



OCTOBER 2020

NEWSLETTER

Sarah Sirica, Quarterly Newsletter Manager | s.m.willarderoh@gmail.com

An Interview with Debra Bourne

Dr Debra Bourne, MA, VetMB, PhD, MRCVS, is the newly selected editor of the Journal of Wildlife Diseases. She is an experienced writer, editor, and researcher, with a prolific and diverse knowledge base. As she settles into this new role, we asked a few questions to get to know more about her:

1. Please tell us about your background in conservation and zoo animal husbandry.

My late father was passionate about animals and natural history. During my teens we lived in an old farmhouse with

5 acres of land, where he built an animal collection that included waterfowl, llamas, lemurs, tapirs, pheasants, finches, deer, cranes, emus, wallabies and a lot more – we kept more than 150 species of mammals and birds (plus a few poison arrow frogs, tortoises and so on), and I

gained a huge amount of experience in husbandry, from feeding and cleaning to catching and handling, enclosure design, incubation and

hand-rearing. By the time I was 15 I was attending UK-level Taxon Advisory Group (TAG) meetings and somewhat later, after an aviculture internship at the International Crane Foundation (ICF) in Wisconsin, I became co-chair of the Crane TAG.

2. How did you transition from the phases of your career and then into the editing world?

I went to veterinary school intending to spend a couple of years in mixed practice after qualifying, to hone my practical skills, then look to move into zoo and wildlife work. However, soon after I graduated,

the Zoological Society of London was looking for a PhD student to investigate an outbreak of toxoplasmosis in wallabies at their Whipsnade Wild Animal Park (where several hundred Bennett's wallabies (*Macropus rufogriseus rufogriseus*) hop around

500 acres). I wasn't particularly interested in toxoplasmosis, but I liked wallabies, having hand-reared one, so I applied, and did a bit of locum



An Interview with Debra Bourne

work and the ICF internship while we were looking for funding. We never got proper funding, but I did it anyway, on a shoestring – including a small grant from the Zebra Foundation for Veterinary Zoological Education (and I'm now a Zebra Foundation Trustee).

Just before I handed in my thesis, I was shown the demonstration version of Wildpro, an electronic encyclopaedia on the health and management of captive and free-living wild animals. Immediately I could see the potential value – a “one-stop shop” where people could go for integrated, properly referenced information. So, I started working for the Wildlife Information Network (WIN), a small not-for-profit organisation. My initial task was to write the grant proposal for funding the first full Wildpro volume, “Waterfowl: health and management”. The volume covered everything from species-specific natural history to pathogens, diseases and treatment, husbandry and wetland management. I spent nearly 18

years working for WIN, writing Wildpro volumes on lagomorphs, elephants, bears, cranes, ferrets, snow leopards, waders, hedgehogs, wildlife casualties, oiled wildlife response, foot-and-mouth disease, West Nile virus, chronic wasting disease, rabies in raccoons, pain management... Unfortunately, development of Wildpro stopped in 2014.

I strongly believe that access to good information is essential in order for people to make better decisions affecting animals in their care – whether that is an individual or a wild population. I thought the skills I had from writing and editing Wildpro would translate to journal editing quite well, so I started looking

for appropriate posts. I ended up spending more than five years editing UK-Vet *Companion Animal*, a continuing professional development journal for small animal veterinarians, plus first assisting with, then taking on the editorship of, UK-Vet *Equine*.

3. When did you become involved with WDA and what do you like most about it?

Being in the UK, I started going to meetings of the British Veterinary Zoological Society (BVZS) while I was a veterinary student. I first attended both the European Wildlife Disease Association and the European Association of Zoo and Wildlife Vets (EAZWV) meetings in 1998 – also the WDA meeting in

Madison, Wisconsin.

I've attended meetings of both the European organisations frequently since that time, if fewer of the international WDA meetings. I've been a member of the EAZWV Infectious Diseases Working Group for 20 years and an Assistant Editor (AE) of the *Journal of Wildlife Diseases* for 10 years.



One of the best things about WDA is the holistic perspective and the wide range of people involved, from a variety of backgrounds – veterinary, biology, wildlife management etc. Many years ago, I read Aldo Leopold's book 'Game Management'. It's humbling to realise that way back in 1933, based on observation over many years, he recognised that: “The role of disease in wildlife conservation has probably been radically underestimated” – but also that: “The main determinants of disease are the environment and the population.” It is that comprehensive, integrated approach that interests me. Great conferences with wonderful people, stimulating presentations and the fantastic auction

An Interview with Debra Bourne

are also good reasons for being involved with WDA. And of course, WDA produces the Journal of Wildlife Diseases.

4. Why did you want to become editor with the Journal of Wildlife Disease?

The JWD has been an important journal for me for decades. I have been reading and citing JWD papers since I did the literature review for my PhD, if not before, and it's the first journal that I referenced in Wildpro (given the reference code 'J1'). I was honoured to be asked to become an AE of JWD in 2010.

When the post of Editor was advertised in late 2019, I knew I had to apply for the job. It's a fantastic opportunity to use my editing skills and generalist background for the benefit of a valuable journal, a great organisation, and everyone reading the journal.

5. What is your vision for the journal's future?

I want the journal's role at the forefront of wildlife health and disease research to be recognised ever more widely. I want the journal to be the first place

that people look for first-rate, reliable information on wildlife health, to help them make informed decisions. I also want us to help people from all geographical regions to publish wildlife disease research and produce the best papers that they can.

6. What is your advice for scientists submitting to be published in the journal?

First, check that your paper is appropriate for the journal. Believe it or not, we still get offered case reports of zoo-kept individual animals. Publishing in the journal uses resources including the volunteered time and effort of the AEs and the peer reviewers, and these resources must be used wisely. It's important for scientists to use appropriate statistics and to read the instructions for authors, to provide their references in the correct format and so on, to avoid wasted effort – including their own.

7. How do you feel the endowment of the journal will affect your time there?

I consider myself incredibly fortunate to be taking on the editorship at this time, when the Dave Jessup JWD Endowment Fund has reached its goal. This funding provides an exciting opportunity to make sure that the journal can further benefit people working in wildlife health and disease worldwide, and in particular to assist WDA members from all the geographical sections. I have lots of ideas, but we can't just leap in and do everything – costs have to be worked out, and there are time and money costs to many of the possibilities. I will explore the ideas with the Editorial Board and WDA Council, to see how we can make best use of the endowment in a sustainable way.



Treasure Oil Spill, Cape Town, 2000 – Debra was in charge of the hydration team and also helped with blood sampling, etc.

69TH ANNUAL - 14TH BIENNIAL JOINT MEETING OF THE
**WILDLIFE DISEASE ASSOCIATION &
EUROPEAN WILDLIFE DISEASE ASSOCIATION**

CUENCA, SPAIN
August 30 – September 3, 2021



JOIN US FOR WILDLIFE HEALTH!!

We're glad to announce you that the University of Castilla-La Mancha will host the 69th WDA / 14th EWDA Joint Conference from August 30 to September 3, 2021, in Cuenca.

Professionals working in any aspect of wildlife health and/or wildlife disease management as well as **students, researchers** or those concerned with the wild-domestic animal interface or the wildlife-human interface are invited to this unique opportunity to share their knowledge.

We also especially encourage students to contribute their work and take the opportunity to share their viewpoints with specialists. Student contributions are assigned space in specific sections and the best oral and poster presentations will be awarded.

For abstract submission guidelines please consult further information at
<http://www.cuenca2020.com/CUENCA2020/abstracts/guidelines>

ABSTRACT IN ANY TOPIC OF WILDLIFE HEALTH WANTED

ABSTRACT SUBMISSION PERIOD STARTS: FEBRUARY 1, 2021

DEADLINE FOR ABSTRACT SUBMISSION: APRIL 18, 2021

Abstracts for both oral and e-poster presentations are now invited on all aspects under the main topic. Scientific advances in the broad topic of wildlife disease management are especially welcome. However, all information on wildlife health and host-pathogen interactions is within the scope of the conference.

The non-exclusive thematic areas to which the submitted scientific studies should add, include:

- 1. Integrated monitoring of wildlife population health and new methods for wildlife health surveillance*
- 2. Incorporating wildlife health into population and cumulative effects models and conservation plans*
- 3. Wildlife disease control and management*
- 4. Infection transmission at the wildlife-livestock-human interface*

69TH ANNUAL - 14TH BIENNIAL JOINT MEETING

5. *Ecosystem health, global change and diseases*
6. *Host-pathogen interactions in wildlife*
7. *Neglected and emerging wildlife diseases*
8. *Molecular epidemiology of wildlife pathogens*
9. *Interactions among pathogens and other wildlife health determinants*
10. *Community engagement in wildlife health promotion and conservation*

Abstracts on other aspects of wildlife health are also welcome!

AND MORE ...!

- WORKSHOPS & SYMPOSIUMS
- PLENARY TOP SCIENTIFIC SPEAKERS
- SCIENTIFIC MEETINGS

- STUDENT CHAPTER MEETINGS
- JWD EDITORIAL BOARD MEETING
- CONFERENCE GREENING ACTIVITIES
- SOCIAL ACTIVITIES
- CULTURAL ACTIVITIES
- ADVENTURE ACTIVITIES
- SCIENTIFIC ACTIVITIES
- MENTORING
- AND OUR TRADITIONAL AUCTION

Find everything about the Conference at:

<http://www.cuenca2020.com/CUENCA2020>

Organizers: Spanish Game Resources Institute (IREC)

Health & Biotechnology (SaBio) Group

Ronda de Toledo, 12; 13071 Ciudad Real, Spain

Contact us at: cuenca2020@viajeseci.es

THE DAVID A. JESSUP JOURNAL OF WILDLIFE DISEASES ENDOWMENT FUND – A BRIEF HISTORY

By David Jessup

Strategic planning efforts as far back as 1987 rated financially ensuring the capability to provide scientific content to the membership, primarily by endowing the publication costs of Journal of Wildlife Diseases, as WDA's highest priority. In part this was the result of WDA finding itself with some unexpected bills, with its only two sources of income, membership dues and author page charges, barely adequate to meet financial obligations. This "highest priority" was subsequently reiterated in other planning efforts, by Council and membership. The question was, how to do it, and also how much would be needed?

Several attempts were made over two decades to find foundations that might want to help with this, but to no avail. But during that time (mid-80's to mid 2000's) WDA consistently increased traditional

revenue, increased membership, kept expenses low, and diversified sources of income (with auctions, member donations and sustaining memberships among others), and invested any surpluses. By 2010, when I took over management of WDA, we had substantial invested funds equal to more than 2 years' operating expenses. On advice from the CEO of the Monterey Bay Foundation, with Council's approval, a JWD Endowment Fund was established, and we began using member and organizational donations, fundraising events (like online auctions), and a portion of the invested surplus beyond one year's operating expenses, to reach WDA's highest goal, the endowment of JWD. The estimated amount needed was \$2.5 million yielding 4-5%/yr. (\$100-125,000). By the end of 2019 we had reached and exceeded

THE DAVID A. JESSUP JOURNAL OF WILDLIFE DISEASES ENDOWMENT FUND – A BRIEF HISTORY

that goal by raising \$3 million. And despite a crazy, crazy year, our invested funds remain at over \$3 million, thanks in large part to our wonderful financial planners, Jacobson and Schmitt Advisors.

This is arguably the 'biggest thing WDA has ever done', at least in a financial sense, and not only allows publication of JWD IN PERPETUITY, but possibly expansion or diversification of ways we provide scientific content. It also decreases reliance on membership dues and author page charges and allows WDA to be able to provide more member benefits without having to raise fees, possibly IN PERPETUITY. In fact, as recently announced, for 2020 WDA has decreased membership fees by 20% across the board to help members impacted by the economic downturn resulting from the pandemic. Other benefits and improvements for authors, members and colleagues are under consideration.

But, achieving 'our highest goal' is more than just 'a goody basket'. It shows that WDA is strong, we can

'keep our eyes on the prize' and not get distracted or discouraged, over a long period of time (a couple of decades). That members and supporters really value who we are, what we do, and will make personal sacrifices and contributions toward common goals. It shows that a very diverse organization, with members from many disciplines, many countries, economic circumstances, and views of conservation, can come together as one to do something good. That kind of faith and solidarity is so rare and so precious, especially in these dark and cynical times. Margaret Meade is credited with saying *"Never doubt that a small group of thoughtful, committed people can change the world; indeed, it's the only thing that ever has."* Congratulations to WDA and all of us.

Finally, I will have to admit, I feel relieved (always leave on a high note!) and fulfilled to have helped guide and facilitate this effort. Council's decision to attach my name to the JWD endowment is a high honor, one that I deeply appreciate. Thank you from the bottom of my heart.

DOLORES GAVIER-WIDÉN RECEIVES THE 2020 WDA ED ADDISON DISTINGUISHED SERVICE AWARD



The Ed Addison Distinguished Service Award is the highest award presented by the Wildlife Disease Association. The purpose of the award is to honor a WDA member of long standing who, by his/her outstanding accomplishments in research, teaching,

and other activities, including participation in WDA affairs, has made a noteworthy contribution to furthering the aims of the Wildlife Disease Association.. The 2020 Ed Addison Distinguished Service Award has gone to Dolores Gavier-Widén.

Dolores joined the WDA in 1992 and quickly became one of WDA's most accomplished and internationally respected members.

Dolores received her DVM at the University of Buenos Aires in 1982, her MS (in Pathology) at University of California at Davis in 1986, and her Ph.D. (Pathology) also at UCD in 1992; that was the year she joined the WDA. Even as a student, Dolores was a champion at organizing wildlife disease meetings and bringing scientists from around the world together for meetings, collaborations on projects, and formal conferences. She has been the organizer, co-organizer, or part of the scientific committee for at least 10 major international conferences held throughout Europe, the US, and South America, including three WDA conferences (two European and one international). She is or has been a member of nine

DOLORES GAVIER-WIDÉN RECEIVES THE 2020 WDA ED ADDISON DISTINGUISHED SERVICE AWARD

international associations related to wildlife diseases and veterinary medicine. In addition, she has been a participant, partner, or project leader for 17 formal national or international research activities related to wildlife diseases. She was an invited expert, advisor, or board or working group member for 18 scientific working groups or commissions, most all international.

Dolores has a profound commitment to mentoring students and scientists as evidenced by her being an external evaluator or opponent, or member of the thesis committee for 11 graduate students and the primary research supervisor or co-supervisor for 10 more.

In 2006, Dolores was elected president of the European Wildlife Disease Association. That same year she began 10 yr. of service on WDA Council, first as the European section president, followed by WDA Member-at-Large, then WDA Vice-President



and, in 2011-2013, as WDA President. But all this did not keep Dolores sufficiently busy, so she (1) and most importantly, raised a family, Alexander, Veronica, and Emelie, with her husband Frederik, and (2), sought funding for her own research as part of 32 different international research groups, as an investigator, project leader, research advisor, or research committee

member. Her research led her to the publication of over 100 peer-reviewed written papers, books, and book chapters, and >150 oral presentations, abstracts, and posters at international conferences, and invited lectures at international meetings. Of special note, Dolores was the lead editor (along with Paul Duff, Anna Meredith, and 55 contributing authors) of “Infectious Diseases of Wild Mammals and Birds in Europe,” the “bible” for students and professionals in wildlife disease science in Europe.

Dolores has continued to lead a distinguished scientific career as both researcher and mentor, and most lately, as the executive manager at the Swedish National Veterinary Institute (SVU) in Uppsala, Sweden. Since 2013 she has been the head of the Department of Pathology and Wildlife Diseases at the SVU.

Each of the accomplishments mentioned here is worthy of a much richer and detailed description but, especially in Dolores’ case, that would require much more than a mention in a newsletter. We look forward to celebrating and recognizing Dolores’ prestigious WDA award at the 2021 WDA international conference. We are indebted to the contributions Dolores has made to advancements in the study of wildlife diseases, the training and mentoring of wildlife disease scientists, and to the world-wide progress and fellowship we have built while working together as a team in the WDA and as wildlife disease biologists throughout the world.

WDA BUSINESS MEETING 2020

On September 3, WDA President Carlos das Neves led the first ever virtual WDA annual business meeting via zoom, during our virtual conference week. This was a new but necessary way to get the job done during this COVID-19 pandemic. Carlos took time to note how we have many members who have been very active in the fight against COVID, and he started off the meeting by mentioning the many hurdles for the planning, then re-planning, of the conference, and the general activities of WDA’s members and sections.

However, thanks to the efforts of council and the WDA membership, day to day business has continued to be successful. We are already an organization that has international ties and is used to communicating at a distance, which has been an advantage during these trying times.

The beginning of the meeting highlighted the work of the council over the last year. In December, they formally approved recognition of the David Jessup JWD Endowment Fund. Also pertaining to the JWD,

WDA BUSINESS MEETING 2020

a new editor has been selected, Debra Bourne, and she has started working with Daniel Mulcahy, past editor, to finalize this transition. Council has also put out a request for a proposal to reduce the paid author charges for JWD submission and publication. This was an issue raised by the futures committee as a means to facilitate and motivate people to publish in our journal.

Council approved a motion for WDA to apply for membership to join the International Union for Conservation of Nature (IUCN), which would give WDA more visual representation globally. As Carlos said, “without healthy animals there will not be much to conserve.” Treasurer Mike Ziccardi represented WDA in an event at the USGS, National Wildlife Health Center in Madison, Wisconsin to discuss establishing wildlife surveillance and monitoring systems.

On the front of our global impact, Carlos thanked everyone for their generosity and effort with contributing to the Australian bushfire crisis. WDA members have also been involved with colleagues in Botswana concerning an elephant mortality event and responded to a request for a challenging wildlife situation in Iran. He stressed that we must “be there” for wildlife as an association.

Treasurer Mike Ziccardi reported that, our funds are in great shape, and that WDA has been having success with endowments and investments. This year’s total income is expected to exceed projected income by 20%. When we have net income, we are applying our strategic approach and will use those excess funds to increase grants for students, and potentially other long lasting investments, the details of which are being worked on by the futures committee.

The Executive Manager report came next from Peri Wolf, who has been rounding out her first full year in this position. She discussed three things council voted on recently. The first was the pandemic relief package, which provides a 20% decrease in membership cost for 2021 to members during the unprecedented economic crisis around the world. WDA is listening to and responding to the challenges of the members.

Secondly, the qualifications for lifetime membership have been altered, decreasing the minimum number of years of membership to five from twenty while maintaining the age requirement of over 65 years of age. Possibly the biggest news was that three endowment goals have been met- the JWD, the Tom and Beth Award and the Carlton M. Herman Founder’s Fund. She thanked everyone profusely and praised the generosity of WDA members. News about each of these endowments and the future of the awards will be in this and subsequent newsletters.

In the next three months both the WDA and JWD website will move to new platforms. A key feature for both will be a more modern look and a responsive design which automatically scales the image to the screen of the device you’re using. For the WDA website a group of five members all with website design experience, have been regularly meeting with Allen Press to streamline the look of the new WDA website.

In the vein of virtual connectivity, our online crowdfunding grant challenges went live on September 1st, through the Experiment platform. Peri reported that this has been a new and effective way of giving voice to a wide range of topics and species, with representation from a number of different countries. And we expect continued success in 2020 as with the challenge grants conducted in 2018 and 2019.

Lastly from Peri, there are some changes in the works with our cooperative agreement with the USDA/APHIS Wildlife Services which for a number of years has donated ten thousand dollars to WDA yearly, half of which is allocated to the annual conference, and half of which has historically gone to support the worldwide distribution of JWD. Now that the journal is endowed, USDA want to reroute that half, toward efforts and mutual goals of both our organizations. We settled on disease surveillance training for students and early career scientists, with a focus on the wildlife-livestock interface, and diseases of zoonotic importance, as being consistent with both organizational missions. Beginning in

WDA BUSINESS MEETING 2020

2021, they will be putting together a training course to that effect, which will likely be associated with the annual meeting.

Our total membership currently stands at 1443 members, with representation from 67 different countries. Peri emphasized meeting what our members and prospective members need from the organization, is key. We need everyone to help promote membership in WDA. On our website, there is an amazing short promotional video made by the Wildlife Veterinary Section and power point slides available which can be added to member's talks at any time.

In the meeting's next segment, Vice President Andrew Peters went over the Futures Committee report, and explained the goals of strategic planning as a means of shaping our future as an organization. Briefly, we want to grow our impact, and grow our family, while making sure our brand and organization structure maintain a fit for purpose design. This committee has been utilizing the results from a member-wide survey which 35-40% of WDA members responded to. They are currently identifying the key goals for WDA over the next 5-10 years and how to achieve and operationalize them. If you would like to be involved, he encouraged reaching out.

As the business meeting wrapped, the happy business of recognizing our outstanding members was completed. The student awards were mentioned first, then the Small Grants Committee, which funded two applications: one by Maria Forzan, "Dissemination of the Strategic Plan of the North American *Batrachochytrium salamandrivorans* Task Force Across Multiple Media Platforms", and one by Debra Miller, "Amphibian Emerging Infectious Diseases Brochure". The WVS also awarded a research grant to Sarah Wahltinez and Nicole Stacy for their project "Using Optimized Histology to Investigate Tissue Responses to Stressors in the Ochre Sea Star (*Pisaster ochraceus*)".

The Student Activities Committee travel grants awarded this year will have the funds available for next year's in-person conference in Cuenca. Last but certainly not least were the Ed Addison Award received by Dolores Gavier-Widén, and the Tom Thorne and Beth Williams Memorial Award, received by Richard Kock. Although clearly surprised at winning the award, Richard quickly rebounded into speaker mode delivering a rousing talk about the state of wildlife disease, and progress we have made that he has observed through the years.

RICHARD KOCK RECEIVES THE WDA-AAWV TOM THORNE AND BETH WILLIAMS MEMORIAL AWARD

By David Jessup

Richard is currently on the faculty of the Royal Veterinary College. I have known Richard since 1983 as a colleague and friend. I'll never forget the first time I watched him in action give a quiet but firm dressing down to an animal dealer who had sent known TB positive elephants to the Zoological Society of London (ZSL), Whipsnade Zoo. No dramatics, no fireworks, but very clear communication and the dealer immediately made good, and the situation was resolved. Both Beth and Tom had that ability, which I admire, to confront important issues and problems, personally, but without the drama

some of us seem to find necessary.

Richard was born in Zimbabwe, but his family moved to South Africa early in life. He attended secondary school in England, then Cambridge University Veterinary School, and was appointed as staff veterinarian at Whipsnade in 1983. Like his brother Mike, he had



RICHARD KOCK RECEIVES WDA-AAWV TOM THORNE AND BETH WILLIAMS MEMORIAL AWARD

a very strong interest in free-ranging wildlife and the broader applications of veterinary medicine outside of normal practice boundaries. While with ZSL he helped develop one of the very early field courses to train veterinarians for wildlife work, and researched and published on several advances in anaesthesia, including a new reversal for xylazine and medetomidine, applicable to captive and free-ranging wild ungulates.

In 1991 ZSL sent Richard to Kenya to establish a new wildlife health branch as part of the new Kenya Wildlife Service (KWS), a visionary para-governmental organization. He obtained a pilot's license and did a good deal of difficult and dangerous field work, earning his chops and the respect of his older established colleagues. I know this because I once flew with him from Nairobi to Lewa Downs to treat a rhino that had been gored by an elephant.

Under the supervision of Richard Leaky, he built a world class veterinary service program while training indigenous Kenyans to staff it. As Chief Veterinarian for KWS he developed a strong wildlife veterinary and health program that was beyond anything available outside South Africa. One problem he faced was a 'brain drain'. The brightest and most capable young colleagues he trained were quickly offered much higher paying position in Middle Eastern countries and elsewhere. He responded simply by training more young colleagues until there were plenty to go around.

The program he started and ran for 8 years, now has 12 veterinarians (and other staff), and provides mobile veterinary services for a large country dealing with wildlife health and disease, human conflict, and animal welfare issues. He is still an esteemed alumnus of that program and regularly sought for his views and wisdom. The vast majority of the staff is Kenyan born and this unit is a model looked up to by many African nations. This achievement alone could be worth the Tom Thorne and Beth Williams Memorial Award as an "exemplary contribution to wildlife management policy implementation".

Richard's next decade was spent working with the African Union Inter-African Bureau of Animal Resources (AU IBAR), with responsibility for dealing with wildlife-livestock diseases within and between member nations of Eastern, Central and Western Africa. One of the most serious of these was Rinderpest. As may be remembered, Rinderpest, a morbillivirus related to human measles and canine distemper, entered Africa in the late 19th century and caused such severe losses in the very wide array of African wild species that it changed the ecology of much of the continent. It also made livestock raising risky, exacerbated wildlife-livestock conflict, and greatly inhibited international trade as a source of revenue. Some early WDA legends, like Lars Karstad, spent time in East Africa working on it in the 1960's and 70's.

A massive international campaign to limit or eliminate Rinderpest from Africa in the 1980's failed. A new campaign with improved and stabilized vaccines was begun around the turn of the century and appeared to be making great progress. But, despite strong and sustained efforts, small outbreaks kept occurring and the remaining source of virus was not identified. Richard was responsible for recognising the subtle signs of rinderpest in wildebeest and, at a time when the campaign was at risk of failure, showed that these animals were indeed the likely remaining carriers. The eliminations efforts he then contributed to and helped supervise were able to eradicate Rinderpest, not just from Kenya, or East Africa, but from all of Africa, and ostensibly from the World.

The President of Kenya dedicated an enormous bronze statue of a Cape Buffalo in Nairobi to commemorate a signal achievement in wildlife/livestock health and Richard was awarded the FAO Bronze Medal for his contributions to global rinderpest eradication. Arguably this is one of the greatest wildlife health stories, one of the greatest wildlife/livestock veterinary achievements in the early part of the 21st century. Arguably one of the very best examples of "combining wildlife disease research with wildlife management policy

RICHARD KOCK RECEIVES WDA-AAWV TOM THORNE AND BETH WILLIAMS MEMORIAL AWARD

implementation" and of "elucidating particularly significant problems in wildlife health". These being criteria for the Thorne – Williams award.

But it didn't end there. Richard and his colleagues did such a good job collecting data that he was able to organize it, further analyse it, and form it into a thesis that resulted in his receipt of a doctorate from University of Cambridge in 2011. Thus, those lessons learned in the Rinderpest eradication campaign will remain available for researchers and agencies in perpetuity.

Richard returned to England in 2006 and was appointed to lead ZSL's global wildlife health programmes. He led the development of a new master's Course in One Health as part of the ZSL One Health Initiative. From 2015 through the present Dr. Kock has been leading investigations into massive saiga antelope die offs in Mongolia and Kazakhstan. Over 80% of saiga in Kazakhstan died in 2015, garnering world attention. They identified a *Pasteurella* and climate/weather factors as the likely causative agents. In 2016 Richard and colleagues were able to show that a huge Saiga mortality event in Mongolia was due to the small ruminant morbillivirus, PPR. And further, that gazelle also died of PPR, and that existing livestock vaccination programs were inadequate or poorly managed. As the work was done in collaboration with in-country veterinary and health staff, the findings are spurring progress. This work is another great example of "elucidating particularly significant problems in wildlife health", as well as an "exemplary contribution to wildlife management policy implementation".

Dr. Kock has been a strong member of WDA for over 25 years (with a few lapses). He had a key role in the initial establishment of the Africa Mid-East Section in 2002, serving as its Treasurer for 4 years, and helping to organize several regional meetings. He was very helpful in the re-establishment of that Section in 2016, having been a mentor and colleague of many current Western, Central and Eastern African nation wildlife conservation leaders.

He is highly respected in EWDA and has provided talks at several EWDA Student Workshops. Richard was elected as a Member-at-Large of WDA Council in 2016. He was an active member of Council for 3 years and of the WDA Futures Committee for 2 ½ years.



Richard Kock and Dave Jessup in 2017 following the WDA conference banquet in Mexico, at La Revolucion bar getting into the spirit of the place, photo credit Tom DeLiberto

The Thorne-Williams award serves as an opportunity to recognize the best among us. Dr. Richard Kock is certainly one of those. Arguably, he is as responsible as any one person for the world eradication of rinderpest, for the establishment of a world class wildlife veterinary service in Kenya, and for directing field investigations of massive die-offs in endangered Asian wild ungulates. Any one of these accomplishments alone is worthy of consideration for the Thorne-Williams Memorial Award. But taken together, I think it would be hard to find someone more deserving of this recognition.

The fact that WDA will be co-convening with EWDA in Cuenca, Spain in 2021, and that Richards wife and friends/colleagues will likely be there, adds to the appropriateness of his being presented the award at that time. And, in all that he has accomplished, Richard Kock has remained an easy going, humorous, gentlemanly, and sincere individual who cares deeply about wildlife, human wellbeing, conservation, and the future of the world.

WDA Wildlife Veterinary Section

The Wildlife Veterinary Section of WDA had their annual business meeting on October 26th at 4pm via Zoom. The meeting included a discussion of some great new initiatives and revising section bylaws. The current bylaws are as follows:

- To enhance the contribution of veterinary medicine to the conservation and welfare of the wildlife resource.
- To promote and encourage the utilization of veterinarians in the field of wildlife resource management and research.
- To stress the importance of the interrelationships of man, domestic animals, and wildlife as reservoirs of disease.
- To promote and encourage a philosophy of animal population management and preventive medicine as it relates to free-ranging species.
- To encourage the recognition of disease syndromes as potentially influenced by habitat succession, alteration, and pollution.
- To encourage cooperative effort among resource management professionals and wildlife veterinarians.

- To educate and gain rapport with governmental agencies and wildlife resource interest groups about the importance of wildlife preventive medicine and disease management, and the support provided by wildlife veterinarians in relation to the wildlife resource and domestic species.

- To encourage an increased emphasis in colleges of veterinary medicine relative to management and preventative medicine of free-ranging species and to provide for mentorship of students interested in the field of wildlife veterinary medicine.

- To help establish and work for continuing education programs for wildlife veterinarians.

The Wildlife Veterinary Section had elections this summer and has a new suite of officers:

- a. Sonia Hernandez-Chair
- b. Anne Justice-Allen-Past Chair
- c. Julia Burco-Treasurer
- d. Sandie Black-Secretary
- e. Michelle Kneeland-Communications
- f. Daniella Guzman-Student rep



Information Committee Update

The Wildlife Disease Association's Information Committee is responsible for enhancing WDA's electronic presence, including the website, newsletter, and social media. Our social media presence currently includes our public Facebook page and private group, Twitter, and members-only Google Group. If you're not already following us, please find us on Twitter and Facebook. We aim to provide [Twitter](#) updates daily and [Facebook](#) updates on our newly created public page several times a week. Volunteers keep these accounts active and increase the public presence of our organization! We could always benefit from more volunteers to help moderate groups and post updates, and it's a great way to keep up to date on wildlife

disease news and opportunities. If you'd like to join us, please email wdainfocommittee@gmail.com.

One of the areas we'd like to branch out into is Instagram, and we need your help. Our website and social media presence would greatly benefit from photos of the wonderful wildlife everyone studies, and of our hard-working members in action. We'd love to feature our members and their study species on the WDA and JWD websites, and on a new Instagram page. We can also use your photos and a mention to post your upcoming JWD publications on Twitter. Any photos you submit will be credited to you. Please email photos to: exec.manager@wildlifedisease.org.

Student Activities Committee (SAC)

Student newsletter October 2020, Student corner

Dear worldwide student community,

We hope your academic year and wildlife projects are not suffering too much from this worldwide crisis. The world will need you more than ever!

Meanwhile, the SAC is happy to be back on track with several new projects! Some are already shared in this newsletter, but more is coming...

In order to promote student membership and creation of student chapters in the Asian Pacific section, the Student Activities Committee decided to offer free memberships to selected applicants. This is a one year membership giving access to all the member benefits as open access to the Journal of

Wildlife Diseases, conference recordings, discount for the annual meeting,... but even more the opportunity to join a great community and meet a bunch of other wildlife professionals and students sharing the same passion.

The form will be available online, on our website (in the student section) and shared on social media. Applications are **only** meant to be open to **Asian Pacific students!** The deadline to apply is 31st October. We wish you good luck and we are looking forward to receiving your applications.



Asian Pacific Student membership grant

Our mission is to acquire, disseminate and apply knowledge of the health and diseases of wild animals in relation to their biology, conservation and interactions with human and domestic animals

To promote student memberships in the Asian Pacific section, the WDA Student Activities Committee is now accepting applications for student membership grants

FORM on www.wildlivedisease.org/student section

Deadline for applications: 31st October

The banner features a photograph of an elephant on the left, the WDA logo (a globe with various animals) in the center, and a stylized 'OPEN' sign with radiating lines on the right. Below the main text, there is a small illustration of a book and a logo for the Wildlife Disease Association (WDA) featuring a deer and a fish.

In September, the Southern African Student chapter organized an amazing poster competition for the world rabies day! Here are a few words about it and a great artwork made by one of our student members. A future online event is also advertised:

End Rabies: Collaborate, Vaccinate

World Rabies Day is observed every year on 28 September, to help raise awareness about rabies prevention and the impact of the disease on both humans and animals.

WDA student Dhawal Anand (Bsc Biotechnology) from the Institution Lyallpur Khalsa College Jalandhar Punjab, India, created a beautiful awareness poster for this day. This year's theme was 'End Rabies: Collaborate, Vaccinate'!

Rabies is a viral disease that is transmitted through the saliva or nervous system tissues of an infected mammal to another mammal or human. It is the deadliest disease on earth with a 99.9% fatality rate. Estimates suggest that over 5.5 billion people live with the daily risk of rabies, with 59,000 deaths every year. Over 95% of these deaths are in Africa

Student Activities Committee (SAC)

and Asia, with the majority occurring from rabid dog bites. Around half of the people who die are children under 15 years of age. Globally, the economic burden of dog-mediated rabies is estimated at US\$ 8.6 billion per year. Vaccinating dogs is the most cost-effective strategy for preventing rabies in people.



To mark World Rabies Day 2020, the Southern Africa WDA student chapter (SAWDASC) launched an online competition where African students were invited to submit a short awareness video or poster. The aim of this competition was to raise awareness about the devastation still caused by rabies, especially in neglected communities, and the global goal to end dog-mediated rabies deaths by 2030.

Posters and videos were judged according to their composition, relevance to the theme (end rabies: collaborate, vaccinate) and message. We would like to

thank Dr. Stephen Chege (WDA-AME Section Chair), Prof. Michele Miller (SAWDASC Faculty Advisor), Dr. Anna Haw (SAWDASC Student Board Advisor) and Dr. Eduard Roos (WDA-AME Section Student Representative) for their support in organising this initiative and for judging the competition.

We were impressed by the many excellent posters and videos we received from the extraordinarily talented students across Africa. The winners of the competition were announced at the WDA-AME End Rabies online lecture event held on October 11th. The event was organised by the SAWDASC and the Zoo and Wildlife Medicine Study Group. We want to thank Dr. Grace Kia (Ahmadu Bello University, Zaria, Nigeria) and Dr. Katja Koeppel (University of Pretoria, South Africa) for serving as speakers and inspiring us by giving insight into the work they have been doing to end rabies.

Congratulations to Joseph Pwajok, Mubarak Aliyu, Zakariya Maryam, Jacob Mbogo, Ookonkwo Ikechukwu Christain, Brenda Kimetto, David Abiayi, Agunbiade Olatunbosun Joseph, Hannah Loni, Muthoni Winnie, Folajimi Shorunke, Torkuma Cosmas and Dhawal Anand for your outstanding contributions to the WDA-AME World Rabies Day 2020 competition.

Congratulations to the winners:

VIDEO

- 1st) [Zakariya Maryam, University of Ilorin, Nigeria.](#)
- 2nd) [Shorunke Folajimi, Ahmadu Bello University Zaria, Nigeria.](#)
- 3rd) [Joseph Pwajok, Federal University of Agriculture Makurdi, Nigeria.](#)

POSTER

- 1st) Brenda Kimetto, Egerton University, Kenya.
- 2nd) Muthoni Winnie, Karatina University, Kenya.
- 3rd) Hannah Loni, Ahmadu Bello University Zaria, Nigeria.
- 3rd) Jacob Mbogo, University of Nairobi, Kenya

Best.

SAWDAS

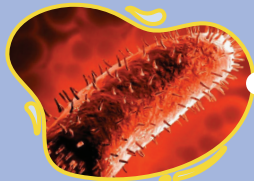
END RABIES: COLLABORATE, VACCINATE!

While Rabies is 100% Preventable, 60,000 People Die Globally & 2,000 Annually in Kenya



In Africa, dogs are important because they provide security and companionship.

However, dogs are the major transmitters of Rabies. Humans get it through a bite / scratch from a rabid dog.



Rabies treatment is very expensive and extreme and if not treated promptly is fatal.

Therefore, vaccinate your dogs to prevent rabies and save lives!



Vets can collaborate with stakeholders (Medical Department, Public Health Department, NGOs, Environmentalists, etc.) to hold mass vaccinations in their areas as we move to eradicate Rabies

Prevention is Better Than Cure

Zoonotic Parasites and Vector-borne Diseases of Reptiles

Presenter: Dr. Jairo Mendoza

Dr. Mendoza graduated in Veterinary Medicine (La Salle University in Bogotá, Colombia) and has a MSc. from the University of São Paulo, Brazil, and a Ph.D. in "Experimental Epidemiology Applied to Zoonosis" from the same university. Currently he is a fellow researcher in "Animal Health and Zoonosis" at the Department of Veterinary Medicine of the University of Bari. He has experience in herpetological medicine, including epidemiology of infectious and parasitic diseases, anesthesia of ectothermic animals, venomous animal handling, and wildlife capture. He also participated in the conception, research and development of several epidemiological studies of parasites and vector-borne diseases of reptile and amphibian hosts in South America and Europe, including species of zoonotic concern. He is currently working on zoonotic parasites and pathogens associated with reptiles in Italy, emphasizing on vector-borne diseases as leishmaniasis, Lyme disease, and Mediterranean spotted fever.

Date: Sunday, October 25th, 2020
Time: 8:30 am New York (UTC -4)

This is an online free event by:



JOURNAL CLUB

We go further with the great news with the announcement of the next Journal club organized by the Southern African Student Chapter and the Zoo and Wildlife Medicine Study Group. Additionally, in the very close future, the SAC will collaborate with the ZWMSG in order to provide you regular webinars but also a free platform to organize events and associated online content as recordings, round tables, ... Please stay tuned!

If you're part of a student chapter and wish to organize a webinar, please don't hesitate to contact us!

(ioannidis.marianthi@gmail.com)



MEET THE TEAM

As we started a new year with you, we thought it would be a good idea to finally introduce the SAC team hidden behind those student activities and management:

Shelli Dubai, USA (SAC officer)



Hello. I have been a member of WDA since I began graduate school at the University of Wyoming in 1994. I fondly remember attending the WDA meetings in East Lansing, MI and Fairbanks, AK as a graduate student (despite being terrified to present my research). At those meetings, it became clear to me that WDA is a family and

I wanted to be part of this optional family. Since 2005, I have worked as a professor of wildlife at the University of Wisconsin-Stevens Point, a small Natural Resources focused University. I investigate wildlife health phenomena with undergraduates and master's students. My research interests focus on how diseases are transmitted among animals in the wild. I'm holding a red-shouldered hawk nestling in the photo below. I have thoroughly enjoyed serving on the Information Committee (twice Chair), Promotions Committee, Membership Committee (once Chair) and Student Activities Committee (SAC) for WDA. In 2019, along with other SAC members, I helped plan the student-mentor mixer for the California WDA meeting. I am excited to attend the 2021 meeting in Spain. I am working with fellow WDA members in Madison, WI to plan the 2022 WDA meeting as well.

Marco Vecchiato, Italy (SAC officer and chair of the EWDA SC)

Italian veterinarian serving as Chair of the EWDA Student Chapter, currently working in a first-opinion small animal practice and part-time master's student in Conservation Medicine at the University of Edinburgh. Experiences in wildlife medicine and conservation include a participation in several



fieldwork research projects of the Latin America Program in Argentina, an internship at the RSPCA wildlife rehabilitation center and a collaboration with Disease Risk Analysis and Health Surveillance team at Zoological Society of London.

Anna Baauw, Belgium (SAC officer and past chair of the EWDA)



I'm a Dutch veterinarian and ecologist, recently graduated from Ghent University (Belgium). My passion lies in combining these two fields in wildlife conservation. During the past few years, I've enjoyed a number wildlife-oriented externships, in free-ranging conditions, zoos, and rescue centers, mostly focusing on pangolin conservation. I've been active within EWDA as a

country student representative for Belgium, and as chair and advisor of the Student Chapter board. As a general member in the SAC, I hope to contribute to creating and improving opportunities for students within the WDA wherever we can.

Florina Tseng, USA (SAC officer)



I am the director the wildlife clinic at the Cummings School of Veterinary Medicine at Tufts University. I was always interested in animal behavior, biology, and conservation issues. Wildlife rehabilitation medicine has allowed me to combine all of my interests and pass that knowledge on to a younger generation of

veterinarians. I graduated from Cornell vet school with an interest in wildlife medicine and went into small animal/exotics practice while working with wildlife on the side. Eventually, I completed an internship at the Wildlife Center of Virginia, was the staff veterinarian at PAWS Wildlife Center near Seattle, WA and got involved in oil spill response. I moved down to the SF Bay Area to become staff veterinarian and research director at International Bird Rescue and worked closely with others in developing the Oiled Wildlife Care Network. I've been at Tufts for the past 20 years!

MEET THE TEAM

Camilla Smyth, South Africa (SAC officer and Southern Africa SC officer)

Hi, my name is Camilla and I've been an animal and nature enthusiast ever since I can remember. I'm from South Africa but moved to Canada with my family when I was young, so I spent most of my school years there, but I came back to South Africa to study after finishing high school. I did my undergraduate degree in applied biology and genetics at the University of Cape Town, and I've recently completed an honours degree in exercise science, also at the University of Cape Town. I'm very interested in wildlife stress physiology and the effects of climate change on habitat suitability for different species. I'm planning to do a master's degree in the conservation biology field, with a focus on large mammals.



Marianthi Ioannidis, The Netherlands (chair of the SAC and student rep at Council)

Hi, I'm a Belgian vet graduated in 2018 and currently doing an anatomic pathology residency at the university of Utrecht. I've been invested in the WDA since 2017 now and started as a country rep for Belgium. My interest for our association becomes every year bigger and, thanks to this amazing team, we are able to hopefully give you a good support and organize grants for you. As everybody here, I love wildlife and I'm lucky to have a lot of wildlife necropsies at my workplace even though time for research projects is limited. I'm currently working on a small research project to investigate the causes of death in Harbor porpoise neonates. I hope to continue contributing to our student section and more specifically to meet you in our future meetings!



Stuart Patterson, UK (SAC officer)



My PhD work fieldwork was undertaken in the Kalahari Desert of South Africa at the Kalahari Meerkat Project. Here I looked at targeting individuals for vaccination based upon their social position. I was interested in whether by targeting important individuals in the transmission network, disease levels could be controlled more efficiently than with blanket vaccination. I'm currently a lecturer in wild animal health and the course director for the Masters programmes in Wild Animal Health and Biology at the RVC as well as being the pathway leader for the MSci in Wild Animal Biology. My main interests are in the relevance of disease processes to conservation, and how this changes as existing populations become more fragmented.

Catharina Vendl, Australia (SAC officer and past chair of the SAC)



I'm a German veterinarian who just finished a PhD about the respiratory microbiome of humpback whales and the impact on their migration, in Australia at the university of Sydney. I also already took part in other research projects like methane production in ruminants, like kangaroos and how the DNA from dead bacteria can influence the process. I'm also the past chair of the Student Activities Committee.

Marianthi Ioannidis, for the SAC



The National Wildlife Rehabilitators Association is now calling for student papers. The winning student will be awarded free registration to the conference, free attendance to the banquet, and a stipend of \$1000 toward travel and lodging expenses. Follow the link for more details:

https://www.nwrawildlife.org/page/Hiestand_Scholarship

Quarterly Wildlife Mortality Report

October 2020

Written and compiled by members of the U.S. Geological Survey's National Wildlife Health Center.

Rabbit Hemorrhagic Disease Update

A large-scale outbreak of rabbit hemorrhagic disease (RHD), caused by rabbit hemorrhagic disease virus 2 (RHDV2), involving both domestic and wild lagomorphs, began in the spring of 2020 in the southwestern United States and adjacent northwestern Mexico. As of September 2020, RHDV2 has been confirmed in wild black-tailed jackrabbits (*Lepus californicus*), antelope jackrabbits (*L. alleni*), desert cottontails (*Sylvilagus audubonii*), and mountain cottontails (*S. nuttallii*) in the states of Arizona, California, Colorado, Nevada, New Mexico, Texas, and Utah. For up to-date, continental-scale information on the RHDV2 event in wild lagomorphs, please visit the Wildlife Health Information Sharing Partnership-event reporting system ([WHISPers](#)).

RHDV2 is categorized by the U.S. Department of Agriculture (USDA) as both a Foreign Animal Disease ([FAD](#)) and a Notifiable Lagomorph Disease in the National List of Reportable Animal Diseases ([NLRAD](#)). Recently, USDA determined that RHDV2 outbreaks in some southwestern states and Washington state have reached “stable” status and has consequently disseminated virology testing procedures for RHDV2 to be conducted in additional laboratories. Specifically, the U.S. Geological Survey's (USGS) National Wildlife Health Center ([NWHC](#)) and the Southeastern Cooperative Wildlife Disease Study ([SCWDS](#)) have been designated as primary laboratories for testing wild rabbits for RHDV2 in support of state, federal, and tribal wildlife management agencies.

NWHC has developed three overarching goals for RHDV2 response that align with our priority to assist state, federal, and tribal partners with their management response: (1) inform situational awareness, (2) mobilize knowledge, and (3) assess potential population-level impacts of this disease. To inform situational awareness we will provide diagnostic services to state, federal, and tribal natural resource management

partners to document both the (a) geographic and (b) host range of RHDV2. Data will be managed and served in [WHISPers](#). Based on the above goals, NWHC has released [submission guidelines for RHDV2 surveillance](#), provided guidance in a recent [Wildlife Health Bulletin](#), and released “[A Brief Overview of Rabbit Survey Methodology](#)” to assist partners in their efforts to document the distribution and abundance of lagomorphs in their jurisdictions. For more information, contact Bryan Richards, brichards@usgs.gov.



Figure caption: Distribution of RHDV2 in wild Lagomorphs in North America, September 2020, as depicted in the Wildlife Health Information Sharing Partnership – event reporting system (WHISPers).

Using Genetic Barcodes to Identify Bat Species

Conservation of bat species has become a priority in many areas of the United States due to threats such as habitat destruction, human disturbance to cave environments, the building of wind turbines, and the spread of the fungal disease white-nose syndrome. Bat species are typically identified based on morphological characteristics, but this is particularly difficult for the genus *Myotis*. Although genetic barcodes can also be used to identify bats to the species level, for many *Myotis* bats, the portion of the DNA typically used as a genetic barcode does not accurately distinguish some species.

Quarterly Wildlife Mortality Report

The U.S. Geological Survey's (USGS) National Wildlife Health Center (NWHC) has been working to identify novel DNA barcodes for speciating bats and has identified genetic

markers that can distinguish *Myotis* species that were previously difficult to separate on the basis of morphological characteristics or traditional DNA barcodes. We are currently optimizing procedures, building a genetic library, and developing protocols that can be shared in the future with other laboratories interested in using genetic-based identification techniques for bats. Results of testing museum specimens and specimens collected in the field by bat biologists indicated that even experts sometimes misidentify some species.

To date, the methods we have developed have been used [to confirm white-nose syndrome for the first time in the fringed bat \(*Myotis thysanodes*\)](#) from a specimen that was in too poor condition to be identified on the basis of morphological characteristics. Our methods have helped discover new hibernation localities for the federally-endangered Indiana bat (*M. sodalis*) and northern long-eared bat (*M. septentrionalis*) by correcting misidentifications made in the field. We are also in the



Photo caption: Fringed bat (*Myotis thysanodes*). Genetic barcoding techniques were used to confirm white-nose syndrome for the first time in this species.

process of using genetic markers to better understand which bat species are susceptible to white-nose syndrome. For more information, contact Jeff Lorch, jlorch@usgs.gov.

***Batrachochytrium salamandrivorans* (Bsal) Surveillance Published**

A collaborative team of over 35 researchers led by the U.S. Geological Survey's (USGS) Amphibian Research and Monitoring Initiative ([ARMI](#)) and the USGS National Wildlife Health Center ([NWHC](#)) has found no evidence of *Batrachochytrium salamandrivorans* (Bsal) across the United States and one site in Mexico. The results of this study, published on August 3, 2020, in [Scientific Reports](#), found no evidence of Bsal in over 11,000 collected skin swabs. These findings suggest that if Bsal does occur in the U.S., it is likely to occur only rarely in the high-risk areas of North America that were sampled. Bsal is causing devastating mortality of salamanders in Europe and Bsal continues to represent a high risk to amphibians in the U.S. because North America is a global hotspot for salamander diversity, is well connected in the global pet trade, and has suitable environmental conditions for Bsal transmission in wild habitats. While these surveillance results increase confidence that Bsal is not currently present in North America, they provide only a single observation of the state of occurrence of Bsal in the U.S., and risk of introducing an infected individual or material to the wild still exists. The presence of Bsal in potential introduction sources, including captive amphibians and imported captive species, has not been characterized. Thus, ongoing management actions and surveillance are needed to continue to manage the Bsal risk. For more information, contact Dan Grear, dgrear@usgs.gov.

References

- Richgels KLD, Russell RE, Adams MJ, White CL, Campbell Grant EH. 2016. Spatial variation in risk and consequence of *Batrachochytrium salamandrivorans* introduction in the USA. Royal Society Open Science 3(2). <https://doi.org/10.1098/rsos.150616>.
- Waddle JH, Grear DA, Mosher BA, Campbell Grant EH, Adams MJ, Backlin AR, Barichivich WJ, Brand AB, Bucciarelli GM, Calhoun DL, Chestnut T, Davenport JM, Dietrich AE, Fisher RN, Glorioso BM, Halstead BJ, Hayes MP, Honeycutt RK, Hossack BR, Kleeman PM, Lemos-Espinal JA, Lorch JM, McCreary B, Muths E, Pearl CA, Richgels KLD, Robinson CW, Roth MF, Rowe JC, Sadinski W, Sigafus BH, Stasiak I, Sweet S, Walls SC, Watkins-Colwell GJ, White CL, Williams LA, Winzeler ME. 2020. *Batrachochytrium salamandrivorans* (Bsal) not detected in an intensive survey of wild North American amphibians. *Scientific Reports*, 10, 13012 <https://doi.org/10.1038/s41598-020-69486-x>.

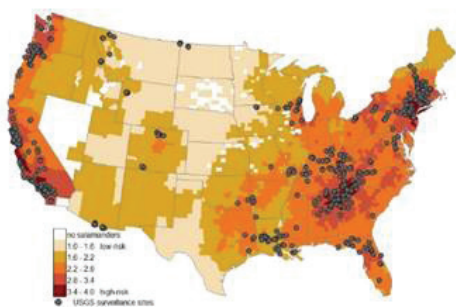


Figure caption: Bsal risk scores in U.S. counties from Richgels et al. (2016) risk analysis, overlaid with sampling locations of the intensive USGS Bsal surveillance effort. Bsal was not detected in over 11,000 samples collected from these sites.

Quarterly Wildlife Mortality Report

For additional information on the USGS National Wildlife Health Center see the following links:

- Main website: www.usgs.gov/nwhc.
- Disease Investigation Services: www.usgs.gov/nwhc/services.
- Report Mortality Events and Submit Specimens: www.usgs.gov/NWHC/submit.

To view, search, and download historic and ongoing wildlife morbidity and mortality event records nationwide visit the Wildlife Health Information Sharing Partnership event reporting system (WHISPer) online database: <http://whispers.usgs.gov/>