competitive.

Vancouver Aquarium (2-4 weeks)

Located in Stanley Park of Vancouver, Canada, Vancouver Aquarium takes externs to work with their collection of mammals, birds, amphibians, reptiles and fish. A literature review project is required. Housing is not provided but they provide a guide on their website. Make sure your passport is up to date!

Georgia Sea Turtle Center (2-6 weeks)

The Georgia Sea Turtle Center is located on Jekyll Island along the southern coast of Georgia. They rehabilitate both sea turtles and native land turtles at their center. If turtles are your interest, this is one of the best facilities to participate in the latest research and rehabilitation techniques. A research project is required for non-4th year students that is financed by funding through your school. Housing available based on seasonality. A car is recommended.

National Aquarium (6-8 weeks)

Baltimore, MD

National Aquarium is located in Baltimore, MD and houses a large collection of fish, mammals, amphibians/reptiles and birds. This rotation gives hands-on experience with fish, birds, reptiles and amphibians. There is some work with mammals and other critters, but it is largely observational. Applications are accepted year round. A small presentation is required. No housing is available but there are lots of hotels in the area.

New England Aquarium (6-8 weeks)

Boston, MA

Located in Boston, MA, the New England Aquarium hosts a large collection of fish, birds, marine mammals and turtles. Their chief veterinarian, Dr. Charles Innis, is one of the most knowledgeable about cold stun in turtles and has made a significant contribution to researching their rehabilitation. Externs are required to prepare a case report and research paper with presentations for both. No housing is available, but there are lots of options nearby.

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ZOOLOGICAL MEDICINE INTERNSHIP COLLEGE OF VETERINARY MEDICINE, UNIVERSITY OF GEORGIA

Applications now being accepted for July 2015

The Zoological Medicine service of the Department of Small Animal Medicine & Surgery, College of Veterinary Medicine, University of Georgia offers a 1 year specialty internship in zoological medicine with a major emphasis on exotic companion species. The program starts 15th July 2015 and ends 14th July 2016. This program is supervised at the UGA College of Veterinary Medicine by Drs. Stephen Divers and Joerg Mayer. The individual will be trained to a high level and upon completion will have attained a broad clinical base in preparation for applications to zoological residency programs.

This is a non-degree graduate student program leading to an official University Certificate of Internship. All applicants must be licensed to practice veterinary medicine in their country of origin, and priority is given to those candidates that fulfill the following:

1) 1-2 years of practice experience in domestic animal, exotic, zoo or aquatic animal medicine, or completion of a 1-year small animal rotating internship. General clinical competency is essential.

2) Previous veterinary experience at a US institution with a reference from the supervising veterinarian (e.g. externships at US veterinary hospitals, zoos, aquaria, or private practices).

3) Excellent academic record with previous research experience and veterinary publications. (Submission of a class rank helps in the evaluation of non-US veterinary graduates).

The intern will be 100% dedicated to the zoological medicine service, within a new state-of-the-art Veterinary Teaching Hospital (including separate avian, reptile/amphibian, small mammal and wildlife wards; digital radiography, fluoroscopy, 3T MRI, 64 slice CT, diagnostic/surgical endoscopy, etc.). The majority of the clinical work will involve privately owned exotic pets, although involvement with wildlife and local zoo/nature centers is likely. The annual hospital and field caseload per house officer is approx. 500 cases/yr. The internship emphasizes clinical training in the principles of zoological medicine and surgery, and the species distribution is approximately: 45% avian, 40% mammals, 14% reptiles/amphibians, and 1% fish/

invertebrates. In addition to a supervising on-clinic faculty, resident, and two technicians, the intern is aided by 2-4 senior veterinary students on 3-week elective rotations. Specialists from all recognized disciplines are available for consultation and an extensive support infrastructure, typical of a veterinary college, is available. The intern is encouraged to attend and present at a national or international conference during the year, as well as attend lectures or seminars in the College of Veterinary Medicine or on the university campus.

The intern will work under the supervision of senior faculty members and service responsibilities include (1) participation in the daily activities of the medical service of the hospital including primary case responsibilities and case rounds; (2) participation in visits to Bear Hollow Wildlife Trail, and Sandy Creek Nature Reserve, and other local or regional centers; (3) providing assistance in instruction and supervision of veterinary students assigned to the zoological medicine service; (4) provision of emergency weekend and night-time back-up for exotic species admitted by the small animal and large animal emergency interns within the teaching hospital (on a rotating basis with the other zoological medicine house officers); (5) presentation of a seminar to the College during the year, and active participation in UGA-aquarium rounds, and zoological journal club/didactic rounds.

In addition to clinical training, exposure to investigative approaches and publication is an essential component of the program, and the intern is expected to produce at least one peer reviewed publication during their program year.

Applications must include (1) a letter of application including telephone and email contact details, (2) a curriculum vitae, (3) and three letters of reference. International applicants must also submit TOEFL scores and university transcripts. All materials should be mailed to Ivy Blackwell (Zoological Medicine Internship), Dept. of Small Animal Medicine and Surgery, College of Veterinary Medicine, University of Georgia, 501 DW Brooks Drive, Athens, GA 30602, USA. The deadline for full consideration is January 5th 2015; however, the position will remain open until filled. The status of the position and further information can be obtained by contacting Ivy Blackwell on 1-706-542-8121 or ivyb@uga.edu.

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Aquaculture Veterinarian in Australia

Our client is a major Australian aquaculture group that produces fresh Atlantic salmon and rainbow trout and is recognised globally as being a premium producer of fresh and smoked salmonid products. This dynamic group now requires an experienced Aquaculture Veterinarian. The ideal candidate will fulfil a senior role in the farming operations team, including responsibility for the management of fish health, biosecurity and fish welfare across all hatchery and marine farm sites operated by the company. The role will also be heavily involved in the company's R&D program.

Ideally we are seeking an experienced aquaculture Veterinarian, however are willing to consider training a more inexperienced candidate with an enthusiasm for a career in salmonid production. The final position and salary package will depend on knowledge and experience.

Veterinary Science qualifications recognised in Australia are essential as is a current driver's licence and sound computer skills. Boat/diving certificates and/or experience is desirable but not essential. The role will require regular work out of normal business hours including occasional weekends.

This is an outstanding career opportunity with a major and rapidly growing aquaculture group but is also an incredible lifestyle opportunity.

Please apply directly to Dr. Ray Johnson, Managing Director, Agricultural Appointments via email ray@agri.com.au or call +61419012841 for a confidential discussion.

Veterinary Internship in Aquatic Animal Health

The University of Florida's College of Veterinary Medicine (Aquatic Animal Health Program) and Tropical Aquaculture Laboratory (UF-TAL) (School of Forest Resources and Conservation) in partnership with the Florida Fish and Wildlife Conservation Commission (FWC) Marine Mammal Pathobiology Laboratory (MMPL), the Florida Aquarium, Tampa's Lowry Park Zoo, SeaWorld of Florida and Volusia County Marine Science Center have developed a two-year post-DVM training opportunity in aquatic animal health. This veterinary internship will provide veterinary experience in the areas of marine mammal medicine, stranding response, public aquarium, zoo, research, and aquaculture medicine.

The position will be available July 1, 2015 and the successful incumbent will spend the first year in a rotating intern program that will be based in Gainesville, Florida with time at the College of Veterinary Medicine with the AAHP faculty, zoo medicine, radiology and anesthesia services as well as the Wildlife and Aquatic Veterinary Diagnostic lab (WAVDL) laboratory. There will be an emphasis on clinical research development, including molecular diagnostic techniques for their first year research project. There will be also rotations available at SeaWorld of Florida, Lowry Park Zoo (Tampa FL.), Volusia County Marine Science Center, and the Marine Mammal Path Laboratory, with additional time available at Clearwater Marine Aquarium, the Tropical Aquaculture Laboratory and other Florida partners.

A DVM or equivalent degree is required. Demonstrated research, pathology experience and a track record in publication of research results is highly desirable. Candidates with demonstrated clinical proficiency with non-domestic species will be viewed favorably.

Qualified candidates are requested to submit a letter of application, curriculum vitae, and three letters of reference. All of the above must be post-marked by January 25, 2015 to be considered for initial screening. The University of Florida is an Equal Opportunity Employer.

Please send applications to Nina Thompson, AAHP Program Assistant, Department of Large Animal Clinical Sciences, College of Veterinary Medicine, PO Box 100136, Gainesville, FL 32610-0126; phone 352-294-4198, e-mail: nina.thompson@ufl.edu.

**DO YOU HAVE A STORY TO TELL
ABOUT HOW YOU BECAME
INVOLVED WITH AQUATIC
VETERINARY MEDICINE?**

Send your article (<1,000 words) with pictures to
AVNeditor@wavma.org.

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Assistant/Associate/Full Research Professor & Veterinary Scientist (DVM/PhD or DVM/MS)

Florida Atlantic University's Harbor Branch Oceanographic Institute (HBOI) located in Ft. Pierce, FL, seeks a highly motivated, qualified veterinary scientist with research experience related to aquatic animal health. This scientist will be appointed at the Assistant, Associate, or Full Research Professor level, dependent upon qualifications. The scientist will be expected to develop a strong research program that integrates with existing research and new research opportunities at Harbor Branch and FAU colleges and campuses.

The scientist will work with internal and external collaborators while participating in clinical programs including: health assessments and stranding responses; rehabilitation activities; and environmental studies. The successful candidate will be expected to obtain external funding to successfully maintain and grow the program, and will participate in educational activities through training MS and PhD students and leading educational programs in aquatic animal health. The appointed veterinarian will also serve as an IACUC member bringing expertise on marine mammal and other marine species research to the committee and act as the Clinical Veterinarian responsible for overseeing IACUC protocols and associated activities at HBOI while working closely with the FAU Attending Veterinarian and FAU's Division of Research.

REQUIRED:

- Doctor of Veterinary Medicine (DVM or equivalent) from an AVMA accredited program
- Additional graduate training to the M.S. or Ph.D. level, preferably in an area related to aquatic animal health such as pathology, microbiology and immunology, environmental medicine, toxicology, and/or environmental science
- Evidence of research productivity consistent with rank
- Must be licensed to practice veterinary medicine in the state of Florida or ability to acquire

PREFERRED:

- Training and experience in marine mammal research
- Evidence of strong program management skills consistent with rank

Training and experience in any of the following areas: infectious diseases, pathology, immunology, toxicology, wildlife medicine, conservation medicine, environmental health or medicine, or related fields

Clinical experience with marine mammals and other aquatic species desired

Experience with supervision of graduate students desired

To Apply:

This position is open until filled and may close without prior notice. All applicants must apply electronically to the currently posted position on the Office of Human Resources' job website (<https://jobs.fau.edu>) by completing the Faculty, Administrative, Managerial & Professional Position Application and submitting the related documents. Please apply for position #980505. The site permits the attachment of required/requested documentation. In addition to completing the online application, please upload the following: cover letter, CV, copies of official transcripts scanned into an electronic format, a statement of research experience and philosophy, and contact information for three references including email addresses. Degrees from outside the United States must be validated by an organization belonging to the National Association of Credential Evaluation Service (NACES), with an indication of the documents the evaluation was prepared from (official transcripts, diplomas, dissertation abstracts). The evaluation should be scanned and electronically attached to one's application as with other US-based transcripts.

HBOI faculty and staff lead robust programs in estuarine, coastal and deep-sea research that include marine mammal research and conservation, population biology and behavioral ecology, marine ecosystem health, ocean exploration, aquaculture and stock enhancement, marine biomedical and biotechnology research, ocean engineering and technology, and ocean dynamics and modeling. Please see www.fau.edu/hboi for more information.

For further information contact:

Peter McCarthy, PhD, Search Committee Chair
Harbor Branch Oceanographic Institute
Florida Atlantic University
5600 US 1, North Fort Pierce, FL 34946
772-242-2400
pmccart5@fau.edu

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Self-cleaning (!?) small aquarium for Betta fish found at a local department store. The waste water flows out from under the filter plate at the bottom of the tank when new water is poured into the tank at the top. The idea is that the fresh water will push out solid waste that collects below the rocks on the bottom as the water flows out the waste spigot.

*Photos by
Nick Saint-Erne*





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