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The Aquatic Veterinarian

Preserving Oblong Turtles in Western Australia.
See related article on page 29

Volume 9, Number 1
First Quarter, 2015

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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Editor's Note

Welcome to an exciting new year and another edition of The *Aquatic Veterinarian*. You may notice some subtle changes to this volume. We tried to keep the format similar to the last two volumes, but made a few changes to allow more text per column in order to provide more action-packed information to our readers. We've kept the cover concept for this volume the same as the last two years for continuity. Let me know if you like that or if it is time for a new look (for 2016!). Any feedback, positive or negative, is appreciated to help bring you the best information in the best format.

We will continue to deliver the magazine in a digital format available to download on our WAVMA.org website. When you open the Portable Document Format (pdf) of *The Aquatic Veterinarian* that you download from the website, http://www.wavma.org/Aquatic-vet-newsletter-for-members.cfm? you can use the free Adobe Reader (download from: http://get.adobe.com/reader/) to view it. There are also other free and purchased viewers that will work for viewing pdf files.

The reason for using the Portable Document Format is that it is "an open standard for electronic document exchange maintained by the International Organization for Standardization (ISO). When you convert documents, forms, graphics, and web pages to PDF, they look just like they would if printed. But unlike printed documents, PDF files can contain clickable links and buttons, form fields, video, and audio — as well as logic including word search functions. When you share a PDF file, virtually anyone can read it using free Adobe Reader® software or the Adobe Reader mobile app." [Information above from Adobe website: http://www.adobe.com/products/acrobat/adobepdf.html]

So all of the blue links to websites or email addresses you see on your computer screen when you read the magazine are 'clickable' to take you to a website or open an email. The table of contents are also clickable to take you to that article when you click on the blue page number at the end of the title. Obviously (I hope!), when you print out *The Aquatic Veterinarian* to read, the links don't work when you poke them with your finger on the printed page.

The issue is also intended to be read as a two-page spread. You can do this by going in Adobe Reader to the top menu and selecting 'View,' then 'Page Display,' then 'Two Page View.' Now you will see the cover page by itself, then each successive screen will show two pages side-by-side. At least, that is the way I like to read it. More like the old-school paper magazines…

I hope you enjoy this issue,

Nick Saint-Erne, DVM, CertAqV
Executive Editor
AVNeditor@WAVMA.org

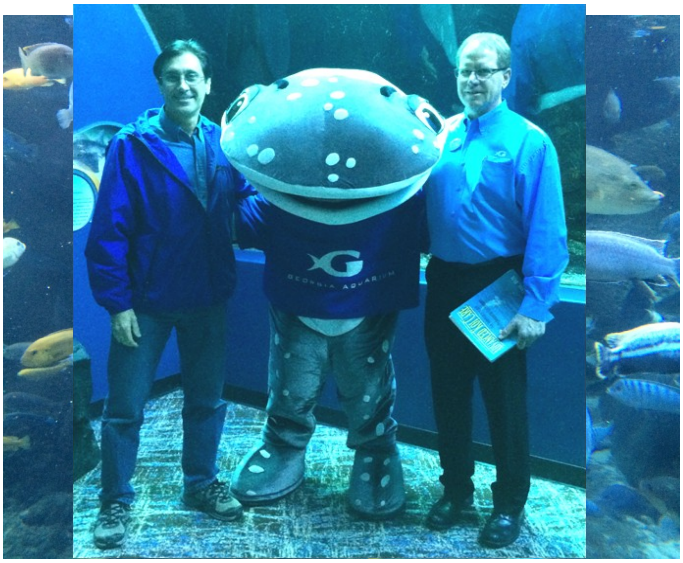
Download a QR reader onto your Smart Phone and scan the Quick Response Code to the right. It will take you to the WAVMA.org website page for accessing all of the past WAVMA Newsletters.

You will need your WAVMA User ID and Password to access the most recent back-issues of *The Aquatic Veterinarian.*

Cover Photo:
By Richmond Loh

Preserving Oblong Turtles in Western Australia.
See related article on page 29.

Photo below:
Your Editor, Nick Saint-Erne, with a whale shark and Dr Tim Mullican at the Georgia Aquarium.
See Article on page 22.



EXECUTIVE REPORTS

President's Report

Dear Colleagues - Welcome to the 2015 membership year which promises to be one of the best ever! Before sharing WAVMA's plans for this year there are two things I would like to do. Firstly, I would like to thank Dr Richmond Loh for the immense time and effort he put in to his presidential year helping to move many WAVMA programs forward and increasing WAVMA's global presence and recognition. Dr Loh will be a hard act to follow! Secondly, I would like to ask two questions and provide my own thoughts on them, hopefully to stimulate others to share how WAVMA is doing and how WAVMA can improve. It is only by listening and understanding members' wishes that an organisation can move forward.

My broad questions to members: How successful is WAVMA in following its Mission Statement (www.wavma.org/About-wavma)? What does WAVMA mean to you? Simply mail your thoughts to President@wavma.org.

In 2015, WAVMA attracted a large number of new members, particularly veterinary students from around the world. **I suspect that WAVMA's Listservs, WebCEPD, Clinical Corner, and being able to network and learn about the wonderful world of aquatic veterinary medicine** encouraged many to become members. Additionally, the educational support program (www.wavma.org/scholarships) that awarded 22 students and newly graduated veterinarians, small grants to attend meetings and other projects, and the formation of new student chapters, (www.wavma.org/WAVMA-Student-Chapters) certainly helped build student membership. **WAVMA, without doubt is helping to nurture the next generation of aquatic vets globally**.

Full members also benefited from these services and other member programmes, including the WebCEPD Programme (www.wavma.org/WebCEPD) that helps fulfil annual CE/CPD requirements. In addition, through WAVMA's Cert AqV program (www.wavma.org/CertAqV-Pgm) a number of members can now demonstrate to their clients that they have the professional knowledge, skills and experience (KSEs) to provide veterinary services to their aquatic patients. **Moreover, WAVMA is helping demonstrate what core competencies are needed in aquatic veterinary education.**

Continuing the educational theme, as an affiliate member of both the World Veterinary Association (WVA) and the World Small Animal Veterinary Association (WSAVA), WAVMA has been able to organise aquatic veterinary educational programs or streams at the WVA Congress since 2005 and, from this year, an **aquatics stream at the WSAVA Conference for the first time ever**. Through these affiliations, WAVMA has been able to build bridges with numerous veterinary and non-veterinary organisations around the world, including OIE and FAO. Consequently, **WAVMA has promoted aquatic veterinary medicine within our profession, but also to those outside the profession**. To me WAVMA is and will continue to be very successful in fulfilling its Mission Statement.

Equally important, WAVMA has introduced me to many new friends and colleagues from around the world. **It has allowed me to see aquatic veterinary medicine as it is practised in numerous countries, increasing understanding between them, and exchanging knowledge and ideas**. At a time when the world is shrinking, these collaborations become more and more crucial. Personally, WAVMA has helped me develop my professional skills and knowledge. As an organisation with global reach, it is important that we continue to be the conduit of shared knowledge to improve, promote and expand aquatic veterinary medicine. **To me it is an altruistic organisation prepared to share and build resources for the benefit of the aquatic veterinary community globally**.

It is somewhat of a tradition for the in-coming President to set out what he/she would like WAVMA to achieve during their presidential year and, as more programs come to fruition, starting something new or unique becomes harder. However there are three general themes I would like to pursue: 1) consolidate and expand on existing programs; 2) collaborate with and share resources with other aquatic veterinary organisations for the benefit of all; and, 3) improve accessibility to, and sharing of, knowledge between members. Much of this will be achieved by developing further the online tools WAVMA has already been using.

The first of these is really "business as usual", with getting the Executive Board to review WAVMA programmes and determine how to optimise financial and volunteer resources to improve and maximise member benefits. Two areas come to mind; the first being to establish better use of member's expertise in expanding the Clinical Corner and encourage members to watch videos of clinical cases, download hand-outs and discuss them online. This discussion can then become a valuable repository of information and opinion. In a similar vein I would like to see us develop an easily accessible archive, or summary of key listserv discussions. **Over the years, the WAVMA Members-L listserv has generated some excellent discussion and reflects WAVMA member's willingness to help colleagues**. I'm pleased to say that the Executive Board has recently started looking into how we can address these two issues, and we hope to make an announcement during the first quarter of the year.

The second theme of **collaborating and sharing resources with other veterinary organisations** is a principle that WAVMA was founded on. It is enshrined in WAVMA's Mission Statement and Bylaws. There are some things that an international organisation can do better than a national organisation, and vice versa. Moreover, all veterinary organisations around the world, and aquatic veterinary medicine in particular, face similar obstacles and challenges, yet they have the same overall objective – **to advance the profession for the betterment of animals, society at large, and the world we live in (a true "One Health" concept). This should be the stimulus for mutual recognition and collaboration!**

Once again, two issues come to mind. The first is ensuring that WAVMA's aquatic veterinary education programs and other programs to assist students and new graduates, are truly international. **By working collaboratively with other organisations with interest in aquatic veterinary medicine we can maximise and expand what is available, and optimise the return on investment of money and people's expertise**. To me it makes good sense, and I will work hard to expand on **an initiative started in 2014 to enable open discussion between different organisations through the formation of an International Aquatic Veterinary Council**.

The third theme of improving accessibility and sharing of knowledge encompasses the other two themes. But it also brings me to what I see as critical to the success of my year as President. This is to expand and fully exploit the World Continuing Education Alliance (WCEA) portal that WAVMA has invested in for bringing web-based on-line educational

opportunities or e-Learning to anyone throughout the world. Members may be aware that this portal is now functional and currently being used to **allow anyone to access WAVMA's live and recorded educational webinars through our website (www.wavma.org/WebCEPD). Moreover, if other aquatic veterinary organisations are interested in collaboration, we have the ability to host their webinars for CEPD purposes and serve a global audience of veterinary organisations and individuals**. With careful development we hope to incorporate a new PubCEPD Programme where participants can study peer-reviewed publications for CE/CPD credit and identify which e-Learning might be useful for the CertAqV credentialing. **The possibilities for using this e-Learning system are endless, but of a more concrete nature I would like to use this portal to host a "virtual conference" towards the end of 2015**. This will enable WAVMA to demonstrate the system's versatility, allowing the maximum number of people to attend a WAVMA conference in their own time without the additional costs of travel and hotels. I hope to encourage sufficient members and non-members to contribute presentations and posters that may fill two to three days of aquatic veterinary medicine CE/CPD.

If all of us assist, from the Executive Board to student members, in achieving the above, then I believe WAVMA will have another year of success and growth and will fulfil its Mission and provide members with great value and service. To paraphrase Dr Loh, by working together, the faster we achieve our common goal.

I wish all of you the best for 2015.

Chris Walster, *BVMS MVPH CertAqV MRCVS*,
2015 WAVMA President
President@WAVMA.org

Secretary's Report

Dear WAVMA members, I hope that 2015 has begun quite nicely for all of you and that the rest of the year will be progressive and prosperous. First I wish to thank the members of the Board of 2014 for their hard work and commitment. In the same breath we welcome the new members of the board for 2015, Drs. Chad Harris, Laura Urdes and Sharon Tiberio. I wish them well.

WAVMA has started the year guided by our incoming president Dr. Chris Walster building on the gains in the past year under the stewardship of Dr. Richmond Loh. While we continue to provide the customary member services, it is our intention to broaden this scope as much as possible. I again reiterate our desire to obtain your suggestions on how we can be of better service to you. A synopsis of our achievements in 2014 can be found at www.wsava.org/WAVMA.htm, WAVMA's page on the World Small Animal Veterinary Association's website.

I thank all of you that have renewed your membership for this year. Members are reminded that membership runs from the 1st of January through the 31st December each year. Dues payment can be made online through a secure credit card payment system in your member profile or paid through PayPal. Those who do not pay their 2015 dues by the 1st April 2015 will be deactivated from the website. This means that although your original details will still be available to you, you will not be able to access the member's only section of the website or receive any benefits. If you log into your members profile you can check whether you have paid or still owe your 2015 dues. If you have forgotten your log in details or have any problem concerning the website then please email administrators@wavma.org. Member benefits include among others the ability to communicate with other aquatic veterinarians around the world through the listserv, the quarterly *The Aquatic Veterinarian* (TAV), and webinars that can be used to achieve your CEPD requirements for relicensure at considerably reduced cost.

Those who have successfully completed the Aquatic Veterinarian Certification process, I congratulate you. If you may be considering this or intend to embark on the process, more details are available at http://www.wavma.org/CertAqV-Pgm.

As was noted during the past year, our student members are increasing. I am pleased to announce that the process has begun to have a Students Committee established and we will see the students much more involved in the affairs of WAVMA. In this regard, we hope to have a mentorship program established where our experienced members can

serve as mentors to our student members, thus providing much needed guidance in the field of aquatic medicine. I encourage all members to be supportive in this regard.

We continue to collaborate with several international organizations such as the World Veterinary Association (WVA) and the World Small Animal Veterinary Association (WSAVA). In fact, we are currently preparing for the WSAVA congress in Bangkok from May 15-18, 2015, where we will be conducting an Aquatic stream for the first time at a WSAVA congress. For those unable to make it to Bangkok, the sessions will be streamed online; these details will be made available to you the members when available.

In closing I thank all the members for your support to us in the past and let us work together to achieve more gains in the area of aquatic veterinary medicine.

Devon Dublin, DMVZ, MSc. CertAqV
WAVMA Secretary
Center for Sustainability Science
Hokkaido University
Kita 9 Nishi 8,
Sapporo, 060-0809
Japan
Secretary@wavma.org

Treasurer's Report

By the close of 2014, the WAVMA cash assets increased by approximately $4800 from 2013. The 2014 treasury report reveals that WAVMA had more members join than anticipated, which offset the increased expenses above what was budgeted for website development incurred by the addition of the Webstore and CEPD webinars (see the Services & Equipment section in the table). Additionally, in 2014 twelve WAVMA members became credentialed as Certified Aquatic Veterinarians. The value of this program is evidenced by the fact that at the close of the first quarter 2015, we have already received payment for nine new CertAqV applications.

The addition of the monthly CEPD webinars has been well received. The positive response indicates that these webinars will likely prove to be a source of income for WAVMA as well as a valuable educational resource for our membership.

In an effort to reduce expenses, WAVMA now accepts PayPal for webinar, CertAqV and dues payments. Since credit card transaction fees can be steep, we encourage our membership to use PayPal in order to keep processing fees as low as possible.

The year 2015 is starting off well financially, with the Executive Board to review, edit and approve the 2015 Budget at the next Executive Board meeting in March.

Nick has been a phenomenal treasurer and an outstanding mentor, and I feel privileged to be able to follow in his footsteps as your treasurer for this upcoming year. As a WAVMA member, I am truly delighted to be part of such a professional and mutually supportive group of veterinarians.

Sharon Tiberio, DVM, CertAqV
2015 WAVMA Treasurer
Treasurer@WAVMA.org

SUMMARY	ACTUAL	BUDGETED
Total income	21,619.75	17,050.00
Total expenses	20,538.69	17,020.00
Income less expenses:	1,081.06	30.00

INCOME DETAILS	ACTUAL	BUDGETED
Veterinarian Memberships	11,400.00	9,500.00
Student Memberships	4,225.00	1,500.00
New Graduate Memberships	300.00	200.00
Other Memberships- AVO	1,000.00	850.00
Webinar/Meeting Income	194.75	1,000.00
CertAqVet application fees	3,500.00	2,500.00
Income - WAVMA merch		500.00
Donations / Sponsorship	1,000.00	1,000.00
Total income:	21,619.75	17,050.00

EXPENSE DETAILS	ACTUAL	BUDGETED
MEETINGS		
Annual General Meeting	3,034.04	3,000.00
AVMA Convention	400.00	500.00
AFS-DAA9/ FAVA / WVA		3,000.00
WSAVA		500.00
AVMA/AqVMC	956.37	1,000.00
SAVMA		100.00
Aquaculture America	1,385.62	
Total Meetings expenses:	5,776.03	8,100.00
ADMINISTRATIVE		
Illinois Secretary of State	10.00	36.00
Credit Card TXN Fee	1,004.67	720.00
Bank Fees	45.00	180.00
Fellowship Plaques		200.00
PayPal Fees	95.17	100.00
Office supplies		100.00
WAVMA Store Merch	10.80	50.00
Postage/Shipping		50.00
Promotions for Booths		100.00
Contributions	187.50	500.00
Organization Dues	999.46	934.00
AVMF Scholarship	1,000.00	1,000.00
Total admin. expenses:	3,352.60	3,970.00
SERVICE & EQUIPMENT		
Accounting - DD Pyle		100.00
Legal - DKM&O	125.00	200.00
Professional Management		100.00
Skype/Telephone		100.00
Survey Monkey/Citrix	893.00	200.00
Vimeo/ ProProfs/ WordPress	257.95	700.00
LiveDrive		650.00
2014 Website Hosting Account	1,388.50	1,000.00
Website Development	8,745.61	2,000.00
Total S&E expenses:	11,410.06	4,950.00

COMMITTEE REPORTS

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.
Chair: Sharon Tiberio, Treasurer@WAVMA.org

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.
Chair: Laura Urdes, laurau_2005@yahoo.com

Credentialing Committee

This Committee oversees and administers the CertAqV Program for credentialing aquatic veterinary practitioners, and evaluates aquatic veterinary educational programs useful to members.
Chair: Nick Saint-Erne, nsainterne@gmail.com

Meetings Committee

This Committee oversees and coordinates logistics for WAVMA-organized or sponsored aquatic veterinary educational meetings, including the Annual General Meeting.
Chair: Julius Tepper, cypcarpio@aol.com

Membership Committee

This Committee oversees membership issues to optimally serve individual members and the organization. Chair: Lydia Brown, drlydiabrown@gmail.com

Student Committee

This Committee facilitates networking between student members and helps development of student programs and services.
Chair: Devon Dublin, Secretary@WAVMA.org

Communications Committee

During the year 2015, one of the main objectives of the Communications Committee will be improvement of the communication with, and news dissemination amongst WAVMA members and the general public. In doing so, we will continue to develop the Wordpress and Members-L services, and soon we will start using the e-News emailing service, which is currently available on the WAVMA website (http://www.wavma.org/), but is not fully functional.

Like Wordpress, e-News allows us to reach members and non-members. However, in order for the system to be complete, we need to include the MailChimp programme. MailChimp is ideal to send out news to members and non-members, to monthly inform members of new member enrolments, CertAqV awards, etc. Once an article is placed in the e-News section of the website, it can be connected to all other social media accounts which WAVMA has, so is "one stop" for writing social media articles. A click on the link directs the user straight back to the article in e-News. This is important as by driving people to the website and adding pages to the website improves WAVMA Google ranking, which in turn rises WAVMA's online popularity.

There is another change that the committee has prepared to offer to the public: *The Aquatic Veterinarian* will have a new layout - special thanks to Nick for this! Indeed, TAV will have an exciting, brand new layout, which the reader shall be able to discover starting with the first quarter of this year issue.
We hope you enjoy it!

Laura-Daniela Urdes DVM PgDip PhD CertAqV
Communications Committee Chair
laurau_2005@yahoo.com

COMMITTEE REPORTS

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 their initiatives, and mentor applicants for Aquatic Veterinarian Certification (CertAqV).

Our WAVMA Distinguished Fellows 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?

Certified Aquatic Vets	Email Address
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Walster, Chris	chris.walster@onlinevets.co.uk
Weber, Scott	sharkdoc01@gmail.com

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 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-six aquatic veterinarians. Please welcome our latest Certified Aquatic Veterinarians:

Dr Stephen R. Reichley, DVM, CertAqV
Dr Greta Van de Sompel DVM, CertAqV
Dr E. Scott Weber, DVM, CertAqV

There are an additional fourteen other WAVMA members currently in the process of being certified. For more information, see the WAVMA website: **http://www.wavma.org/CertAqV-Pgm.**

Nick Saint-Erne, DVM, CertAqV
2015 Credentialing Committee Chair

COMMITTEE REPORTS

Membership Committee

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

As an update for membership committee, we have not had any committee meetings this year. However, the International Aquatic Veterinary Council (IAVC) met on 30 Jan 2015 and the minutes of the meeting were presented to the WAVMA Executive Board. The IAVC meetings are facilitated by WAVMA and I am our representative to this Council. See separate notice about the IAVC conference call.

Our Membership Committee team comprises of 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).

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

International Aquatic Veterinary Council (IAVC)

The IAVC consists of organizations of aquatic veterinarians from around the world. These organizations and their representative are:

WAVMA — Lydia Brown (UK)
AVMA Aquatic Veterinary Medical Committee —Esteban Soto Martinez (USA)
FVS — Jimmy Turnbull (UK)
MEVEA — Julio Mendoza (Chile)
Norwegian Aquatic Vet Association — Cecilie Skjengen (Norway)
AAFV — Helen Sweeney (USA)

The purpose of IAVC is to:
Share information between the member groups,
Discuss items of importance to our organisation with each other member organization.

We represent our organisations but do not have the mandate necessarily to speak for our organisation.

We agreed:
- WAVMA will continue to provide administrative and organisational support through Lydia Brown.
- To use a Dropbox/IAVC folder to store all our papers and share relevant paperwork.
- Once the meeting minutes are agreed as accurate we will share them with our organisations, who will discuss them and may come back to us with topics for future discussion.
- A twice yearly internet-enabled meeting with email working between meetings.
- A main future discussion topic for the next meeting will be agreed on over the next few months as organisations discuss what they would like for us to talk about.
- We will be transparent.

Topics which concern our organisations and specific points raised:
ANTIBIOTICS in AQUACULTURE
WAVMA: Quantification of antibiotics in aquaculture. To provide hard evidence from accurate and reliable sources about the use of antibiotics in aquaculture around the world.
FVS: A proposal from India to allow fisheries scientists to prescribe antibiotics due to perceived lack of fish vets.
AVMA AqVMC: Discussions on paucity of antibiotics licensed for aquatic animal use. Only 3 licensed in US.
EDUCATION and TRAINING
WAVMA: Education of vets in Aquatic Veterinary topics and the development of a Certificate in Aquatic veterinary practice (Cert AqV)
FVS: A new vet school in Hong Kong being established specialising in aquaculture.
AVMA AqVMC: Discussions on the conundrum of too few fish vets for the industry versus the view that there are no jobs for fish vets.
SPECIFIC DISEASE CHALLENGES:
MEVEA: Rickettsia and its effects on production dynamics; Parasites specifically Caligus spp.
FVS: Sea Lice: Amoebic Gill Disease

Lydia Brown MBE FRCVS
WAVMA Representative to the IAVC
drlydiabrown@gmail.com

COMMITTEE REPORTS

Membership Committee

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

New Members (January-February, 2015):

Full Members (Veterinarians)

Alisa Newton
Amanda Borchardt
Brian Joseph
E.M. Smith
Elizabeth Bamberger
Erica MacKinnon
Howard K-H Wong
Jeffrey Hoffman
Leighanne Hawkins
Michael Chia
Ronit Cossios
Sandra Fazakas
Steven Burns
Susan Gibson-Kueh
Tim Barbe

New Graduate Veterinarians

Chee Weiqin
Lindsay Thomas
Mai Mundeling
Naomi North
Trista Welsh

Student Members

Alissa Mones
Anirilys Solivan Diaz
Azureen Erdman
Bijan Shoaibiomrani
Blair Hamacher
Brittany Bogus
Carl Spielvogel
Caroline Brown
Catherine Wyre
Christy Cox
Friederike Pohlin
Jacqueline Elliott
Jade Fisher
Jennifer Engelhard
Jennifer Lucas
Kaitlyn Krizmanich
Kurt Arden
Meghan Baker
Melissa Cuerda Sanchez
Mykolas Kamaitis
Nathaniel Kapaldo
Sharon Liu
Sophie Goodall
Staci Spears
Traci Davis
Tricia Spooner

Meetings Committee

We begin the new year with a group of our members, including several members of the Executive Board, traveling to Asia to present aquatic medicine lectures as part of our co-sponsoring lectures at the World Small Animal Veterinary Association Congress, to be held May 15-18, 2015 in Bangkok, Thailand. Since this will be our debut in creating an aquatic program for WSAVA, we have arranged a Meet and Greet dinner evening for the members of the WSAVA Executive Board and Assembly. This will be held on Thurs. May 14, 2015 at Ban Khun Mae Restaurant, 458/6-9 Siam Square Soi 8, Rama 1 Road, Patumwan District, Bangkok 10330 Tel. (662)250-1952-3, (662)658-4112-3. The evening will begin with traditional Thai mixed drinks, followed by several courses of exotic Thai cuisine. We will be treated to traditional Thai music throughout the evening. Complimentary attendance is available to all full and student WAVMA members, so if you are planning to attend, please let me know so I can add you to the list.

As to the rest of the meetings schedule for 2015, our WAVMA president is currently in the process of exploring several interesting possibilities for additional meetings plus our Annual General Meeting and I will have more information available in the next edition of *The Aquatic Veterinarian.*

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

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

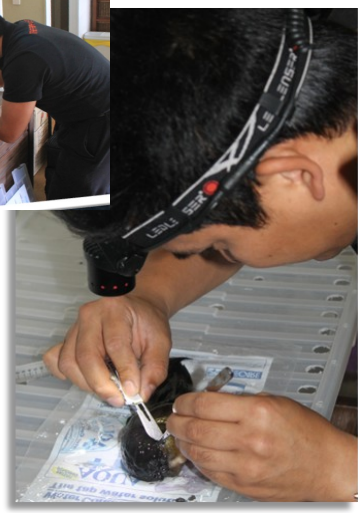
WAVMA Student Chapter Report:
Murdoch University—Semester Two 2014 Report

Introduction:

The second semester for the Murdoch University WAVMA Student Chapter was a quiet one. I have discovered it is quite tricky to coordinate a common time for WAVMA events between five year levels of vet students and demonstrators. However, we did manage to hold a fish necropsy workshop and attend a gold fish wen trimming!!

Fish Necropsy Workshop:

On Tuesday August 12th, we ran a fish necropsy workshop for veterinary students. This workshop was open for all year levels to attend and we had a total of 22 participants. We were fortunate to have Dr Susan Kueh and Dr Jo Bannister demonstrate for us the correct techniques for fish necropsy and discussed the anatomical variations between species. Dr Bannister showed us how to correctly dissect the fish whilst preserving organ integrity. Dr Kueh then demonstrated how to anaesthetise and collect blood samples from live fish. This workshop was very well received, with all students being so enthusiastic that we were still in the anatomy labs late into the night. We are hoping to hold additional workshops, such as fish histopathology in the near future.

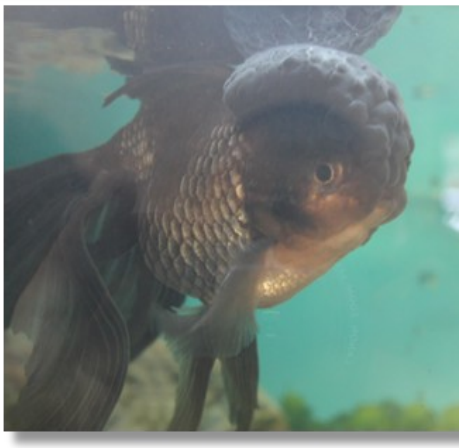


Home visit:
Goldfish Wen Trim

On Saturday 23rd August we were lucky enough to be invited to shadow none other than the 2014 WAVMA President, Dr Richmond Loh himself! We made a home visit to a client whose goldfish's overgrown wen was beginning to cover his eyes. Using a light sedation, Dr Richmond Loh was able to trim back the wen using a scalpel blade and a flunixin injection was given. We had the opportunity to take skin and gill biopsies from the tank mates to ensure that there were no nasty parasitic surprises. As you can see from the before and after photos, the treatment was a success. I am sure the goldfish will be much happier with clearer vision.

Before Wen Trim (left)

After Wen Trim (below)



I learnt a lot in these sessions and can't wait to see what next year will bring.

Hui Nee Chin
WAVMA Student Chapter
Founder & President

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)
Ross University (Pending)

*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).

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 aquatic veterinary 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

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

Eric Littman – Tufts University,
Cummings School of Veterinary Medicine,
Class of 2017

To my knowledge, very few US veterinary schools have incorporated aquatic animal health into the general vet school curriculum, despite being one of the few fields that has branches in almost all aspects of the field of veterinary medicine. The WAVMA/AVMF/AVMA Aquatic Veterinary Education Grant gave students the opportunity to either take specialized coursework or conduct research in the field of aquatic medicine. Thanks to the grant, I was one of the lucky students who received funding to pursue further education in aquatic medicine.

I was initially concerned that I would only be able to pursue my interests in aquatic animal medicine during the summer months, participating in programs such as AQUAVET and MarVet. Though these summer courses are invaluable for those who wish to join the field of aquatic animal medicine, for many, the next opportunity would be 11 months away. This grant offered me the chance to continue my aquatic animal health education during the school year, something which I did not think was financially (or even physically) possible.

The University of Florida's College of Veterinary Medicine is one of the few US vet schools that actually has an Aquatic Animal Health certificate program. This alone wouldn't do me too much good, except for the fact that they also participate in an active distance learning program. This means that every semester they offer one course in aquatic animal health to those of us who cannot physically attend their institution (and two courses in the summer months).

Eric hard at work listening to a lecture on aquatic animal conservation from 1000+ miles away!

Thanks to the grant, I was able to take two online courses through the UF CVM's Aquatic Animal Health distance learning program. The fall course was titled "Aquatic Animal Conservation Issues" and included a host of topics ranging from (among many others) coral reef health, aquatic pathology and toxicology and diseases and impacts of the aquaculture industry.

The spring course (which I am now currently taking) is titled "Fish and Aquatic Invertebrate Histology". Both of these courses span the semester (roughly twelve to sixteen weeks) and offer one to three hours of lecture per week.

Despite being enrolled in a full curriculum of veterinary courses, this online, extra course per semester has not been overly stressful. In fact, it is refreshing to be able to apply my knowledge to something I am interested in during the school year. I hear several of my classmates, who are interested in small or large animal medicine, complain that they shouldn't have to learn about the other, as they don't plan on having to use that knowledge. Students of aquatic animal medicine know this burden. This grant offered me the opportunity to build a foundation of aquatic animal health knowledge that many (in the US, at least) can only achieve outside of veterinary school.

SCHOLARSHIP COMMITTEE:
2014 WAVMA/AVMF/AVMA Aquatic Veterinary Education Grant Recipient Report

Justin Stilwell — University of Florida,
College of Veterinary Medicine.
Class of 2016

The first time I went to the UF Tropical Aquaculture Lab, I was there for the first week of the Diseases of Warmwater Fish course as an incoming freshman veterinary student. Nearly two years later I would get to return to spend a month working with Debbie Pouder and Dr. Roy Yanong in the heart of the state's ornamental aquaculture industry. While there, I played an active role of each day's activities including taking histories from clients, running water quality tests, performing necropsies on a variety of ornamental and food fish species, bacteriology, and histopathology. It was my first exposure to interacting and visiting with members of the ornamental aquaculture industry.

Touring many farms with Carlos Martinez and shadowing Dr. Johnny Shelley at 5D Tropical Inc. were also fantastic and memorable learning experiences. As with any veterinary teaching facility, Debbie, Roy, and Dr. Kathleen Hartman of USDA-APHIS held board rounds for the externs so that they made sure we were learning not only the medicine and pathogens, but also important aquaculture husbandry techniques and systems that can lead to disease if not managed properly. The experience I came away with was truly invaluable and I highly recommend it to any aspiring aquaculture veterinarian or veterinary student.

For the first time in my veterinary career, I was able to attend and present at the Eastern Fish Health Workshop, a conference dedicated to all things fish health. It's a welcoming forum for veterinarians and non-veterinary fish health professionals alike that comes together every year like a family reunion you actually want to go to.

This year was the 40th incarnation of this conference in Charleston, SC and I was there to present on my research regarding the discovery and genome sequencing of a novel Hepatitis E virus in salmonids. The presentation was well received and I gained some positive feedback about the importance of this discovery and future next steps. Beyond that, I was able to reconnect with folks I hadn't seen in several years and meet so many new people, who until then I had only heard stories of the work they were doing. We also had a behind the scenes tour and banquet at the South Carolina Aquarium with Dr. Shane Boylan, which was the icing on the cake of a great week at the Eastern Fish Health Workshop.

Justin Stilwell with Dr Tom Waltzek and Dr Pedro Henrique Viadanna at the Eastern Fish Health Workshop in Charleston, South Carolina

Finally I would like to thank the American Veterinary Medical Association, American Veterinary Medical Foundation, and the World Aquatic Veterinary Medical Association for providing the Aquatic Veterinary Education Grant that allowed me to participate in these wonderful experiences. I hope to continue expanding my knowledge of fish medicine and disease during the rest of my schooling and continue to contribute to the field in a meaningful way.

WAVMA is on Facebook!

Find us on Facebook

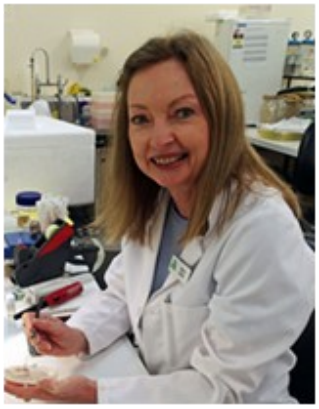
Assisted by the WAVMA Student Committee, aquatic veterinary medicine is being actively promoted on Facebook.

Become a WAVMA "friend" and feel free to post information useful for other veterinarians and veterinary students, and inform the public about what aquatic veterinarians do.

Search for WAVMA at www.facebook.com.

WAVMA CEPD Webinars

20th March 2015 1.00pm GMT
B-1009 Fish bacteriology: How it differs from human and terrestrial microbiology
Speaker: Dr. Nicky Buller



Description

This presentation will cover culture techniques and identification of bacteria from fish and other aquatic animals. Topics covered include collection of samples, collection and transport with an emphasis for remote areas; culture requirements for bacteria from freshwater, brackish and marine sources including use of NaCl, sea salts and incubation temperature; the advantages and disadvantages of different bacterial identification systems including conventional biochemical identification methods, use of the API systems and Vitek from Biomerieux, Biolog, and MALDI-TOF (matrix-assisted laser desorption ionisation time of flight mass spectrometry. Molecular techniques for identification of particular bacteria will be discussed briefly.

Learning Objectives

Collection and transport of samples
Culture techniques
Identification methods

Speaker Biography

Dr Buller is senior microbiologist at Animal Health Laboratories, Department of Agriculture and Food Western Australia where she has worked for over 20 years. Prior to this she worked in medical laboratories.

She has a post-graduate qualification in molecular biology, a PhD involving molecular typing techniques, and is the author of Bacteria and Fungi from Fish and Other Aquatic Animals; a practical identification manual. Samples received at AHL include those from aquatic and terrestrial sources.

10th April 2015 2.00pm GMT
B-1010 Water Quality 101 for fish veterinarians
Speaker: Dr. Richmond Loh

Description

Fishes live in intimate contact with their watery environment. Moreover, they rely on the qualities of water for many biological processes including respiration, nutrition, hydration, excretion and more. It is no wonder then that all persons dealing with aquatic animal health always stress on the importance of water quality. Water testing can help you quickly identify issues with water if it is the case. It will also allow us to modify their course of action or treatment plan.

This presentation gives an overview of each water parameter as it applies to fish health, and practical ways to correct water quality problems. It will cover the following topics: nitrogen cycle, temperature, ammonia, nitrite, nitrate, pH, carbonate hardness, general hardness, dissolved oxygen, carbon dioxide and salinity.

Learning Objectives

Understand the various water parameters and how they relate to the requirements of different fish species: temperature, salinity, pH, KH, GH, ammonia, nitrite, nitrate (the nitrogen cycle), dissolved oxygen and carbon dioxide.

Understand how to manage and prevent water quality issues using physical & biological filters, aeration, water flow, aquatic plants, water exchanges, fish stocking density, feeding rates, etc.

Understand how to generate results for the various parameters.

Speaker Biography

Dr Loh started his professional career as a veterinary fish pathologist in Tasmania. His skill set is unique, having been admitted as a Member of the Australian & New Zealand College of Veterinary Scientists (ANZCVS) by examination in the subjects of "AquaAnimal Health" and in "Pathobiology", and is a Certified Aquatic Veterinarian. As "The Fish Vet", he provides veterinary services to a range of clients: pet fish owners, public aquaria, retailers, wholesalers and fish farmers (ornamental and food fish). He has published 2 books: "Fish Vetting Essentials" & "Fish Vetting Medicines"; and an instructional DVD, "Fish Vetting Techniques & Practical Tips". He is an invited speaker nationally and internationally. He has served as President of the WAVMA in 2014.

May 2014
B-1011 Goldfish environmental enrichment and welfare.
Speaker: Dr. Miriam Sullivan

Description

Findings from a PhD thesis around environmental enrichment in goldfish using a fish preference approach for improving animal welfare.

Learning Objectives

TBD

Speaker Biography

Dr Miriam Sullivan, University of Western Australia.

June 2015

B-1012 Cuttlefish (Sepia) Diseases. Squid/ cuttlefish pathology. Description of *Vibrio alginolyticus* infection in cuttlefish with references to anatomy and histoanatomy

Speaker: Dr. Cheryl Sangster

Description

The presentation will introduce participants to the general anatomy and histoanatomy of the cuttlefish (Sepia spp.). Using this knowledge, we'll examine a case study of *Vibrio alginolyticus* infections in these animals and how the anatomy and physiology help explain the pathogenesis.

Learning Objectives

General understanding of basic cephalopod anatomy

Introduction to cephalopod histoanatomy

Common sites of infection by *Vibrio alginolyticus*

Speaker Biography

July 2015

B-1013 Koi Winter Diseases. Seasonal koi health

Speaker: Dr. Julius Tepper

Description

Many factors must be analyzed when doing a complete veterinary diagnostic workup for a pond problem. In areas where two distinct seasons are characterized by a warm metabolically active and cold metabolically inactive period, the diagnostic workup should account for these variable factors. This presentation will explore the variables seen during the cold season and the problems that often result from them.

Learning Objectives

1. To understand the dynamics of the physical and biological variables in koi ponds seen during cold weather.

To understand the negative effects these variables can have on koi health.

To learn what can be done to mitigate these negative effects.

Speaker Biography

Dr Tepper graduated with honors from the University of Liege in Brussels, Belgium in 1976, practicing as a small animal- exotic practitioner in New York ever since and opened the Long Island Fish Hospital in 1998 to care for the health of pet fish. He served as Treasurer of the International Association for Aquatic Animal Medicine from 2006- 09, and as a member of the Executive Board of the World Aquatic Veterinary Medical Association (WAVMA) since its formation in 2006 through 2012, and as President in 2011. He became a WAVMA Fellow in 2012 and a certified aquatic veterinarian (CertAqV) in 2013.

August 2015

B-1014 Diseases of Farmed Saltwater Crocodiles in Australia

Speaker: Dr. Cathy Shilton

Description

The presentation will provide a brief introduction to saltwater crocodile (*Crocodylus porosus*) farming in Australia followed by an overview of their diseases from a pathology perspective. The presentation may be of general interest as an overview to this industry, or of interest from the aquaculture perspective of mass rearing of a large reptile in captivity, or of interest to aquatic animal or reptile disease experts or pathologists. Pathology images will be limited to gross images (no histopathology).

Objectives

Gain familiarity with the crocodile farming industry in Australia

Gain familiarity with the diseases of farmed crocodiles

Speaker Biography

Dr Shilton started her career as a mixed practice veterinarian before going on to complete a residency specialising in zoo and wildlife medicine and pathology at the University of Guelph in Canada. For the past 13 years, she has worked as a veterinary pathologist for the Northern Territory Government in Australia, during which time she has seen hundreds of laboratory diagnostic submissions from the regional crocodile farms, as well having collaborated on numerous crocodile-related research projects. Dr Shilton is co-chair of the veterinary section of the International Union for the Conservation of Nature Crocodile Specialist Group.

18th September 2015 6.00pm GMT

B-1015 Vets in Fish Conservation. Aquatic Veterinarians and Fishery Conservation

Speaker: Prof. Mohamed Faisal

Description

In their hostile aquatic habitat, fish are subjected to a multitude of stressors. As a result, many fish species have extirpated or at the brink of extinction. Over the last three decades, bacterial and

viral pathogens have decimated fish populations throughout the world and the sight of miles-wide mats of dead fish became very common in marine and freshwater environments alike.
This presentation gives an overview of conservation medicine as an emerging discipline with an emphasis on the role played by aquatic veterinarians in rehabilitating wild fish stocks and managing fish health issues.

Learning Objectives

- Understand the discipline of Conservation Medicine
- Understand the role played by pathogens in causing serious fish kills.
- Understand the role played by aquatic veterinarians in saving fish species from extinction

Speaker Biography

Professor Faisal started his aquatic veterinary professional career in 1977, when his doctoral thesis at the Veterinary School of the University of Munich, Germany, focused on the Spring Viraemia of Carp Virus. Since then he practiced aquatic veterinary medicine in academia where he combined field observation, clinical examination, and laboratory studies harmoniously. His clinical experience included teleosts, mollusks, and amphipods. His research focused on understanding the host-pathogen intricacies. Currently, he directs the Aquatic Animal Medicine Program at Medicine, Michigan State University. He oversees all fish health issues for Michigan including fishery rehabilitation programs. He is proud to have served as WAVMA President in 2013.

5th October 2015
B-1016 Marine Ornamental Invertebrate Medicine
Speaker: Prof. Greg Lewbart

Description

Invertebrate animals comprise >95% of the animal kingdom's species, yet non-parasitic invertebrates are vastly underrepresented in the typical veterinary school curriculum. This lecture provides an introduction to some of the more prominent marine invertebrate groups (coelenterates, mollusks, crustaceans, echinoderms, and the horseshoe crab) and reviews the state of the science with regards to clinical techniques. Areas of emphasis include taxonomy, anatomy, physiology, anesthesia, diagnostic techniques, and clinical management.

Learning Objectives

- Describe the differences between the major marine invertebrate taxonomic groups.
- Describe how to work up a marine invertebrate case.
- Discuss the treatment and management options for the most common and important diseases and syndromes of captive marine invertebrates.

Speaker Biography

Greg received a B.A. in biology from Gettysburg College in 1981, an M.S. in biology with a concentration in marine biology from Northeastern University in 1985, and a V.M.D. from the University of Pennsylvania, School of Veterinary Medicine in 1988. He worked for a large wholesaler of ornamental fishes before joining the faculty at the North Carolina State University College of Veterinary Medicine in 1993, where he is Professor of Aquatic Animal Medicine. He's a diplomate of the American College of Zoological Medicine and was named 2007 Exotic DVM of the Year by ExoticDVM Magazine. In 2012 he received the William Medway Award for Excellence in Teaching from the International Association for Aquatic Animal Medicine.

Greg is an author on numerous popular and scientific articles about invertebrates, fishes, amphibians and reptiles and speaks locally, nationally and internationally on these subjects. He's also authored or co-authored over 20 book chapters related to veterinary medicine of the above-mentioned taxonomic groups and edited or co-edited three veterinary textbooks: Self-Assessment Colour Review of Ornamental Fish (Manson Publishing and ISU Press, 1998), Rapid Review of Exotic Animal Medicine and Husbandry (Manson Publishing, 2008), and the multiple award winning Invertebrate Medicine (Wiley-Blackwell Publishing, 2006; 2012).

19th November 2015
B-1017 Elasmobranch (Shark) Medicine
Speaker: Dr. Rob Jones

Description

Elasmobranchs are the cartilaginous fish – the sharks and rays. They are commonly kept in public aquariums and the public have a fascination with them. They have significant differences from an anatomical viewpoint as well as physiologically - these basic differences will be covered.

I will also discuss some of the artificial reproduction research I have been involved with for the past 10 years. Finally, I will discuss some common problems seen in elasmobranchs in captivity as well as some of the wild shark rescues I have been involved with.

Learning Objectives

Understand elasmobranch anatomy and how it differs from teleosts
Understand elasmobranch physiology and reproduction and how it differs from teleosts
Examine some shark medicine cases and treatments

Speaker Biography

Since 1999, I have been working within the aquarium world. I now travel and consult to all the public aquariums in Australia and New Zealand and more recently internationally.

Commencing in 2003, I organized a research team working on artificial reproduction in sharks, which culminated in the first Artficial Insemination shark born in March 2014.

I also have developed the world's first online course for aquarists and others working in the aquarium and zoo industry (the e-quarist course) was launched in May 2011 and now has students on five continents.

December 2015
B-1018 Fish Leukocytes
Speaker: Prof. Dušan Palić

Description

Leukogram is one of most common tools used during clinical evaluation of a patient. This would be true for the fishes as well, however, available information is scattered through scientific journals and some clinical textbooks, and focuses on just a few out of more than 35,000 fish species. Further, many instruments that are routinely used in blood cell analysis do not work well, or at all, with fish blood for multiple reasons such as presence of nucleated red blood cells. Because of this, it is important for a clinician who wants to practice on (especially ornamental or pet) fishes, to learn how to distinguish the leukocytes in fish blood smears. This presentation on fish leukocytes will provide a practicing aquatic veterinarian with information how to take advantage of blood smears to collect more information about health status of fish.

Learning Objectives

Veterinarian will understand the value and limitations of the fish blood smear.
Veterinarian will become familiar with major leukocyte types in fish.
Veterinarian will be able to prepare tools for collection and use rapid staining techniques to produce a readable fish blood smear.

Speaker Biography

Prof. Palić is a third generation veterinary professor, who fell in an aquarium when he was two years old. He has his life focused on aquatic animal veterinary medicine since. Dušan has been involved in teaching, research and extension/practice in fish for over 20 years, and has participated in number of initiatives to enhance veterinary workforce in the area of aquatics. He is a founding WAVMA member, fellow and past president, and also a Cert AqV. Dušan also is a founding diplomate of European College of Aquatic Animal Health (ECAAH). He participated in development of USDA NVAP (veterinary accreditation program) aquatic modules. He served on multiple committees, including World Veterinary Association Communication work group, and has organized many events.

Model of Great White Shark in Balboa Park Museum, San Diego, California. Photographed by Nick Saint-Erne

Meet Dr Timothy Mullican, DVM

When did you first become interested in Aquatic Veterinary Medicine?

"As a college student at the University of Dayton, I was working part time at a small animal clinic. One of the clinicians, knowing I was also interested in marine biology, came in one day and gave me article from JAVMA about the *AquaVet* Program at Woods Hole. I said to myself 'If I ever get into veterinary school, I'm going to do this.' Three years later my dream came true."

Dr. Mullican graduated from the University of Dayton with a B.S. in biology and continued his education at Purdue University, where he received his Doctor of Veterinary Medicine degree. He credits the AquaVet program at the Marine Biological Laboratory in Woods Hole, Massachusetts with providing the basis of his aquatic animal career, which began in 1997.

Who were your inspirations in Aquatic Medicine?

"Dr. Larry Dunn was a guest lecturer at Purdue when I was sophomore in veterinary school. He was a captivating speaker who further fired my interest into Aquatic Veterinary Medicine. Drs. Don Abt, Greg Lewbart and Ruth Francis-Floyd also provided meaningful learning opportunities early in my career."

Initially hired as consulting veterinarian at Newport Aquarium in Newport, Kentucky in 1997, he rose to the position of Executive Director in 2002, a role he held until 2005. He then worked as an independent consultant for both private and non-profit institutions, including Colliers International, the lead developer on a project that included the Puerto Rico National Aquarium, which was canceled due to funding concerns.

Arriving at Georgia Aquarium in 2008, he has held a variety of positions in the past 7 years. Initially hired as Director of Veterinary Services in early 2008, he moved over to Zoological Operations later that year. His research interest is giant manta rays and he also holds the position of Adjunct Professor at University of Georgia's College of Veterinary Medicine.

As the Aquarium's Chief Zoological Officer, Dr. Mullican oversees the daily operations of all animal husbandry and animal training departments, as well as Life Support Engineering, the Water Quality Lab, Animal Commissary and Dive Operations.

The clinical veterinary services are managed by Dr. Gregory D. Bossart, V.M.D., Ph.D. Senior Vice President, Animal Health, Research and Conservation and Dr. Tonya Clauss DVM, MS, Director, Animal Health. The Associate Clinical Veterinarians include Alexa McDermott, DVM and Chelsea E. Anderson, DVM.

The Georgia Aquarium
225 Baker Street NW
Atlanta, GA 30313 USA
Phone: 404.581.4000
http://www.georgiaaquarium.org/

The Georgia Aquarium in Atlanta, Georgia, houses thousands of aquatic animals, representing over 500 species, in over 10 million US gallons (38,000 m^3) of marine and fresh water exhibits, and was the world's largest aquarium when it opened in 2005. Georgia Aquarium benefactor Bernard Marcus credits his 60th birthday dinner, held at the Monterey Bay Aquarium, with inspiring him to build a great aquarium for Atlanta; his subsequent $250 million donation provided the bulk of the money needed to build and stock the new facility. The Aquarium's notable specimens include whale sharks, beluga whales, bottlenose dolphins, manta rays and African penguins.

The Georgia Aquarium is the only institution outside of Asia housing whale sharks, which live in the 6.3-million-gallon (24,000 m^3) Ocean Voyager exhibit. Their importation from Taiwan (by air, truck and boat) had never been attempted previously. They were taken from Taiwan's annual fishing kill quota, under which they would have been eaten had they not been purchased by the aquarium.

Domino the Whale Shark and Dr Tim Mullican, Senior Vice President & Chief Zoological Officer

Whale Shark in the Ocean Voyager exhibit

The aquarium's animals are displayed in six galleries: Georgia Explorer, Tropical Diver (featuring mainly Indo-Pacific tropical fish); Ocean Voyager, which contains 6.3 million US gallons (24,000 m^3) of water; measures 284 ft × 126 ft (87 m × 38 m) and

Ray overhead in The Ocean Voyager exhibit tunnel

the depth ranges between 20 and 30 ft (6.1 and 9.1 m), making it the largest indoor aquatic habitat in the world, featuring the life of the Mesoamerican Barrier Reef System and showcasing the aquarium's whale sharks, as well as a 100 ft (30 m) underwater tunnel and one of the world's largest viewing windows; Cold Water Quest; River Scout, featuring an overhead river where visitors can see North American fish from the bottom up, as well as other unusual freshwater life from around the world, such as piranhas and archer fish; and Dolphin Tales, which houses the indoor dolphin stadium.

In 2006, A.D. "Pete" Correll, retired Chairman and CEO of Georgia-Pacific, and his wife, Ada Lee, helped ensure the success of Georgia Aquarium's aquatic animal medicine and aquatic conservation programs by giving a gift to name The Correll Center for Aquatic Animal Health. Pete Correll is a member of the Aquarium's Board of Advisors. The Corrells are particularly gratified by the unique opportunities that the Correll Center will offer UGA Veterinary students and faculty in both research and teaching.

A major goal of Georgia Aquarium is to be the leading facility for aquatic animal conservation and research. The state-of-the-art animal health facility, research and conservation activities, and the partnership with the University of Georgia Veterinary School are part of the programs hosted through the Correll Center for Aquatic Animal Health. The partnership with UGA allows the Aquarium to provide a complete aquatic animal pathology and clinical medicine program while training veterinary residents, interns, and externs.

In addition to Dr. Mullican, there are four veterinarians on the clinical staff. They are:

Gregory D. Bossart, V.M.D., Ph.D.
Diplomate, European College of Zoological Medicine (Wildlife Population Health)
Diplomate, American College of Veterinary Pathologists (Hon.)
Senior Vice President
Animal Health, Research and Conservation

Tonya Clauss DVM, MS
Director, Animal Health

Alexa McDermott, DVM
Associate Veterinarian

Chelsea E. Anderson, DVM
Associate Veterinarian

Centrally located within the Aquarium building, the Correll Center's 10,500 square foot space incorporates a surgery suite with scrub room, pathology room, medical records room with technician office space, water quality lab, diagnostic lab and treatment space.

Surgery Room

Sign in the hospital listing the Veterinarians involved in designing the facilities in the Correll Center for Aquatic Animal Health. Hospital and Treatment area

The space was designed by world-class veterinary professionals and conservation organizations. Special features of the Correll Center space include digital radiography, digital ultrasound, digital endoscopy/laparoscopy, gas and water-borne anesthesia systems, steam and gas instrument sterilization, compound and stereo microscopes with digital cameras and a digital medical records system. The Correll Center for Aquatic Animal Health can be viewed on behind-the-scenes tours at Georgia Aquarium. Georgia Aquarium is a 501(c)3 organization, and we rely on community support to fund our special programs including veterinary services.

Quarantine and Hospital tanks in the Treatment Room

Use your smart phone to scan the QR code (left) to see the Gallery of Animals in the Georgia Aquarium.

South American Discus

Kelp bed

Rainbowfish

African Cichlids

Asian fish exhibit

Amazon exhibit with piranhas

Beluga Whales

Quarantine tanks in the Treatment Room

Quarantine tank with a Lionfish

Young visitors at Georgia Aquarium admiring the view into the Ocean Voyager

Photos of the Georgia Aquarium taken by Nick Saint, Erne, DVM, CertAqV

Information about the Georgia Aquarium was edited from material in the following websites:
http://en.wikipedia.org/wiki/Georgia_Aquarium

http://www.georgiaaquarium.org/conserve/research/veterinary-research

AUTHOR'S INSTRUCTIONS

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.

Advertising

See advertising rates on page 52.

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.

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.

A causal agent of a new disease "Virus Y" in Norwegian rainbow trout is not yet identified

By Brit Hjeltnes,
Norwegian Veterinary Institute,
Veterinærinstituttet, Bergen, Norway

In late August 2013 the Norwegian Veterinary Institute (NVI) received the first case of diseased rainbow trout from a hatchery. The signs of disease were unusual for fish at this age. The second and third cases were submitted to the NVI during October and November. The most recent hatchery affected by this disease was recorded in January 2014. Diseased fish were sized from 30–100 g. One hatchery reported high mortality in some pens. The other affected sites reported moderate mortalities.

Diseased fish were exposed to freshwater or water with low salinity (< 1‰). Fish from hatcheries affected by the disease were transferred to seawater. In one case high mortality after seawater transfer was reported, but the mortality ceased after a short period. Two farms have experienced disease two to three months after sea transfer. In other cases no specific problems in sea water have been recorded.

The fish farmers involved have from a preventive perspective and after having consulted the Norwegian Food Safety Authority (NFSA), carried out measures to mitigate the risk of spreading the disease.

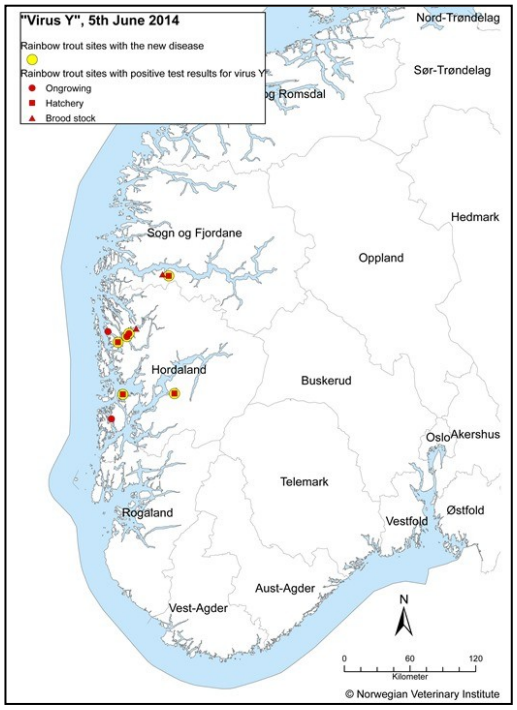
Sick fish show signs of circulatory failure and may have pale viscera due to anaemia. Ascites may also be observed. Histopathological findings are inflammation in heart and red muscle tissue and cellular necrosis in the liver.

Tissue from diseased fish has been analysed by PCR for the following fish pathogenic virus: Viral haemorrhagic septicaemia virus (VHS), infectious salmon anaemia virus (ISA), pancreas disease virus (SAV) and piscine orthoreovirus (PRV). None of these agents were detected. Infectious pancreatic virus (IPNV) was detected in small amounts in fish from one of the farms.

Virus cultivation in conventional cell lines has so far not succeeded; however, further work on that issue is being completed. Extended virus cultivation is also being carried out. Pathogenic fish bacteria were not detected, and antibiotic treatment carried out in one case, had no effect.

Sequences from a virus ("virus Y") have been detected in material from diseased fish. The virus was detected in blood and may be associated with the disease. Sequences from the virus are used to establish a PCR method for detection of virus Y.

The NVI has conducted a pilot infection trial aiming to confirm that the disease is transmissible. So far it has not been confirmed that virus Y is the causal agent of this disease. However, results showed that the amount of virus Y increased in the blood of rainbow trout injected with infected material, and that virus Y was transferred to cohabitants through the water. Clinical symptoms and mortality were not observed during the trial, but histopathological findings indicated that the disease was transferred.



The infection trial showed that the amount of virus Y also increased in the blood of Atlantic salmon injected with infected material, however, slower compared to rainbow trout. No current information indicates that neither virus Y nor the new disease is transmissible to Atlantic salmon.

It is now documented that virus Y survives in the blood of rainbow trout, but more research is needed to confirm that the virus is the causative agent of the new disease. The disease cannot be transmitted to humans.

Virus Y has been detected in hatcheries with diseased rainbow trout and in contact sites to these hatcheries, both in brood fish and seawater sites producing rainbow trout for human consumption. In addition virus Y has been detected in small quantities from randomly tested historical material from the counties of Hordaland and Møre & Romsdal back to 2011.

Actions taken by the Norwegian Veterinary Institute:

Informing the NFSA and the industry
Screening of selected fish populations for virus Y
Next generation sequencing is conducted to characterise virus Y, and for detection of other potential pathogenic agents
Electron microscopy
Establishing cell cultures for cultivation of virus Y
Extended examination of historical material
Investigate the possibility of vertical transmission of virus Y
Applications for funding of a large scale infection trial.

Skin lesions in Oblong Turtles
Dr Richmond Loh

A suburban lake in Western Australia was undergoing an exotic fish eradication program using rotenone. To prevent potential poisoning of native oblong turtles (*Chelodina oblonga*), over 40 individuals were collected from the lake. The oblong turtle is native to Western Australia and is listed as a Threatened species. Its shell is pale to dark brown or black and usually covered with algae, making it difficult to see in water. This turtle gets its name from the oblong shape of its shell, and can grow up to 40 cm in length.

The captured oblong turtles were temporarily held at a facility in concrete ponds that also contained two large carp. The water was clean and clear. Hiding areas and basking sites were provided for the turtles. However, the turtles developed skin lesions within the first 2 weeks in captivity.

Skin scrapes from lesions were submitted for cytological examination. Two skin scrapes contained inflammatory cells with myriad bacteria. Bacterial skin infections are common in aquatic animals and can lead to dermatosepticaemia if superficial wounds are not addressed quickly. In turtles, it is termed SCUD (septicaemic cutaneous ulcerative dermatitis). The underlying reason for this is commonly due to the lack of basking by the turtle and fouled water.

Two skin scrapes had large numbers of ciliated protozoa. The ciliated protozoa resembled *Chilodonella* because they appeared to have parallel rows of cilia on their bodies. However, the identity of these and whether they are true pathogens of the turtles is dubious. They are likely to be commensals or opportunists, since it would be expected that the protozoa might not survive desiccation when turtles bask. *Chilodonella* are primary pathogens of fish, and it is thought that they may have come from the cohabitating carp.

One skin scrape had filamentous structures with green pigmentation that resembled algae. Algae can induce a granulomatous dermatitis in turtles. It was suggested that if there was clinical evidence of this, the lesions should be debrided and topical disinfectant applied.

Water testing was done and the pH was found to be too alkaline (pH of 8.5, with the ideal range being 7.0-7.6). This is likely related to the concrete pond material. Alkaline water might have exacerbated the skin conditions.

The consequences of ulcerative skin lesions in aquatic animals are major because the skin not only acts as a barrier against pathogens, but also limits significant shifts of hydromineral (osmotic) balance. Correction of underlying problems (encourage basking), together with topical and systemic antibiotics (modified based on antibiotic sensitivity) may be necessary.

It was considered that the temporary holding facilities were inadequate for the turtles. The concrete ponds were too hard and abrasive and these impacted on the turtles' foot pads and the corners of their plastron. The turtles need to bask, and although basking sites were available, they were too exposed to be used regularly by the turtles. The water was also too clear; they prefer dark, tannin-stained water and a muddy substrate. These, combined with the stress of translocating to unfamiliar surroundings exacerbated their condition. With the large number of individuals involved, and the mild disease presentation, it was decided that the turtles be released into their natural environment as soon as possible (rather than hospitalisation for treatment). They were released the following week.

Some 3 weeks later (late autumn), 13 turtles were recaptured and found to be in excellent condition. Most of the turtles had gained weight (the turtles were micro-chipped when first trapped, enabling us to monitor individuals), with a few minor (<5%) weight losses. Other organisms trapped included *Gambusia* fish, water boatmen, dragonfly larvae, but no invasive catfish that were trying to be eliminated from the pond (when Fisheries have three consecutive trappings without catfish it will be assumed that they have been eradicated). It was reassuring to see that there were adequate food sources available for the turtles.

Credits to: *Turtle Oblonga Rescue and Rehabilitation Network, and the Western Australia Dept of Agriculture and Food.*

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

Puffer Teeth Trimming

I have a client with a home aquarium (120 gallons containing 8 fish). The tank is serviced by a maintenance company weekly, so the owner cannot give me water quality parameters. There is a black spotted puffer fish that has not eaten in 4 days. Diet has been "shrimp shaker" (whatever that is?) every day.

I assumed the problem would be overgrown teeth, from what I had read about puffers on VIN, Exotic DVM, and online. But none of the articles or discussions really tells you what a normal length of teeth look like. The teeth were symmetrical and 1-1.5 cm from maxilla to tip of teeth in central maxillary portion. The mandibular teeth were much smaller. I trimmed them with a Dremel (difficult - took a long time to get much off, and was using MS-222). Not sure I trimmed enough, but the procedure was taking so long that I figured I could return and do it again if necessary.

The puffer did puff up when initially netted, and puffed again when placed back into its tank. We are wondering what the risk is of this fish emitting tetrodotoxin into the water and killing its tank mates? It is still not eating, the day after the trim (but did deflate).

I think radiographs would also be nice, as I'd seen stones reported in puffers. Though I could not palpate anything abnormal in this fish's coelom. Skin looks normal, and no flashing or other behaviors (though didn't do any skin scrapes or gill/fin snips).

Ideas? I don't want the owner to euthanize this fish.

Cindy Fulton, BVMS
VCA Animal Medical Center
Portsmouth, NH, USA
psittacine@all-animals.net

The key with puffer teeth is symmetry. If the teeth are symmetrical and meet, I often times won't trim them. I think many times people trim the dental plates in puffers just like they do in rabbits and guinea pigs, where malocclusion is not necessarily the actual problem, though it may be in this case.

Anorexia is a general clinical sign in my mind, I have to be concerned about other issues with this puffer, including kidney or liver issues and bacterial infection, GI obstruction, etc.

Radiographs are fairly easy to take, especially survey films for stones. Just place the fish in a bag of water and shoot the film with a comparable abdominal technique (obviously this will vary some based on individual radiograph machine).

I did have one of my own personal puffers "nuke" a tank after getting sucked into a powerhead. I do not know if it was tetrodotoxin that killed that tank (and every fish in it) but that was my assumption.

You can net and handle them without too much stress to the individual animal. I wouldn't expect them to eat the day after a trim, just because of stress on the fish, although I have seen some eat and some not the day after trimming them.

Jack Kottwitz, DVM
PhD student: Clinical Pharmacology
Affiliate Associate Professor:
Zoo and Wildlife Medicine
College of Veterinary Medicine
Auburn University.
jack_kottwitz@hotmail.com

I'd agree symmetry and teeth meet is the key. As I come from a generation of vets where we flung steroids around (probably clinically bad but made the patient feel good) I always followed any teeth trim with an IM dose of dexafort. Never knew whether it was the teeth trim or the steroids but they always ate.

On the subject of stones - I normally tell the client to wait three days as they normally regurgitate during this period.

Regards,

Chris Walster BVMS MVPH CertAqV MRCVS
The Island Veterinary Associates Ltd
132 Lichfield Road
Stafford, UK
chris.walster@onlinevets.co.uk

In addition to pufferfish (Tetraodontiformes), Tetrodotoxin (TTX) has been isolated from widely differing animal species, including newts of the genus *Taricha*, toads of the genus *Atelopus*, several blue-ringed octopuses of the genus *Hapalochlaena*, several seastars, certain marine angelfish, a polyclad flatworm, several species of Chaetognatha (arrow worms), nemerteans (ribbonworms) and several species of xanthid crabs.

The toxin is produced by bacteria within blue-ringed octopuses. The most common bacteria associated with TTX production are *Vibrio* bacteria, with *Vibrio alginolyticus* being the most common species. Pufferfish, chaetognaths, and nemerteans have been shown to contain *Vibrio alginolyticus* and TTX. The link between these bacteria and production of TTX in animals has not been firmly established, and there remains much debate in the literature as to whether the bacteria are truly the source of TTX in animals.

From:
https://en.wikipedia.org/wiki/Tetrodotoxin

Egg Bound Koi

Hi WAVMA,

I've this koi (*Cyprinus carpio*) that's egg-bound. No response to 0.5ml/Kg Ovaprim. Water temperature has been 23-25 deg C (73-77 F) for a couple of months. The fish in this pond have never bred for years. Welcome your advice?

Dr **Richmond Loh**
DipProjMgt, BSc, BVMS, MPhil (Pathology) Murdoch, MANZCVS (Aquatics& Pathobiology), CertAqV, CMAVA, NATA Signatory.
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Time for surgery

Mike Corcoran, DVM, CertAqV
vulcanveterinary@gmail.com

I totally agree. I would probably suggest surgery at this point.

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World Aquatic Veterinary Medical Association
Director-at-Large

Agreed. Cut for the cure...

Adolf Maas
DrMaas@zoovet.us

Likely at this point since the fish has not bred for years, in my experience, is that the fish has an ovarian sarcoma. Ovaprim will not have any effect on that. It may need to be surgically removed, and a radiograph would help identify a dense mass is present if it were a tumor. Often it will push the intestines ventrally and the chambers of the gas bladder cranially, which can be seen on radiograph. Using barium administered orally with a feeding tube will help visualize the intestinal tract on radiographs.

I have also seen abnormally enlarged gas bladders cause abdominal swelling, and the difference between the gas bladder and a mass in the abdomen will be easy to discern on a radiograph.

As Adolph succinctly surmised the surgeons' creed: "A chance to cut is a chance to cure!"

Nick Saint-Erne, DVM CertAqV
nsainterne@ssg.petsmart.com

You could try metoclopramide twice with Ovaprim with a day interval. I've had pretty good results with metoclopramide and HCG, since I am not allowed to use Ovaprim in Belgium.

Section is the last option since the shock with such a lot of eggs could be fatal in my humble opinion

Greta Van De Sompel
johan.van.der.cruyssen@telenet.be

Suggested causes for the condition include: fish being too obese (fed diet too high in carbohydrates, fat builds up within the cavity and prevents healthy development of the eggs and ultimately their exit); "mongrel" koi; ovarian neoplasm; or out-of-season.

In this case, they had been feeding a low quality, high carb diet for years. They have only just in the last 1 year, moved to Hikari and Koi King Pro. So, perhaps the suggestion of a high carb diet may be true. They are also pet koi, and not bred from pure lines.

All suggested responses lead to action, because to leave her as she is might predispose her to septicaemia. This season, there've been several in the koi club report sudden deaths of gravid females.

For management/treatment of this case:
Most suggest surgical removal of ovaries, but this can be tricky because of the delicate ovarian membrane. One suggested using a product called Alizin (an anti-progesterone for aborting bitches from 0-45 days post-mating). Constituent = Algepristone 30 mg/ml & each vial contains 300 mg/10 ml. Dose for bitch is 10 mg/kg by injection twice, 24 hours apart. The product is marketed by Virbac. Another suggested practicing Ayurvedic medicine, and to feed female koi more fruits such as grape-fruit as a cleanser. And another suggested metoclopramide twice with ovaprim or hCG with a day interval.

Dr **Richmond Loh**

AQUATIC VETERINARY ABSTRACTS
Topic: Fish Vaccinations
Complied by Dr David Scarfe

Vaccines for fish in aquaculture

Sommerset I, B Krossøy, E Biering & P Fros (2005). *Expert Rev. Vaccines*, 4(1):89-101. (Open access publication available at http://aqua.merck-animal-health.com/binaries/105_104343_tcm127-122150.pdf.)

Abstract

Vaccination plays an important role in large-scale commercial fish farming and has been a key reason for the success of salmon cultivation. In addition to salmon and trout, commercial vaccines are available for channel catfish, European seabass and seabream, Japanese amberjack and yellowtail, tilapia and Atlantic cod. In general, empirically developed vaccines based on inactivated bacterial pathogens have proven to be very efficacious in fish.

Fewer commercially available viral vaccines and no parasite vaccines exist. Substantial efficacy data are available for new fish vaccines and advanced technology has been implemented. However, before such vaccines can be successfully commercialized, several hurdles have to be overcome regarding the production of cheap but effective antigens and adjuvants, while bearing in mind environmental and associated regulatory concerns (e.g., those that limit the use of live vaccines).

Pharmaceutical companies have performed a considerable amount of research on fish vaccines, however, limited information is available in scientific publications. In addition, salmonids dominate both the literature and commercial focus, despite their relatively small contribution to the total volume of farmed fish in the world. This review provides an overview of the fish vaccines that are currently commercially available and some viewpoints on how the field is likely to evolve in the near future.

Microbiologist Phillip Klesius gives catfish feed that has been supplemented with vaccine at the Aquatic Animal Health Research Unit in Auburn, Alabama.

Major bacterial diseases in aquaculture and their vaccine development

Pridgeon JW & PH Klesius (2012). *CAB Reviews*, 7 (048): 16 pg. (An open access publication available at http://tinyurl.com/fishvaccines.)

Abstract

Aquaculture is emerging as the fastest growing food-producing industry in the world because of the increasing demand for food fish consumption. However, the intensive culture of food fish has led to outbreaks of various bacterial diseases, resulting in annual economic losses to the aquaculture industry estimated at billions of dollars worldwide. Feeding infected fish with antibiotic-medicated food is a general practice but has led to antibiotic resistance development in bacterial pathogen, resulting in a higher dose requirement for effective control, a matter of increasing public concern. Therefore, alternatives to antibiotics that give similar or enhanced protection to aquatic animals are urgently needed. Various vaccines have been developed recently to combat bacterial diseases in aquaculture. The purpose of this review is to summarize the major bacterial pathogens in aquaculture and the development of vaccines as alternatives to antibiotics to protect aquatic animals from these bacterial diseases.

Biotechnology and DNA vaccines for aquatic animals
Kurath G. Rev Sci Tech. 2008 Apr;27(1):175-96.
http://www.ncbi.nlm.nih.gov/pubmed/18666487

Abstract

Biotechnology has been used extensively in the development of vaccines for aquaculture. Modern molecular methods such as polymerase chain reaction (PCR), cloning and microarray analysis have facilitated antigen discovery, construction of novel candidate vaccines, and assessments of vaccine efficacy, mode of action, and host response. This review focuses on DNA vaccines for finfish to illustrate biotechnology applications in this field. Although DNA vaccines for fish rhabdoviruses continue to show the highest efficacy, DNA vaccines for several other viral and bacterial fish pathogens have now been proven to provide significant protection against pathogen challenge. Studies of the fish rhabdovirus DNA vaccines have elucidated factors that affect DNA vaccine efficacy as well as the nature of the fish innate and adaptive immune responses to DNA vaccines. As tools for managing aquatic animal disease emergencies, DNA vaccines have advantages in speed, flexibility, and safety, and one fish DNA vaccine has been licensed.
PMID: 18666487 [PubMed - indexed for MEDLINE]

Construction and evaluation of a live vaccine against *Edwardsiella tarda* and *Vibrio harveyi*: Laboratory vs. mock field trial

Y-H Hu, S Cheng, M Zhang & L Sun (2011). *Vaccine*, 29(24): 4081-4085.

Abstract

Edwardsiella tarda and *Vibrio harveyi* are Gram-negative bacterial pathogens that affect a wide range of cultured fish. In previous studies, we have reported an *E. tarda* live vaccine ATCC15947 and a *V. harveyi* subunit vaccine DegQ. On the basis of these studies, in the present study we developed a cross protective vaccine against both *E. tarda* and *V. harveyi* by constructing a recombinant ATCC15947, Et15VhD, that expresses and secrets *V. harveyi* DegQ as a soluble antigen.

Laboratory studies in a turbot (*Scophthalmus maximus*) model showed that Et15VhD elicited significant protections against *E. tarda* and *V. harveyi* when administered via intraperitoneal injection, oral feeding, immersion, and oral plus immersion, respectively. Microbiological analysis indicated dissemination and transient colonization of Et15VhD in fish tissues following vaccination. Since, compared to injection, oral plus immersion is a practically more acceptable vaccination procedure in aquaculture, we conducted a mock field trial to further examine the potential of Et15VhD as an oral plus immersion vaccine.

The results showed that during the period before artificial bacterial challenge, mortality was observed in both the vaccinated group and the control group; however, the mortality of Et15VhD-vaccinated fish was significantly lower than that of the control fish. Following experimental challenge with *E. tarda* and *V. harveyi* at one and two months post-vaccination, Et15VhD -vaccinated fish exhibited dramatically increased survival rates compared to control fish. Serum antibody analysis indicated specific antibody production in Et15VhD-vaccinated fish. Taken together, these results demonstrate that Et15VhD induces strong protective immunity against *E. tarda* and *V. harveyi* under both laboratory and mock field conditions, which suggests a potential for Et15VhD to be used in aquaculture.

Development of a novobiocin-resistant *Edwardsiella ictaluri* as a novel vaccine in channel catfish (*Ictalurus punctatus*)

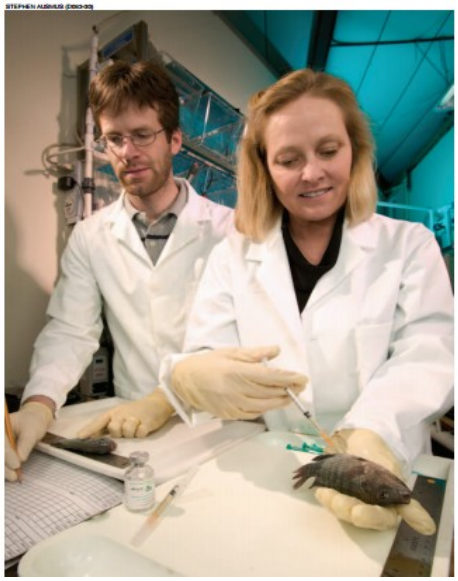
Pridgeon JW & PH Klesius (2011). *Vaccine*, 29 (34): 5631-5637.

Abstract

The efficacy of a novel attenuated *Edwardsiella ictaluri* vaccine (B-50348) was determined in channel catfish (*Ictalurus punctatus*) by bath immersion and intraperitoneal (IP) injection. The vaccine was developed from a virulent strain of *E. ictaluri* (AL93-58) through selection for novobiocin resistance.

When channel catfish (average weight 10 g) were IP injected with 4.2×10^6 colony-forming units (CFU) of the attenuated vaccine B-50348, no fish died. However, when the same age and size matched group of the catfish were IP injected with a lesser amount (2.4×10^6 CFU/fish) of modified live RE-33 vaccine or the AL93-58 virulent strain (2.5×10^6 CFU/fish) of *E. ictaluri*, 65% and 95% fish died, respectively. When channel catfish were challenged with AL93-58, relative percent survival values of vaccinated fish were all greater than 90% at 22, 32, and 63 days post B-50348 vaccination through intraperitoneal injection. By bath immersion, at 37 and 57 days post vaccination of B-50348, relative percent survival values were both 100% when fish were challenged by virulent *E. ictaluri* AL93-58.

Our results suggest that B-50348 could be used as a novel safe and efficacious vaccine against ESC in channel catfish



At the Aquatic Animal Health Research Unit's Chestertown, Maryland, site, veterinary medical officer Dr David Pasnik weighs and measures a tilapia fish while aquatic pathologist Joyce Evans injects another one with a vaccine.
Photos from: http://www.ars.usda.gov/is/ar/archive/may05/fish0505.pdf

Oral and Anal Vaccination Confers Full Protection against Enteric Redmouth Disease (ERM) in Rainbow Trout

Villumsen KR, et al. (2014). *PLoS ONE*, 9(4): 10 pp. (Open access publication accessible at: http://tinyurl.com/n3s9l35).

Abstract

The effect of oral vaccines against bacterial fish diseases has been a topic for debate for decades. Recently both M-like cells and dendritic cells have been discovered in the intestine of rainbow trout. It is therefore likely that antigens reaching the intestine can be taken up and thereby induce immunity in orally vaccinated fish. The objective of this project was to investigate whether oral and anal vaccination of rainbow trout induces protection against an experimental waterborne infection with the pathogenic enterobacteria *Yersinia ruckeri* O1 biotype 1 the causative agent of enteric redmouth disease (ERM).

Rainbow trout were orally vaccinated with Aqua-Vac ERM Oral (MERCK Animal Health) or an experimental vaccine bacterin of *Y. ruckeri* O1. Both vaccines were tested with and without a booster vaccination four months post the primary vaccination. Furthermore, two groups of positive controls were included, one group receiving the experimental oral vaccine in a 50 times higher dose, and the other group receiving a single dose administered anally in order to bypass the stomach. Each group was bath challenged with 6.3×10^8 CFU/ml *Y. ruckeri*, six months post the primary vaccination. The challenge induced significant mortality in all the infected groups except for the groups vaccinated anally with a single dose or orally with the high dose of bacterin.

Both of these groups had 100% survival. These results show that a low dose of *Y. ruckeri* bacterin induces full protection when the bacterin is administered anally. Oral vaccination also induces full protection, however, at a dose 50 times higher than if the fish were to be vaccinated anally. This indicates that much of the orally fed antigen is digested in the stomach before it reaches the second segment of the intestine where it can be taken up as immunogenic antigens and presented to lymphocytes.

Augmentation of the Antibody Response of Atlantic Salmon by Oral Administration of Alginate-Encapsulated IPNV Antigens

Chen L, G Klaric, S Wadsworth, S Jayasinghe, T-Y Kuo, Ø Evensen & S Mutoloki (2014). *PLoS ONE* 9 (10): e109337, 9 pp. (Open Access publication available at http://tinyurl.com/q2um3cr)

Abstract

The objective of the present study was to assess the effect of alginate-encapsulated infectious pancreatic necrosis virus antigens in inducing the immune response of Atlantic salmon as booster vaccines.

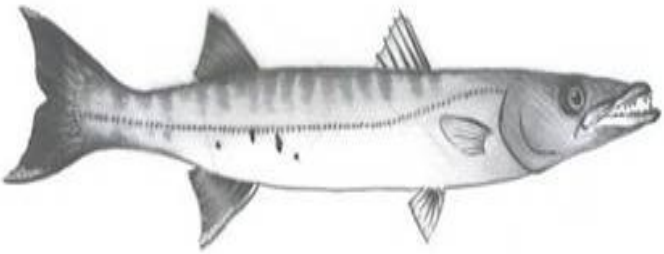
One year after intraperitoneal injection with an oil-adjuvanted vaccine, post-smolts were orally boosted either by 1) alginate-encapsulated IPNV antigens (ENCAP); 2) soluble antigens (UNENCAP) or 3) untreated feed (control). This was done twice, seven weeks apart. Sampling was done twice, firstly at 7 weeks post 1st oral boost and the 2nd, at 4 weeks after the 2nd oral boost. Samples included serum, head kidney, spleen and hindgut. Serum antibodies were analyzed by ELISA while tissues were used to assess the expression of IgM, IgT, CD4, GATA3, FOXP3, TGF-β and IL-10 genes by quantitative PCR.

Compared to controls, fish fed with ENCAP had a significant increase ($p<0.04$) in serum antibodies following the 1st boost but not after the 2nd boost. This coincided with significant up-regulation of CD4 and GATA3 genes. In contrast, serum antibodies in the UNENCAP group decreased both after the 1st and 2nd oral boosts. This was associated with significant up-regulation of FOXP3, TGF-β and IL-10 genes. The expression of IgT was not induced in the hindgut after the 1st oral boost but was significantly up-regulated following the 2nd one. CD4 and GATA3 mRNA expressions exhibited a similar pattern to IgT in the hindgut. IgM mRNA expression on the other hand was not differentially regulated at any of the times examined.

Our findings suggest that 1) Parenteral prime with oil-adjuvanted vaccines followed by oral boost with ENCAP results in augmentation of the systemic immune response; 2) Symmetrical prime and boost (mucosal) with ENCAP results in augmentation of mucosal immune response and 3) Symmetrical priming and boosting (mucosal) with soluble antigens results in the induction of systemic immune tolerance.

Photo at Left:
Trout swimming in the Georgia Aquarium.
Photo by Nick Saint-Erne

Know Your Fishes



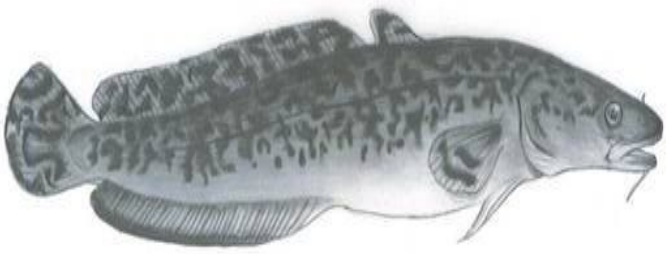
Barracudas (family Sphyraenidae) take their name from the Latin, meaning "pike-like" fishes. Their bodies are slender and elongated, perfectly adapted to successful ocean predators. They can attack with great speed and violence and often ambush prey. There are about 26 species of barracuda (genus *Sphyraena*) worldwide, in all the major oceans. The great barracuda, *Sphyraena barracuda,* is distributed throughout the Atlantic Ocean, as well as the Indian and Pacific Oceans.

The great barracuda is often considered potentially dangerous to humans because of its aggressive behavior and sharp teeth. Although occasional attacks on humans have been reported, none have been fatal. Unprovoked attacks are sometimes attributed to poor visibility or the fish's attraction to shiny objects and/or other indications of prey.

Barracudas are both a game and a food fish. The largest reported catch of a great barracuda was 1.7 meters (5.5 ft.) weighing in at 46.8 kg (103 lb.) off the coast of the Bahamas. In 2008, 60 tonnes of great barracuda, valued at $110,000, was landed in the US. Most of the catches (53%) in 2008 were caught off the Florida East Coast using hand lines. An additional 10 tonnes of Pacific barracuda was also commercially landed in 2008, valued at $16,000. It is not a Canadian fishery.

For additional information please see website:
http://www.CMPpublications.com/na_fisheries

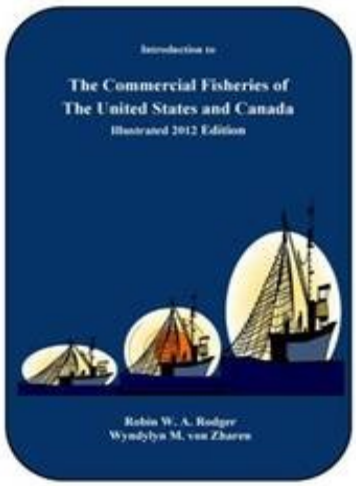
Know Your Fishes



Burbot, *Lota lota,* is a member of the cod family Gadidae, subfamily Lotinae (cuskfishes). It is the only species listed in *The Seafood List* under the burbot market name and has the same common name, although there is speculation that the North American and Western Eurasian species may differ. They are also the only freshwater member of the cod family. The name burbot is derived from the Latin 'barba' or beard referring to its chin barbel. Some scientists believe burbots were trapped inland when an arm of a prehistoric sea receded.

Burbot are found circum-globally in northern and Arctic regions of the Northern Hemisphere. In North America, burbot are widely distributed throughout Alaska, Canada and the northern US (above 40° latitude), including the Great Lakes. It is somewhat peculiarly missing in the extreme eastern regions of Canada (e.g., Nova Scotia). In the middle of the 20th century, burbot populations in the Great lakes declined due to the invasion of the sea lamprey and there is no record of US commercial catches between 1961 and 1985. However, burbot are returning to the Great Lakes in increasing numbers. In 2008, 6 tonnes of Burbot, valued at $5,000, was commercially landed in the US. Most of the catch in 2008 was in Wisconsin. Canada recorded 1 tonne of commercial landings in 2007.

For additional information please see website:
http://www.CMPpublications.com/na_fisheries



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

Rare Asian black spotted turtles seized in Bengal
By Indo Asian News Service | IANS
Kolkata, Jan 30, 2015

Border Security Force (BSF) personnel have seized 185 rare Asian black spotted turtles, *Geoclemys hamiltonii* , worth Rs.1.11 crore in the international market, in Kalanchi in West Bengal's North 24 Parganas district while they were being smuggled to Bangladesh.

Following a specific intelligence input, BSF personnel from Kalanchi border outpost laid an ambush Thursday and challenged two persons moving suspiciously towards Bangladesh with two big cloth bags. The duo dropped the bags and fled towards Bangladesh taking advantage of the fog and the dark, a BSF release said. The BSF personnel searched the area and found the turtles inside the bags. This is the largest seizure of rare Asian black spotted turtles in recent times.

"The BSF authorities immediately informed forest department officials as well as Bangaon customs office. The seized turtles have been handed over to the forest department through the customs office at Bangaon", the release said.

The Indian black spotted turtle is a medium-sized freshwater turtle from South Asia. Despite its common name, the colour of this attractive turtle varies hugely with the rigid upper shell, or 'carapace', ranging from reddish to dark brown or black, often with three yellowish ridges running along its length. These turtles are also known as Bengal black turtle, black pond turtle, Burmese black turtle, Cochin black turtle, Parker's black turtle, Sri Lanka black turtle.

The species is threatened as its meat is considered a delicacy in many areas, while it is also kept as a pet. The species is highly endangered in Bangladesh and Myanmar. It fetches more than USD $2,000 each in South-East Asian markets.

Rare Philippine Turtle Is Being Driven to Extinction by Pet Owners
By John R. Platt | Takepart.com February 3, 2015

When most people want a pet, they get a cat or a dog. Other people steal endangered species from the wild. That's the sad situation confronting the Palawan forest turtle, *Siebenrockiella leytensis,* a critically endangered species that lives on just a single island in the Philippines. Only about 3,000 of these rare turtles are believed to remain in the wild, a number that is shrinking rapidly. Over the past two months at least 186 forest turtles—more than 6 percent of the entire known population—have been rescued from five groups of poachers who intended to sell them on the illegal international pet trade, according to a report this week from TRAFFIC, the wildlife trade monitoring network.

The forest turtles' very rarity makes them even more desired, as collectors will pay large amounts of money on the black market for endangered turtles and tortoises. The rarer they are, the higher the price they fetch. The turtles were most likely headed to Europe or North America, said Chris Shepherd, TRAFFIC's Southeast Asia regional director.

"Southeast Asia is also seeing a booming increase in the exotic pet trade," he said, "so it is not inconceivable that they were headed somewhere a little closer to home." He said that no arrests have been made yet, although investigations are ongoing.

The Palawan forest turtle was once believed to be extinct. Unseen since 1920, the species was rediscovered in 2001. A scientific paper detailing that find was published in 2004. A booming illegal trade in the animals began soon after.

"The trade of the Palawan forest turtle is rampant, and most past conservation work has failed," said Pierre Fidenci, president of Endangered Species International, which has been active for several years in trying to protect the turtles. He said the poaching has become so bad that some of the sites that once held the turtles could now be depleted. "If trade continues at that level, this species could be gone within its major habitat sites in a decade or so," Fidenci said.

Protecting the turtles won't be expensive, but it will require effort. "To succeed in saving the Palawan forest turtle, we must create core habitat protection zones where active patrols are conducted using local communities," he said. "Further inspections at ports, exchange transits, and other locations are necessary as well."

If the rescued turtles are found to be healthy, they will be returned to the wild. Hopefully, this time they'll be there to stay.
Original article from TakePart

Amphibian Chytrid Fungus Reaches Madagascar
SOURCE: Helmholtz Centre for Environmental Research - UFZ

The chytrid fungus, which is fatal to amphibians, has been detected in Madagascar for the first time. This means that the chytridiomycosis pandemic, which has been largely responsible for the decimation of the salamander, frog and toad populations in the USA, Central America and Australia, has now reached a biodiversity hotspot. The island in the Indian Ocean is home to around 290 species of amphibians that are not found anywhere else in the world. Another 200 frog species that have not yet been classified are also thought to live on the island. Researchers from the Helmholtz Centre for Environmental Research (UFZ) and TU Braunschweig, together with international colleagues, are therefore proposing an emergency plan. This includes monitoring the spread of the pathogenic fungus, building amphibian breeding stations and developing probiotic treatments, say the scientists, writing in *Scientific Reports*, the acclaimed open-access journal from the publishers of *Nature*.

The entire amphibian class is currently afflicted by a global pandemic that is accelerating extinction at an alarming rate. Although habitat loss caused by human activity still constitutes the main threat to amphibian populations, habitat protection no longer provides any guarantee of amphibian survival. Infectious diseases are now threatening even seemingly secluded habitats. The most devastating of the known amphibian diseases is chytridiomycosis, which is caused by a deadly chytrid fungus (*Batrachochytrium dendrobatidis*, or Bd). The fungus attacks the skin, which is particularly important in amphibians because they breathe through it. A large number of species have already been lost in this way -- particularly in tropical Central America, where two-thirds of the colourful harlequin frog species have already been decimated across their entire area of distribution. Bd has now been identified in over 500 amphibian species, 200 of which have seen a significant decline in numbers. The pathogen is therefore classified worldwide as one of the greatest threats to biodiversity.

Until now, however, a few islands like Madagascar were thought not to have been affected. The last series of tests from 2005 to 2010 found no trace of the pathogenic fungus there. However, an analysis of the latest series of tests shows that the chytrid fungus also poses a threat to amphibians in Madagascar. "This is sad news for amphibian-lovers around the world," says Dr Dirk Schmeller of the UFZ, who was involved in analysing the samples. "Firstly, it means that an island that is home to a particularly high number of amphibian species is now at risk. Several hundred species live only on this island. And, secondly, if the pathogen has managed to reach such a secluded island, it can and will occur everywhere."

For the study that has just been published, the research team analysed samples from over 4000 amphibians from 50 locations in Madagascar taken since 2005. Samples from four species of Madagascan frog (Mantidactylus sp.) taken in 2010, and from one Mascarene frog (*Ptychadena mascareniensis*) taken in 2011 from the remote Makay massif tested positive for the fungus. In samples from 2013 and 2014 the pathogen was found in five different regions. Prof. Miguel Vences from TU Braunschweig says, "The chytrid fungus was found in all four families of the indigenous Madagascan frogs, which means it has the potential to infect diverse species. This is a shock!" The study also shows that the disease affects amphibians at medium to high altitudes, which ties in with observations from other parts of the world, where the effects of the amphibian epidemic have been felt primarily in the mountains.

The fact that the fungus has been identified in a very remote part of the island has puzzled the researchers. There is some hope that it may prove to be a previously undiscovered, native strain of the pathogen, which may have existed in the region for some time and have gone undetected because of a lack of samples. In this case, Madagascar's amphibians may have developed resistance to it. However, further research is needed to confirm this hypothesis before the all-clear can be given.

It is also possible that the fungus was brought to the island in crustaceans or the Asian common toad (*Duttaphrynus melanostictus*), carried in by migratory birds or humans. "Luckily, there have not yet been any dramatic declines in amphibian populations in Madagascar," Dirk Schmeller reports. "However, the pathogen appears to be more widespread in some places than others. Madagascar may have several strains of the pathogen, maybe even the global, hypervirulent strain. This shows how important it is to be able to isolate the pathogen and analyse it genetically, which is something we haven't yet succeeded in doing."

At the same time, the researchers recommend continuing with the monitoring programme across the entire country to observe the spread of the disease. The scientists also suggest setting up extra breeding stations for key species, in addition to the two centres already being built, to act as arks, so that enough amphibians could be bred to recolonise the habitats in a crisis. "We are also hopeful that we may be able to suppress the growth of the Bd pathogen with the help of skin bacteria," says Miguel Vences. "It might then be possible to use these bacteria as a kind of probiotic

skin ointment in the future." A high diversity of microbial communities in the water could also reduce the potential for infection, according to earlier investigations conducted by UFZ researchers and published in *Current Biology*.

The outbreak of amphibian chytridiomycosis in Madagascar puts an additional seven per cent of the world's amphibian species at risk, according to figures from the Amphibian Survival Alliance (ASA). "The decline in Madagascan amphibians is not just a concern for herpetologists and frog researchers," says Dr Franco Andreone from the International Union for Conservation of Nature (IUCN), who is one of the study authors. "It would be a great loss for the entire world." In the coming months, the scientists therefore plan to work with the government to draw up an emergency plan to prevent this scenario.

Story Source:

The above story is based on materials provided by **Helmholtz Centre for Environmental Research - UFZ**.

Note: Materials may be edited for content and length.

Journal Reference:

Molly C. Bletz, Gonçalo M. Rosa, Franco Andreone, Elodie A. Courtois, Dirk S. Schmeller, Nirhy H. C. Rabibisoa, Falitiana C. E. Rabemananjara, Liliane Raharivololoniaina, Miguel Vences, Ché Weldon, Devin Edmonds, Christopher J. Raxworthy, Reid N. Harris, Matthew C. Fisher, Angelica Crottini.
Widespread presence of the pathogenic fungus Batrachochytrium dendrobatidis in wild amphibian communities in Madagascar.
Scientific Reports, 2015; 5: 8633
DOI: 10.1038/srep08633

Wikipedia photo of Heterixalus rutenbergi

Deadly Frog Fungus Pops Up in Madagascar, an Amphibian Wonderland

Jane J. Lee
National Geographic

Madagascar is home to a mind-boggling array of frogs, 99 percent of which are found nowhere else in the world. Madagascar has been spared the scourge of the chytrid fungus, until recently. But a new study finds the island nation now also hosts the greatest threat to amphibian biodiversity in modern times—the chytrid fungus.

As many as 7 percent of the world's amphibian species live only in Madagascar, says Molly Bletz, a researcher at the Braunschweig University of Technology in Germany. Chytrid is responsible for the decline or extinction of hundreds of amphibian species around the world. One forest in Panama lost 30 amphibian species to the fungus in about a year, according to a 2010 study.

Researchers had thought Madagascar was chytrid-free. A 2014 study found chytrid on Madagascar frogs shipped to the U.S. for the pet trade, but researchers weren't sure whether the animals were contaminated en route or infected in Madagascar. (See "African Clawed Frog Spreads Deadly Amphibian Fungus.")

But a new study in the journal *Scientific Reports* finds that chytrid is present in multiple Madagascar frog species. Bletz and colleagues examined skin swabs and tissue samples from 4,155 amphibians tested for chytrid from 2005 to 2014. They found, to their surprise, that the fungus began to appear on frogs starting in 2010.

What they haven't found yet is sick frogs. "It could mean we just caught it very early," Bletz says, or it's possible the chytrid strain in Madagascar isn't very lethal.

For more information, see full story at:
http://news.nationalgeographic.com/news/2015/02/150226-chytrid-fungus-frogs-madagascar-animals-science/

For a list of frogs from Madagascar, see:
https://en.wikipedia.org/wiki/List_of_amphibians_of_Madagascar

Low impact of Chytridiomycosis on frog recruitment enables persistence in refuges despite high adult mortality

Biological Conservation
Volume 182, February 2015, Pages 36–43

Ben C. Scheele[a, b,],
David A. Hunter[b],
Lee F. Skerratt[c],
Laura A. Brannelly[c],
Don A. Driscoll[a]

Highlights:
• Following major declines, a threatened frog now co-exists with chytridiomycosis.
• Disease causes high adult mortality, infection intensity rises during the breeding season.
• The pathogen was rare in tadpoles which develop in water >28 °C, and juveniles.
• High recruitment likely facilitates persistence despite high adult mortality.
• Management that increases recruitment may prevent extinction of declining amphibian

The global chytridiomycosis pandemic caused by the pathogen *Batrachochytrium dendrobatidis* (Bd) is implicated in the apparent extinction or severe decline of over 200 amphibian species. Many declined species now only persist in isolated remnant populations. In this study we examine how remnant populations coexist with Bd, focusing on disease impact on adult survival and recruitment potential in the chytridiomycosis-threatened frog *Litoria verreauxii alpina*.

Using skeletochronology we found that the adult male population in both 2011 and 2012 was dominated by a two year old age cohort. The lack of recruitment into the three year old cohort in 2012 indicates that annual adult survival is very low. Combined with high Bd prevalence and heavy infection burdens, the pathogen appears to drive almost complete mortality of breeding adults over their first breeding season. However, adults successfully mate prior to large increases in disease prevalence that occurs during the breeding season.

Infection prevalence among tadpoles and juveniles is low. Exposure to warm water could provide a mechanism for avoiding or clearing Bd infection. Relatively low Bd prevalence in juveniles prior to dispersal into terrestrial habitat indicates that Bd has minimal impact on early life history stages. As such, recruitment is probably high, allowing populations to persist despite low adult survival. This dependence on reliable annual recruitment may explain why remnant populations persist in permanent ponds rather than ephemeral ponds that were historically occupied. New management strategies that focus on increasing recruitment may provide a way forward for the management of disease-threatened amphibian species.

Micropredators dictate occurrence of deadly amphibian disease

Current Biology 2014.
dx.doi.org/10.1016/j.cub.2013.11.032

An international team of researchers has made important progress in understanding the distribution of the deadly amphibian chytrid pathogen. In some regions, the deadly impact of the pathogen appears to be hampered by small predators, naturally occurring in freshwater bodies. These micropredators may efficiently reduce the number of free-swimming infectious stages (zoospores) by consuming them. This natural behavior will reduce the infection pressure on potential amphibian hosts. The team of researchers state that their results raise the hope of successfully fighting chytridiomycosis, nowadays one of the most deadly wildlife diseases.

The entire class of the amphibians is greatly affected by the current wave of global extinctions. Although anthropogenic habitat alteration and fragmentation are the most important causes of amphibian biodiversity loss, mere conservation of amphibian habitats no longer guarantees amphibian survival. Indeed, the introduction of infectious diseases has been shown to drive amphibians to extinction even in seemingly pristine habitats.

Chytridiomycosis is a disease which is devastating amphibians around the world. It is caused by the deadly chytrid skin fungus (Batrachochytrium dendrobatidis), or Bd, as scientists call it in short. Bd infects the skin of amphibians, which is an important respiratory organ for them, allowing them to breathe also in the water. "Bd needs to establish in a new environment and has usually a tight time window to infect a suitable host, either an adult amphibian or tadpoles and larvae of this species group", says veterinarian Prof. Dr. Frank Pasmans from the University of Ghent.

Water bodies that do not support a diverse and abundant micropredator community, such as those that suffer from anthropogenic and environmental pressures, could lead to higher infection rates that lead to outbreaks of disease and amphibian population crashes. The study also contributes to a better understanding on how ecosystem health is linked to the establishment of pathogens in new environments, as only in healthy ecosystems the microorganisms might be able to consume zoospores effectively.

Provided by:
Helmholtz Association of German Research Centres

http://phys.org/news/2014-01-micropredators-dictate-occurrence-deadly-amphibian.html

100% Death Rate for Baby Killer Whales Along the Canadian West Coast in the Past 3 Years

The Province,

For an endangered orca population living off the British Columbia, Canada coast, the death of a young adult female "couldn't be much worse than losing an 18-year-old female human," according to a marine scientist Dr. Peter Ross, a senior scientist at the Vancouver Aquarium.

"This was a female who was at the sunrise of her reproductive life. There's virtually no survival of the babies anymore, which of course means there's no future. We have to turn this around somehow," said Ken Balcomb of the Center for Whale Research.

See more at: http://www.globalresearch.ca/100-death-rate-for-baby-killer-whales-along-the-canadian-west-coast-in-the-past-3-years/5419272#sthash.61PoZUAW.dpuf

Fish Farm of the Future Goes Vegetarian to Save Seafood

Fish farms have a big problem: They've been making feed out of sardines and anchovies from the oceans, a source that could be depleted within a few decades. A California company called Two X Sea could have a solution: They've developed the first completely vegetarian fish feed to be used commercially in the U.S., with the help of a USDA scientist, Dr Rick Barrows, who has made fish nutrition his life's work. Although this plant-based food is more expensive to produce than food made with wild-caought fish, it ultimately may be the best solution for future aquaculture use.

http://www.bloomberg.com/news/videos/2015-02-23/fish-farm-of-the-future-goes-vegetarian-to-save-seafood
(Video by: Alan Jeffries, Amy Marino)

Sea turtles face growing danger due to plastic trash in Australian waters
by Cat DiStasio,
The Guardian—01/30/15

Sea turtles living off the coast of Australia face a growing danger in their own habitat: ocean plastic. The amount of plastic debris in the waters surrounding Australia is growing rapidly and so are the unprecedented numbers of injuries sustained by sea turtles and other ocean creatures. Veterinarians warn that humans should find ways to control the amount of plastic waste before the effects become irreversible.

Plastics in the ocean become shredded over time into barely visible particles called "microplastics" and these pose the most danger. Animals are consuming microplastics in alarming numbers, and that leads to a variety of internal injuries and illnesses.

Marine biologists and veterinarians at the wildlife hospital at the Taronga Zoo in Sydney have been caring for increasing numbers of sea turtles injured by ocean microplastics. While undergoing rehabilitation, the sea turtles live in an enclosed pool, and evidence of the plastics problem is apparent. Caregivers find more plastic in the pool each day, as the turtles excrete shreds of balloons or plastic bags into the water.

Marine researchers estimate there are some five trillion pieces of plastic trash floating in the oceans around the globe. The majority of the junk is suspended beneath the surface, so it's largely unseen in aerial photography or by the naked eye. Because all those plastic bottles, bags, and other non-biodegradable items are hanging out under the water, they pose a serious threat to sea turtles and other creatures who spend the majority of their lives under the surface.

The turtles treated at the zoo in Sydney are released back into the wild upon recovery. Obviously, veterinarians cannot capture, treat, and release every turtle, dolphin, whale, and fish that consumes plastic debris. Conservationists and everyday consumers of plastic goods will have to work harder to reduce the amount of waste that ends up in the world's oceans.

Plastic trash netted from the ocean.
Photo from:
http://inhabitat.com/the-fallacy-of-cleaning-the-gyres-of-plastic-with-a-floating-ocean-cleanup-array/

Ranaviruses: Emerging Threat to Amphibians

Amphibians are integral to our ecosystem as predators, as a food resource, and as ecological indicators for water pollution and habitat quality. And currently, amphibians face increasing disease challenges.

Like any free-living species, amphibians are host to a variety of pathogens including bacteria, fungi, viruses, and parasitic worms. While the majority of pathogens are relatively benign, viral pathogens in the genus Ranavirus are responsible for catastrophic die-offs across the globe. In the United States, ranaviruses have been linked to die-offs in 29 different amphibian species across 25 states.

Ranaviruses infect cold-blooded vertebrates, including bony fish, reptiles, and amphibians. They are double-stranded DNA viruses that multiply in host cells. Two species of ranviruses are known to infect amphibians in North America: frog virus 3 (FV3) and Ambystoma tigrinum virus (ATV). While FV3 is widespread across North America, ATV has only been detected in regions west of the Mississippi River. Both FV3 and ATV can infect many different species of amphibians, but the outcome of infection varies by species. For free report, go to:
https://www.extension.purdue.edu/extmedia/FNR/FNR-485-W.pdf

Giant Wels Catfish Caught with Fishing Rod

Italian fisherman Dino Ferrari landed what could potentially be a world record wels catfish in Italy's Po Delta. Ferrari's fish measured an incredible 8.7 feet in length and weighed 280 pounds. The current weight record for a wels catfish is over 300 pounds, but according to the Daily Mirror, Ferrari may have set a record for the largest catfish to be caught with a rod and reel. Here's photographic proof that this thing could just swallow an adult if it wanted to. It's *enormous!*

Photo credit: Sportex Italia/Facebook
http://ftw.usatoday.com/2015/02/italian-fisherman-catches-monstrous-280-pound-catfish;
https://www.facebook.com/sportexitaly/photos_stream

Goldfish Has Surgery to Remove Cancerous Eye
by Discovery News

A lucky Scottish goldfish had a cancerous eye removed in a tricky surgical procedure. Exotic animal specialist Brigitte Lord performed the operation, successfully removing the eye of the 6-inch goldfish named Star. "This is a highly specialized field," Lord said on the Inglis Vets Facebook page. "Using anesthetic on a goldfish carries a very high risk, and I'm delighted for the owner that everything went okay and the owners are happy."

Star swims in a holding container prior to surgery to remove a tumor from its eye.
Photo Credit: Facebook/Inglis Veterinary Hospital

Star is owned by Janie Gordon, of Dollar, and her daughter Abby. The younger Gordon won Star at a fair 12 years ago. So dedicated was the elder Gordon to hers and her daughter's fish that she also arranged surgery for their other goldfish, Star's tank mate Nemo, who received surgery to remove a lump on the day Star's cancer was removed. The two surgeries together cost Ms. Gordon nearly 500 pounds (about US $755).

In addition to Lord, the procedure was attended by a veterinarian keeping Star under sedation and a nurse monitoring the fish's heart rate. The team used Doppler ultrasound through a set of earphones to gauge Star's pulse rate and also keep tabs on its blood flow. They got Star sedated by giving it a syringe full of oxygenated water containing an anesthetic.

Post-operatively, Star was held for eight minutes, mouth kept open, in oxygenated water while being gently moved to get water flowing over its gills. Soon after, she was back to life and swimming in the water on her own. "I know it seems like a lot of money to spend on an operation for a goldfish," Janie Gordon said. "But what was the alternative? I think we've a social responsibility to look after our pets and I know my daughter would have been distraught if anything had happened to the goldfish."

For complete article, see:
http://news.discovery.com/animals/pets/goldfish-has-surgery-to-remove-cancerous-eye-150310.htm

Fine Tripled for Food Safety Breach

An importer who sold 1500 kg of cooked prawns imported to Australia from Vietnam without undertaking mandatory food safety tests has had the fine nearly tripled on appeal. After an initial prosecution and fine of $7000 and given the seriousness of the offence, the Commonwealth Director of Public Prosecution pursued the matter, launching a successful appeal that has resulted in a revised fine of $20,000 for the importer.

In March 2014, Mr Xu Chun Dong, company director for B&E Packaging pleaded guilty to a breach of the Imported Food Control Act 1992. The prawns imported from Vietnam were subject to the Imported Food inspection Scheme to ensure compliance with Australian Food Standards. Australian requirements mean the prawns had to be tested for food safety risks including bacteria that can cause food poisoning such as staphylococcus, salmonella, and cholera.

The Department of Agriculture's First Assistant Secretary for Compliance, Raelene Vivian, said the revised fine of $20,000 sent a clear message about the seriousness of the offence. "This appeal shows that the department takes its role in managing compliance of imported food with Australia's standards seriously and will use the full force of the law to achieve a just result," said Ms Vivian. "Reckless and deliberate disregard of Australia's food safety and importing requirements will not be tolerated and can attract fines of $330,000 for a corporation."

The department helps protect Australia's food producers by managing the risk of exotic pests and diseases entering the country. It also inspects imported food to check it meets Australian requirements for public health and safety. The requirements exist to protect the Australian community from potential food poisoning hazards.

For more information about importing food to Australia go to:
www.agriculture.gov.au/biosecurity/import/food,
and Imported Food inspection Scheme visit:
www.agriculture.gov.au/biosecurity/import/food/inspection-scheme.

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

FAO veterinarian addresses how aquaculture may feed a growing human population

In a recent presentation Dr. Arni M. Mathiesen, a veterinarian and Assistant Deputy-General of the Fisheries and Aquaculture Department of the United Nations' Food and Agriculture Organization (FAO), addressed aquaculture might be an essential part of feeding the world's growing population.

His presentation, now on You Tube (http://tinyurl.com/pae2glu), addressed the need for more food for a growing world and provided data about how aquaculture was the most promising method of meeting food needs.

"From the point of view of an ecological footprint, aquaculture does very well compared to terrestrial animal food production systems," he said. Moreover, Dr. Mathiesen showed data comparing aquaculture production with terrestrial livestock production.

With an emphasis that aquaculture generally use less land and less freshwater, and emit less water pollution and less greenhouse gasses than terrestrial systems, he shows how aquaculture production has fewer environmental impacts overall than chicken. The way forward must be to farm more fish and seafood because it's the most environmentally-friendly option.

Yes, there are impacts from aquaculture, he suggested, but they are less than other options. "Don't tell me there are more environmental constraints to producing fish than other animal proteins, when the facts show the exact opposite," he said. But growth must be managed well: "This has to be done sustainably, otherwise we might be courting disaster," he added.

	Ecosystems		Water			Climate
Species Group	*Land Use (ha / t edible protein)*	*Use of wild fish in feed (Fish-In / Fish-Out Ratio)*	*Freshwater Consumption (m^3 / kg edible protein)*	*Water Pollution (kg P / t edible protein)*	*Water Pollution (kg N / t edible protein)*	*Greenhouse Gas Intensity (t CO_2e / t edible protein)*
Carps	12.0	0.2	61.4	97	329	47.2
Mollusks	0.0	0.0	0.0	-148	-136	11.1
Shrimps	16.4	0.8	4.4	104	422	161.7
Tilapia	7.5	0.7	15.9	82	349	40.7
Catfish	9.5	0.4	52.2	97	234	134.8
Salmonids	2.4	1.9	0.0	48	182	9.8
All 6 species groups						
World aquaculture	9.1	0.3	40.4	76	273	66.8
Terrestrial Livestock						
Pork	2.0	N/A	56.5	120	800	57.6
Chicken	3.0	N/A	34.3	40	300	42.3
Beef	50-145	N/A	112.5	180	1200	337.2

European College of Aquatic Animal Health
http://www.ebvs.org/index.php/news-35

CALL FOR DE FACTO DIPLOMATES

European College of Aquatic Animal Health (ECAAH) has been provisionally recognised by EBVS in April 2014. At this time, the College is seeking for colleagues interested in becoming a De Facto Diplomate in Aquatic Animal Health:

1. Membership and qualifications for membership

In order to establish the ECAAH, the Executive Committee has the responsibility of electing de facto Diplomates. A ***De facto* Diplomate** is a Diplomate appointed by the Interim Executive Committee. During the first five years following provisional recognition of the College, the Interim Executive Committee may appoint a small number of additional *de facto* Diplomates who are also "Founding Diplomates" and are expected to contribute to the running of the College and must meet the general criteria described below for the members of the Interim Executive Committee. Those wishing to apply for membership of the ECAAH under this category should contact the ECAAH executive committee at eathan@vet.uth.gr

Please note that under the terms of the provisional recognition granted to the ECAAH by the European Board of Veterinary Specialities (EBVS), the criteria outlined below must be strictly applied:

2. Criteria for selection of De facto Diplomates:

De facto Diplomate must be an initiator in their field as evidenced by the following criteria:

i. Have achieved distinction in the field, and have qualifications far exceeding those proposed as necessary for candidates to take the certifying examination of the organization;

ii. Be internationally recognized as a qualified specialist by peers, and

a. have at least ten years' experience in the specialty, and by teaching, research, or practice have contributed significantly to the development of the specialty or

b. have advanced training (PhD or equivalent) in the specialty; have demonstrated competency through teaching, research or practice in the specialty to which the individual devotes most of his or her professional time, and

c. be author of at least ten significant publications in peer-reviewed journals resulting from the research or practice in the specialty;

iii. Be uncontroversial to the majority of the membership;

iv. Spend at least 50 per cent of their time in the specialty, based on a normal working week of 40 hours;

v. Be practicing or licensed to practice in Europe;

vi. Practice scientific, evidence-based veterinary medicine, which complies with animal welfare legislation;

viii. Display the willingness to contribute to the growth of the College (e.g. by training residents)

Selection will be made by the Interim Executive Committee on the basis of a submitted CV. All persons known to be interested in becoming a member of ECAAH shall be invited to apply for *de facto* registration by means of a personal letter, or by open advertisement in journals or congresses outlining the above mentioned requirements.

ON BEHALF OF THE EXECUTIVE COMMITTEE:
Prof. Fotini Athanasopoulou
Univ. of Thessaly, Greece
Past President, World Aquatic Veterinary Medicine Association.
Ex Dean of the Faculty of Veterinary Medicine
Laboratory of Ichthyology and Fish Diseases,
Veterinary Faculty
221 Trikalon str, Karditsa 43100 Greece
Tel +30 24410 66008, 66045, +30 6984214219

CAHPS Rolled Out at Aquaculture America 2015

The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), in collaboration with the National Aquaculture Association (NAA), rolled out its joint concept for Commercial Aquaculture Health Program Standards (CAHPS) at the recent Aquaculture America 2015 Conference in New Orleans, LA.

Representatives from the NAA and the VS Aquaculture Program Team have been developing draft program standards to establish a voluntary, non-regulatory framework for the improvement and verification of the health of farmed aquatic animals produced in U.S. commercial aquaculture industry sectors. The goal of CAHPS is to support various business objectives, including improved health management, protection and expansion of aquaculture business opportunities, and promotion and facilitation of trade, as well as improved resource protection and environmental sustainability.

A ten page document on CAHPS is posted on the APHIS VS Aquaculture webpage at:
http://www.aphis.usda.gov/animal-health/aquaculture.
Comments on the concept and framework may be emailed to - VS.SPRS.Feedback@aphis.usda.gov.

MEETINGS OF INTEREST TO AQUATIC VETERINARIANS

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

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.sgualumnicommunity.gd/events/event_details.asp?id=524181

40th WSAVA Congress

May 15-18, 2015
Bangkok, Thailand

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

WSAVA is planning to welcome you to Bangkok with a selection of amazing evening social events. Kicking off with the opening ceremony extravaganza, Friday May 15; taking you on a **fantastic mystical journey** into the forests of ancient folklore of Thailand.

Saturday, May 16, will be Thai Theme Night where we invite you to **dine with the elephants** in the middle of Bangkok!

Sunday, May 17, will be an opportunity to get creative when we invite you to **dress in national costume** and wow us at the Gala dinner; get ready for a spectacular display of sarees, sarongs, kimonos and batik.

The closing ceremony and farewell reception on Monday will be held at the Congress venue and is free to all registered participants.

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

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, Aug 29)
- Labs (Sunday, August 30)
- Zoo Outing and Reception (Tuesday, Sept 1)
- Booth and Tabletop Exhibition
- Networking Opportunities

See: **VISIT EXOTICSCON.ORG**

Association of Exotic Mammal Veterinarians

ARAV

Association of Avian Veterinarians
Advancing & Promoting Avian Medicine and Stewardship

2015 International Summit on Fibropapillomatosis of Marine Turtles: Global Status, Trends, and Population Impacts

June 11-14, 2015
NOAA Daniel K. Inouye Regional Center
on Ford Island, Pearl Harbor, Honolulu, Hawaii

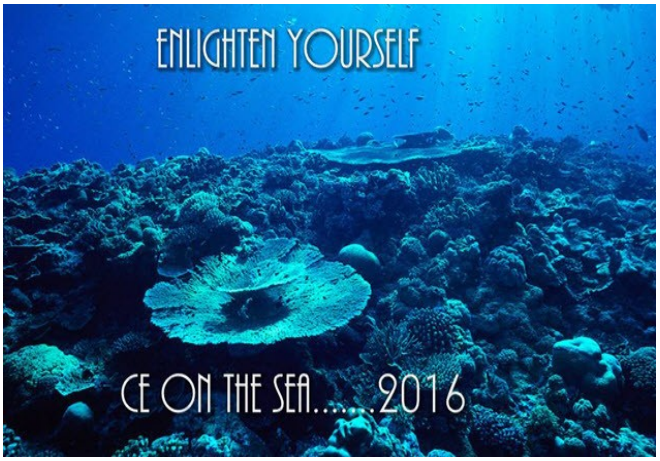
The Summit is open to those who have data on status and trends of FP. This includes, but is not limited to, expert participants from five regions for which invitations already extended by the Summit Steering Committee have been accepted. In addition, participation may include representatives from other organizations that also promote and support research on FP. The Summit is open to everyone to attend. However, pre-arrangements for both USA and non-USA citizens will be needed in order to enter the Pearl Harbor Naval Base. A preliminary Agenda for the Summit will be sent out during late March 2015.

The aims of the Summit are:
· To identify areas where substantial status and trend data exist for fibropapillomatosis (FP) in sea turtles.
· Convene an expert working group to evaluate data and identify data gaps.
· Identify priority regions where status and trends data would be desirable.
· To exchange ideas, strengthen skills and share examples of good practice.
· Develop recommendations for standardized monitoring of FP.

Steering Committee
George Balazs – Chair, NOAA Pacific Islands Fisheries Science Center
Allen Foley – Florida Fish and Wildlife Conservation Commission
Thierry Work – USGS National Wildlife Health Center, Honolulu, Hawaii
Stacy Hargrove – NOAA Southeast Fisheries Science Center
Shandell Brunson – NOAA Pacific Islands Fisheries Science Center

Following the workshop, the Steering Committee in collaboration with invitational co-authors will draft a paper summarizing global trends of FP, its demographic impacts, future research needs, and guidelines for standardized monitoring of this disease.

For additional information please write to the Summit Steering Committee point of contact:
George.Balazs@noaa.gov



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 staterooms 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 Facebook: *VetTechLife Veterinary CE on the Sea 2016* .

SeaVet Clinical Training Course
June 15-25, 2015
University of Florida, College of Veterinary Medicine
Gainesville, FL

SeaVet Clinical Training is an intensive nine day course designed to teach veterinary medical students and veterinarians through didactic lecture, case-based problem-solving and practical experience. The program also features an educational and interactive hands-on training. This is a three credit professional class through the University of Florida. Academic credit will only be granted to University of Florida veterinary students.

Continuing education credits may be earned by veterinarians. This course has a maximum of 25 allowed by the state of Florida. If requested, a form will be provided at start of the course to keep track of your hours. If you are not in Florida, your state has the right to refuse the credits. However, the University of Florida, College of Veterinary Medicine is accredited with NAVC and out-of-state veterinarians have not been denied credits after attending past SeaVet courses.

IMPORTANT NOTICE: This course is being offered exclusively for Veterinary Students and Licensed Veterinarians. Registrations will not be accepted otherwise.

For more information and to register, go to www.conference.ifas.ufl.edu/seavet/index.html.

For other information contact:
Rachael Dailey
Course Organizer
University of Florida,
College of Veterinary Medicine
PO Box 100136 / Gainesville, FL 32610-0136
Phone: 352-294-4312 / Fax: 352-392-8289
Email: rachael.dailey@ufl.edu

WAVMA is now on Facebook!

Find us on Facebook

Assisted by the WAVMA Student Committee, WAVMA and aquatic veterinary medicine is being actively promoted on Facebook.

Become a WAVMA "friend" and feel free to post information useful for other veterinarians, veterinary students, and inform the public about what aquatic veterinarians do.

Simply go to www.facebook.com and search for "WAVMA"

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

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, student travel awards, and other information, go to: www.iaaam.org/2015-iaaam-conference-and-meeting.

AQUARAMA 2015
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.

56TH ANNUAL
WESTERN FISH DISEASE WORKSHOP

JUNE 2-4, 2015
SHERATON STEAMBOAT RESORT
STEAMBOAT SPRINGS, COLORADO

56th Annual Western Fish Disease Workshop
June 2-4, 2015
Steamboat Springs, Colorado

Please join us this year at the Sheraton Steamboat resort in beautiful Steamboat Springs, Colorado for the 2015 Western Fish Disease Workshop (WFDW) on June 2-4, 2015. The WFDW is an annual conference designed to address fish health issues affecting aquaculture and wild fish populations in the western United States, Canada, and the Pacific Ocean. Researchers, fish health professionals, veterinarians, and students come together to present current topics of interest in all fields of fish health.

Presentations cover identification, diagnostics, treatment, and management of a variety of bacterial, viral, and parasitic pathogens, and poster sessions allow students and vendors to present their current research and products in an informal setting, and an evening banquet allows individuals to network and communicate while enjoying a good meal and entertainment. The WFDW also offers RACE Continuing Education credit for fish health professionals and veterinarians.

Online registration is available at http://tinyurl.com/mnszt2c, and hotel reservations can be made through http://tinyurl.com/k9jz2fj. For more details on this conference, registration, the CE program, and how to submit a presentation, contact Brandon Taro (brandon.taro@wyo.gov, +1 307-766-5620 work, +1 307-399-9806 cell), or Vicki Milano (vicki.milano@state.co.us, +1 970-370-3015 work).

Third International Symposium on Ranaviruses

30 May – 1 June 2015
Gainesville, Florida, USA

We invite you to join us for the Third International Symposium on Ranaviruses, 30 May – 1 June 2015, in Gainesville, Florida, USA. Ranaviruses (Family *Iridoviridae*) are a group of viruses that can cause disease in ectothermic vertebrate species (i.e., amphibians, reptiles and fish). Ranaviruses have caused die-offs of amphibians and fish around the world, including species of conservation concern, and have recently been linked to population declines of several amphibian species. 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 accumulating evidence of their impacts on wild and cultured populations has sparked a diversity of research programs in all areas of *Ranavirus*biology.

The Third International Symposium on Ranaviruses, organized by the Global Ranavirus Consortium (ranavirus.org), will bring together professionals and students from around the globe to discuss all aspects of ranavirus biology, including:

- Ecology, Evolution, and Phylogenetics
- Host-Pathogen Interactions
- Molecular Identification and Characterization
- Immunology and Pathology
- Mechanisms of Emergence and Conservation

In addition to oral presentations by experts and students, there will be a keynote address by Dr. Richard Whittington (University of Sydney), a poster session and social event, and several breakout discussions. There will also be a day devoted to workshops that cover important topics, such as the design and analysis of ranavirus studies, aseptic sample collection for ranavirus testing, and cutting-edge techniques for molecular diagnostics.

The Third International Symposium on Ranaviruses will be followed by the Fifth Florida Marine Mammal Conference.

We encourage all individuals with an interest in wildlife diseases to attend. More information can be found on the conference website: http://conference.ifas.ufl.edu/aeh/ranavirus/

We hope to see you in Gainesville!

Amanda L. J. Duffus Thomas B. Waltzek Matthew J. Gray Jesse L. Brunner

Fifth Marine Mammal Health Conference

June 2-4 2015
Gainesville, Florida.

The University of Florida's Aquatic Animal health Program is pleased and excited to invite you to join us for the 2015 Aquatic Ecosystem Health conference consisting of two back-to-back meetings: the Fifth Florida Marine Mammal Health Conference, June 2-4 2015 directly following the Third International Symposium on Ranaviruses, May 30-June 1 in Gainesville, Florida.

The focus of the Fifth Marine Mammal Health Conference will be to discuss how Florida faces the same global challenges affecting aquatic ecosystems worldwide including development pressure, resource depletion, water quality deterioration, chemical contamination, biotoxin imbalance, trophic level disruption and an increasing number of marine animal mortality events.

The Fifth Florida Marine Mammal Health Conference will bring together scientists, veterinarians, policy makers and students from throughout Florida to discuss environmental factors and their interrelationships with marine animal health, including:

Ecosystem health assessments and monitoring
Infectious diseases
Anthropogenic health stressors
Molecular techniques and immunology
Reproductive health
Conservation solutions
Role of government in ecosystem health

In addition to oral presentations by experts and students, there will be Keynote addresses by Dr. Jan Landsberg (Florida Fish and Wildlife Commission) and Dr. John Reynolds (Mote Marine Laboratory), a panel discussion, and a poster session.

The conference will be held at the Hilton University of Florida Conference Center and there will also be a social networking event held at the Florida Museum of Natural History (http://www.flmnh.ufl.edu/).

We encourage all individuals with an interest in ecosystem health, wildlife diseases and marine mammal health to attend both meetings (http://conference.ifas.ufl.edu/aeh/).

More information can be found on the conference website: (http://conference.ifas.ufl.edu/aeh/marinemammal).

We hope to see you in Gainesville!

Fifth Florida Marine Mammal Health Conference Organizing Committee:
Mike Walsh, Thomas Waltzek, Martine deWit, Iske Larkin, Craig Pelton, Roger Reep, John Reynolds, Nicole Stacy, and Jim Wellehan.

World Congress of Aquaculture and Fisheries
November 6-8, 2015
Qingdao, China

The main theme of WCAF 2015 is the Green Aquaculture-Innovation & Sustainability. The WCAF 2015 will bring together scientific leaders from all over the world, as well as business executives and scientists to the field of Aquaculture and Fisheries.

Aquaculture and Fisheries is a multidisciplinary science, we expected to get together with tentative topics for plenary lectures, focus on the fields of Fish Biology; Aquatic Animal Health and Diseases; Genetics and Breeding; Nutrition & Feeding; Aquatic Animal Farming; Aquaculture Production; Biotechnology and Aquatic Environment Management etc.

These presentations will identify or offer solutions to problems, utilize case studies, identify knowledge gaps or collaboration opportunities, and discuss broader applications and implications of material presented.

Qingdao, the biggest city of Shandong Province, is located in the east part of China. Qingdao is also known for its beautiful coastal scenes and fascinating scenery. Lastly we hope that you could show your enthusiasm and make contributions to this event and enjoy your stay in Qingdao.

Sincerely Yours,

Dr. Xiaodan Mei, Ph.D.
Executive Chair of WCAF-2015
President
BIT Congress Inc.

Contact Us:
Ms. Emma Xiao
Organizing Commission of WCAF-2015
East Area, F11, Building 1,
Dalian Ascendas IT Park,
1 Hui Xian Yuan,
Dalian Hi-tech Industrial Zone,
LN 116025, China
Tel: 0086-411-84575669-859
Fax: 0086-411-84799629
Email: emma@wcmfcon.com
http://www.bitcongress.com/wcaf2015/default.asp

BIT Congress Inc.
Foreign Experts Databank of SAFEA-Dalian Branch

Information Research Center of International Talent, SAFEA

China Council for the Promotion of International Trade Dalian Sub-Council

China Fisheries Association

China Algae Industry Association

China Recreational Angling Association

China Shipowners' Association

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 provided 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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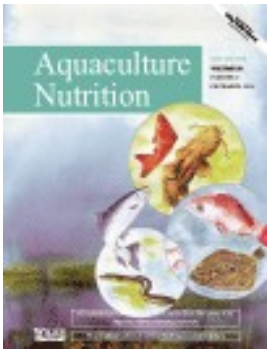

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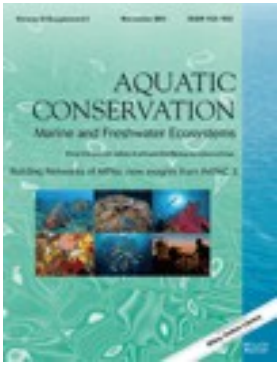

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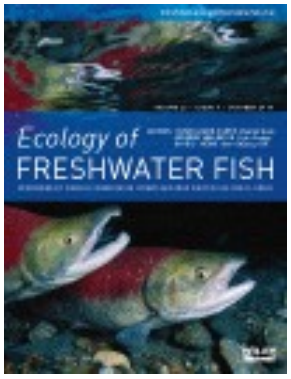

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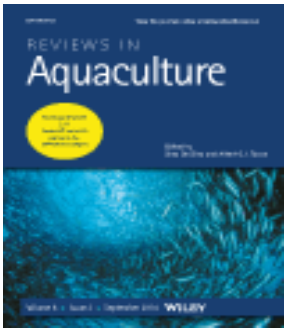

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