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Newsletter



October 2017

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Going Ape: A Summer With Gorilla Doctors

Marlene Haggblade

UC Davis School of Veterinary Medicine

I always forget how much I feel at home in Africa. I love the sounds of the birds, the colors of the kitenge fabric, the thrilling, constantly negotiable rules of the road, and the enormous smiles. As I got off the plane in Kigali, Rwanda last summer, I was immediately surrounded by vegetation I hadn't seen since I was a tiny tot chasing chameleons around our backyard in Madagascar. It had been three years since I had last set foot on African soil as a visitor, and 10 years since I had lived in sub-Saharan Africa as a permanent resident. The familiarities of my youth enveloped me.

During the summer of 2016 (between my first and second year of veterinary school at UC Davis) I had the pleasure of conducting a Students Training in Advanced Research (STAR) project with [Gorilla Doctors](#), a partnership between the non-profit Mountain Gorilla Veterinary Project and the Karen C. Drayer Wildlife Health Center at UC Davis. Gorilla Doctors' headquarters is located in Ruhengeri, Rwanda - a small city nestled at the base of a humbling volcano chain. In putting together my research project, I lucked out with great mentorship. My advisors at UC Davis, the indefatigable Drs. Kirsten Gilardi and Woutrina Smith, are some of the most brilliant

women I've ever worked with. They have more letters after their names than I have in my name – I kid you not. And Drs. Joost Philippa (former regional veterinary coordinator for Gorilla Doctors) and Jean Bosco Noheri (fabulous Gorilla Doctors field veterinarian) are equally phenomenal veterinarians and humans.



Mountain gorillas are one of the most critically endangered great apes, with only two isolated populations remaining worldwide, one in the Virunga Massif straddling the Rwanda, Uganda, and Democratic Republic of Congo borders, and the other in Bwindi Impenetrable National Park in Uganda. In the early 1980s, mountain gorilla numbers fell to an all-time low – only 250 individuals. While not typically poached for their meat, gorillas face a variety of other problems: habitat encroachment due to subsistence farming, residual impact from political strife, potential exposure and transmission of human and livestock disease, and trauma from snares set for other wildlife. In response to the precariously low population numbers, local governments and international agencies have worked together to promote ecotourism, reform local education programs, increase law enforcement within forest grounds, and establish an innovative wildlife veterinary program – Gorilla Doctors. As a result of these efforts, the total mountain gorilla population has since risen to almost 900 animals today!

I thoroughly enjoyed my summer working with Gorilla Doctors. On-site, I was responsible for updating their record keeping system so that moving forward, veterinarians would have easy access to the clinical history of each gorilla. I compiled and input health records for gorilla interventions over the last 20-years into GorillaVMACS, a record keeping system modeled on the one UC Davis' Veterinary Medicine Teaching Hospital uses. Concurrently, I assembled the dataset for my research project – a retrospective case-control study evaluating risk factors associated with snare entrapment, and the impact of subsequent veterinary clinical intervention on gorilla survival.



Luckily for me, the internet in Ruhengeri was far superior to my internet connection in Davis. This allowed for seamless data entry into the online record keeping system. I spent Monday through Friday working on my project, with intermittent breaks for tea and French fries, courtesy of the talented chef, Leon. With help from the phenomenal local staff, I had easy access to all the cases, and the opportunity to create and polish my project's dataset. I quickly learned that respiratory disease and trauma are the leading causes of morbidity and mortality in mountain gorillas, accounting for over half the cases in the last 20 years. The data also showed the clear success of Gorilla Doctors' approach to clinical wildlife medicine. Almost 90% of the gorillas that received interventions in Rwanda recovered completely.



Spending time in Rwanda, I was better able to understand the vast array of tasks the Gorilla Doctors team performs to further their mission. The organization applies a dynamic One Health approach recognizing that the health of the gorillas, their forest ecosystem, and the human communities surrounding them, are inextricably linked. To do this successfully, veterinarians, conservation scientists, park rangers, and local government agencies have to work together towards the same end goal.

Throughout my summer, I reflected deeply on my career aspirations, and my identity and ties to sub-Saharan Africa. After working with Gorilla Doctors, I know that I want to commit my career to free-ranging wildlife and the organizations that support them. Knowing this proves both exciting and utterly terrifying. However, I believe that the most rewarding decisions we make in life are rarely the easiest ones. I am lucky to have had the opportunity to visit and explore a country with so much history, diversity, and beauty. I can't quite articulate how sad I felt to leave Rwanda and the Gorilla Doctors' team after what felt like a very short summer, but I rest easy knowing it's not a forever goodbye. I trust that I will continue to return to the one continent where I truly feel rooted. Not knowing when leaves me aching and longing...until next time.

All photo credits in this article are to the Author (pictured above) Marlene Haggblade

The Wildlife Health Bridge

AW Sainsbury

Zoological Society of London

There is an unequal capacity in training for wildlife health professionals across the globe. While there is a relative wealth of opportunity in developed countries, courses are restricted in developing countries. And yet it is in developing countries, which tend to have higher biodiversity (for example, see the [Global Environment Facility \(GEF\) Index for Biodiversity](#)) where there may be greater need for highly skilled wildlife health professionals to achieve wildlife disease management and wildlife conservation objectives.

As four institutions interested in improving the training of wildlife health professionals, the Zoological Society of London (ZSL), Wildlife Institute of India (WII), University of Edinburgh (UoE) and The Royal Veterinary College (RVC) have formed an initiative described as The Wildlife Health Bridge which aims to increase the capacity of wildlife health professionals in highly biodiverse developing countries. We have run established courses in wildlife health since 1994 (Masters Course in Wild Animal Health (MScWAH) and Masters Course in Wild Animal Biology (MSc WAB)) but the proportion of students from developing countries has been decreasing, probably due to the high cost of living in London for this residential course, and in recent years only 19% of MSc WAH students and 6% of MSc WAB students have originated from developing countries.

The provision of online, flexible, distance courses may help to increase the uptake of students from developing countries because students can take these courses while working (and thus manage the personal cost), can choose to take the course over an extended number of years, and do not need to leave their homes. The University of Edinburgh launched the online MVetSci in Conservation Medicine in 2012 partly for this purpose and numbers of developing country students applying have been encouraging. However, one of the drawbacks of online courses in wildlife health is the very limited ability to provide practical training and experience. This problem can be overcome by providing short, concentrated, residential practical courses for online students to attend. In 2016, the UoE, WII and ZSL joined forces to run a three week practical course in Rajasthan, India, titled Interventions in Wild Animal Health (IWAH), which is an integral elective component of the MVetSci course, and available to selected students from South Asia. The course is also available to a limited number of external veterinary professionals as Continuing Professional Development (CPD).



Participants monitoring and collecting samples during Sambar immobilisation practical. -Photo credit goes to Dan Sprawson ZSL

The IWAH course teaches population monitoring, disease outbreak investigation and surveillance, and field physical and chemical restraint in the beautiful setting of Sariska National Park, with a strong emphasis on teaching field skills. To date 81% of 47 students who attended have been from developing countries, and principally from South Asia.



Remote Injection of a Sambar deer in field conditions. -Photo credit goes to Dan Sprawson ZSL



Participants using a field microscope to analyze samples obtained during pathological investigation of a Sambar deer in the field. -Photo credit goes to Dan Sprawson ZSL

If you are interested in any of the courses here mentioned please see the following websites:

MSc Wild Animal Biology: <https://www.zsl.org/science/postgraduate-study/msc-in-wild-animal-biology>

MSc Wild Animal Health: <https://www.zsl.org/science/postgraduate-study/msc-in-wild-animal-health>

Interventions in Wild Animal Health <http://www.iwah.org>

MVetSci Conservation Medicine
<http://www.ed.ac.uk/vet/studying/postgraduate/taught-programmes/conservation-medicine>

Or contact the Wildlife Health Bridge Coordinator, Alexandra Thomas at alexandra.thomas@ioz.ac.uk

NOTE: Wildlife Health Bridge, and it's graduates, are one of the groups that receive the WDA Newsletter and the weekly WDA News and Announcements free. We welcome them to the WDA family.

Revisiting Brucellosis in the Greater Yellowstone Area

David A. Jessup

Wildlife Health Center, University of California-Davis

Twenty years ago the National Academy of Science (NAS) empaneled a team to examine “Brucellosis in the Greater Yellowstone Area”¹. Brucellosis is arguably the most expensive and contentious disease shared by wildlife and livestock in the USA. Although the 1998 report was a primary source of information on this important subject for the last two decades, it appears that a number of its key findings were wrong. Most importantly, bison are not the source of infections in cattle herds. Free-ranging elk in Montana, not feed-ground elk in Wyoming, are. Contrary to previous beliefs, wild elk are apparently a competent maintenance host for brucellosis, and Strain 19 vaccine is of little or no value in reducing seroprevalence in elk. These, along with other findings, are in “Revisiting Brucellosis in the Greater Yellowstone Area”², the report of the most recent (2015-2017) NAS review panel on what remains a major wildlife-livestock disease problem in North America. (Fig 1.)

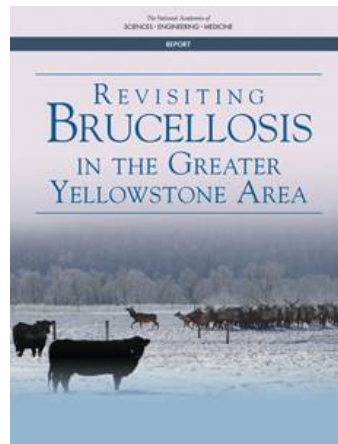


Fig. 1 "Revisiting Brucellosis in the Greater Yellowstone Area", National Academy of Science, 2017

Over approximately 80 years USDA has spent about \$4 billion³ trying to eradicate brucellosis from North America, or at least eliminate it from cattle. There were no cases of brucellosis in cattle from 2000-2005, and USA livestock were declared 'Brucellosis Free'. But, between 2005-2016 brucellosis was diagnosed in 24 cattle or domestic bison herds. Recently (July 2017) a 25th cattle case was identified. All of these were in and around the Greater Yellowstone Area (GYA), most of them in Montana north, northwest and northeast of Yellowstone National Park (YNP).

In 1998 the NAS panel stated "Total eradication of brucellosis as a goal is more a statement of principle than a workable program at present." The 2017 report repeats this admonition, with the observation that things have gotten worse on many fronts in the last 20 years, not better. In other words, reducing risk of transmission is possible, eradication of the disease, or elimination in cattle, goals set as long ago as 1934, given current technology, are not.

For most of the last 30 years it had been argued that bison in YNP were the 'core' of the brucellosis problem, and that elk using winter feed-grounds in Wyoming were the second source, but could be managed if bison brucellosis in YNP was reduced or eliminated. This belief caused a lot of 'finger pointing' between livestock interest groups on the one hand (including rancher organizations, State Livestock Boards and USDA) and conservation groups (conservationists, animal rights groups, hunters and National Park Service) on the other. This polarization, and the recognition that the different agencies involved have different and sometimes incompatible legal mandates, has resulted in fragmentation of what was once (in the 1980's) a more unified approach to dealing with brucellosis. The 2017 "Revisiting..." NAS report makes it clear that cooperation at the highest levels of State and Federal governments will be required for significant progress in reducing brucellosis risk to occur.

One cooperative program that did emerge from the last 20 years was the court ordered Yellowstone Bison Management Plan (BMP). Although not loved by either side, it has largely succeeded in limiting egress of bison from YNP at West Yellowstone and to the North around the Gardiner, MT area (*Fig.2*), and may have contributed to no cases of brucellosis in cattle being traceable to bison. Most conservation groups would like to see bison range more widely, and there are only two cow-calf operations left in the Gardiner valley that are susceptible to brucellosis. But, the social tolerance for greater numbers of bison outside YNP, and legal issues, are yet to be worked out and the BMP has kept bison numbers within GYA controlled and relatively confined. For these reasons the 2017 NAS panel recommended the BMP continue.



Fig. 2 Bison in Yellowstone National park migrate to lower areas near Gardiner, Montana to the North, and toward West Yellowstone in search of winter feed. A court ordered Bison Management Plan currently requires capture, testing, slaughter and/or hunting to keep the growing population in check. *Mark Miller photo credit*

The 2017 NAS report calls for a comprehensive management plan for elk, like the BMP. Since elk are controlled by State wildlife agencies, and the elk move between the three states, the need for cooperation is obvious. The 2017 report mentioned reduction of elk numbers in the GYA, particularly cow elk, as a potential tool to be used along with others. This resulted in an uproar among protectionists and conservation groups. But, what could the panel conclude considering every elk herd in the GYA was reported to be at or over herd goals (presumably based on carrying capacity)?

Further examination of the 2017 NAS report, specifically an experiment done at Muddy Creek feed-ground, reveals the serious limitations of culling infected cow elk that remain in contact with the infected free-ranging population. After five years of test and slaughter of hundreds of elk, the seroprevalence rates returned to baseline within five years after the program ceased. And, the Wisconsin experience of trying to focus hunting and culling of white-tailed deer in CWD infected areas stands as an object lesson in how short a time focused hunting can be used as a disease control tool with hunter valued species, unless serious progress is made toward solving the disease problem.

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Great hope was placed in the ability of Strain 19 brucellosis vaccine in biobullets to reduce infection and seroprevalence rates in elk (*Fig 3*). But after 20 years it is clear that Strain 19 has very limited to no efficacy in feed-ground elk herds. Immune function in elk appears to be very different from cattle, and is poorly understood. Development of new vaccines and delivery systems for elk are needed if this tool is to be used to reduce risk of elk exposing cattle. But, just a few months after the 2017 report was issued, USDA closed the only facility it had for captive elk vaccine and contraception research.

Removal of *Brucella abortus* from 'select agent' status has been proposed, and this might allow significant progress on development of new and/or improved vaccines for elk and bison, but questions remain as to whether vaccination can work in free-ranging animals over vast geographic areas comingling with unvaccinated animals, as well as who has the budget for investigation of these options? A truly effective cattle vaccine would make wildlife brucellosis largely economically and politically irrelevant. But again, with such a small market, who would pay?



Fig. 3 Vaccination of elk on winter feed grounds with Strain 19 has proven ineffective, National Elk Refuge, Jackson Hole. *Google Images*

USDA regulations regarding *Brucella abortus* infections have changed dramatically. State's "Brucellosis Free" status is no longer jeopardized by single outbreaks. Rather, designated surveillance areas (DSA's) are recognized as the unit of control. Cattle and elk in DSAs are monitored, but these DSA's have had to be enlarged as the extent of movement of infected elk has been revealed, and new cases in livestock have been diagnosed. Regulations have been proposed to remove bovine Tb and brucellosis from Federal reportable disease status, leaving primary responsibility for control with the States.

Interestingly, the NAS panel found that elk feedgrounds south of YNP in Wyoming are popular with both wildlife and livestock interest groups and there is limited political support for curtailing or closing them. Management of spatial and temporal contact (like fencing haystacks), and other rancher based preventive methods, appear to be helpful at reducing risk to cattle, and are encouraged. But chronic wasting disease (CWD) continues to move closer to the southern GYA and it would seem reducing the number of feed-grounds, or numbers of elk on them, is inevitable.

There is limited public support for reducing elk populations in the GYA by hunter harvest. Hunting and recreation provide a very significant source of income in the GYA, as much or more than ranching in many counties. Changing land ownership patterns, with many large areas now in private hands with no hunting allowed (private refugia), already limit the ability to reduce elk herds by hunting or culling alone.

Because all of the *Brucella* organisms from the 24 outbreaks between 2005 and 2016 were of elk origin, none of bison origin, the 2017 NAS report makes it clear that elk, not bison, should be the focus of research and management. Most cattle and captive bison infections occurred in Montana north of YNP. Some elk-cattle contacts occurred on private ranches, but as many as half of contacts may have occurred on public rangelands in this area. Elk herds in this area do not enter YNP or utilize feed-grounds, but have high seroprevalence rates (20-30%), comparable to those of elk in close contact on feed-grounds. Infected elk abort between about April 15 and the end of May, and the *abortus* may remain infectious for days or weeks. Thus, temporal and spatial overlap between elk migrating through in Spring, and cattle being turned out on public rangeland to graze, likely constitute a significant risk.



Fig 4. The Greater Yellowstone Area encompasses portions of 3 States and lands belonging to those States, 4 Federal Agencies, tribal lands and private lands. Google images

The GYA is many times the size of YNP (Fig. 4) and includes all of two National Parks, parts of 6 National Forests, BLM lands, State (3) lands, tribal lands, a National Wildlife Refuge, and many thousands of acres of private lands. In this vast and topographically complex area, large numbers of brucellosis infected elk and bison roam, and transmission of brucellosis to livestock continues to occur. One conclusion of the recent NAS report is that brucellosis appears to be spreading spatially, causing the size of DSA's to increase, and the brucellosis situation in general will likely get worse, perhaps resulting in a declared national livestock disease emergency.

There are many other findings and recommendation in the 200 plus page 2017 NAS report. To apply most will require levels of government and private investment, cooperation, compromise, and increased budgets, as well as time and/or good fortune, which makes them

somewhat idealistic or puts off their implementation and effectiveness into the future. But there is one finding that is immediately and fairly easily implementable, likely to be cost effective and reduce risk of cattle exposure and infection, and requires only coordination within one government agency, and the cooperation of ranchers to reduce their own risks of transmission from elk to cattle.



Fig. 5 : Much of the U.S. Forest Service land surrounding YNP is grazed by cattle. This is where risk assessment and changes in grazing practices, particularly in late Spring, could reduce risk of transmission from elk to cattle. Designated Surveillance Areas in Montana, where outbreaks have occurred, include much of the Gallatin National Forest.

Periodic review of grazing allotments on US Forest Service land that surround YNP (*Fig. 5*) is already required. Risk assessment modeling could determine where and when infected elk herds are migrating during the Spring elk abortion season, and which allotments should remain unused, or what modifications in timing and use might optimally reduce potential elk/cattle contact (*Fig. 6*). Reducing, then ending, feeding the elk on Wyoming feedgrounds earlier to encourage migration and reduce spatial and temporal overlap could be coordinated with this. Risk analysis could also determine what other rancher actions might limit disease spread, or improve diagnosis, if and when disease outbreaks occur. Small changes can make big differences – in a risk assessment of domestic sheep contact with bighorn sheep in the Sierra Nevada Mountains it was found that limiting use of the northern portion of the grazing allotment would reduce annual risk of disease transmission and a fatal outbreak of pneumonia in bighorn by 76-82%⁴.

USDA is charged with brucellosis control and research. The US Forest Service (USFS) is an agency under authority of USDA. Although it does assess risk analysis of disease transmission for logging and fisheries actions, it has no program in place to do risk assessment for brucellosis as part of grazing leases. And, as noted, as many as half the 24 outbreaks in the last 10-12 years may have resulted from elk - cattle contact on Federal grazing lands (mostly USFS). Politically complicated State-Federal or interagency cooperation isn't required. New tools requiring a decade of development or massive new data sets are not needed. The mandate for grazing review exists, so new legislation or major increased costs should not be involved. It serves ranchers, and does not negatively affect wildlife. And it may help reduce the likelihood of an eventual national disease emergency (brucellosis spreading to feedlots or outside the GYA)



Fig. 6 Elk with brucellosis abort toward the end of their second trimester, usually during early April through mid-May, often when they are migrating from lower to higher elevations. A key to reducing brucellosis exposure to cattle is spatial and temporal separation. The majority of public lands in the GYA are under USFS jurisdiction and risk assessment could identify lands most heavily used by most highly infected elk herds, and the optimal times and places to avoid exposure. *Google Images*

Reducing risk of brucellosis transmission to cattle is the only feasible and rational overall goal at this time. If done as described above there are few if any biological, political, legal or financial roadblocks to immediate progress toward reduced brucellosis exposure of cattle. Arguably, if USDA were to employ risk assessment and grazing adjustments on USFS lands, continued support of existing State wildlife/livestock efforts, and the efforts of private ranchers, the situation in the GYA may improve vis a vi brucellosis in cattle. Development of effective vaccines and delivery systems could compliment this.

The author was not representing WDA in his role as a member of the 2017 NAS "Revisiting... " panel, and the interpretation, opinions and emphasis in this report are his, not necessarily those of other NAS panel members.

References:

- 1) Brucellosis in the Greater Yellowstone Area, National Academy of Science, 1998, <http://allibrary.co/download/brucellosis-in-the-greater-yellowstone-area.pdf>
 - 2) "Revisiting Brucellosis in the Greater Yellowstone Area, National Academy of Science, 2017, <https://www.nap.edu/catalog/24750/revisiting-brucellosis-in-the-greater-yellowstone-area>
 - 3) USDA – APHIS, Brucellosis Fact Sheet. https://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/bruc-facts.pdf
 - 4) Clifford D. et. al. Assessing Disease Risk at the Wildlife-Livestock Interface: A Study of Sierra Nevada Bighorn Sheep. 2009, Biological Conservation, 142(11);2559-2568. <http://www.sciencedirect.com/science/article/pii/S0006320709002523>
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67th Annual International Conference WILDLIFE DISEASE ASSOCIATION

August 5-10, 2018 | St. Augustine, FL | USA

Connecting Wildlife Health, Conservation and Management in a Changing World

www.conference.ifas.ufl.edu/wda2018

JOIN US!



Call for Abstracts

If you're interested in submitting an abstract for the conference, be sure to check out our website for formatting and submission instructions!

Hotel Reservations

WDA 2018 will be held at the beautiful **World Golf Village Renaissance St. Augustine Resort**. We encourage you to make your reservation early before the WDA room block fills! Call the hotel directly at 904-940-8000 and identify yourself as being with the Wildlife Disease Association Conference, or call 800-468-3571 and use the group code **AWDAWDA** for 1-2 people in a room or **AWDAWDD** for 3-4 people in a room. You can also book online by visiting our conference website. If you plan to room with multiple people, please include all names on the hotel reservation.

Reservations must be made by Monday, July 9, 2018.

Student Workshop

We are excited to announce the student workshop *The Next Pandemic: Interventions from a Wildlife Perspective* will take place on August 2-5, 2018 at the Renaissance World Golf Village before the WDA Conference. This is the first North American WDA Student Workshop. **Don't miss it!**

Conference Sponsorship

In addition to supporting this year's conference, sponsorships will help promote the "One Health" efforts of WDA - our commitment to student and professional education, and wildlife health and conservation. There are various sponsorship levels and benefits, so be sure to check them out today.



Wildlife Veterinary Section Update:

The Wildlife Veterinary Section will be holding an election for section officers early next year. We will also be amending the bylaws to add the Social Media Liaison to the list of officer positions and remove the Newsletter Editor from the list.

Please send nominations to the section chairperson by **January 1st**.

The officer positions are:

- **Chairperson:** Represents the section on the WDA Council, chairs WVS meetings which are held at least every other year, reports on activities of the section to members at least annually, and generally supports and promotes the objectives of the section (see the bylaws on the section webpage)
- **Secretary:** Maintains the section membership roster, records the minutes of section meetings, and prepares, distributes and tallies

ballots of elections.

- **Treasurer:** Maintains the section bank account and keeps track of income and expenses, and provides an annual financial report to the section.
 - **Student Representative:** Represents the WVS on the Student Activities Committee.
 - **Social Media Liaison:** Provides items of interest to the WVS membership to the WDA website editor, Linked In group, and any other social media forum that members would like to use for communication.
-

WDA Africa, Middle East Section:

Wildlife Disease Symposium, at the Tanzanian Wildlife Research Institute

(TAWIRI) Conference, December 6-8, 2017.

Dr. Lawrence Mugisha

WDA-AME Wildlife Symposium



Arusha, Tanzania is at the base of Mount Kilimanjaro

Wildlife Disease Association (WDA)-Africa Middle East (AME) Section has organized a **WDA-AME Wildlife Disease Symposium** as part of the **11th Tanzania Wildlife Research Institute (TAWIRI) Scientific Conference** that will be held at the Arusha International Conference Centre (AICC) in Arusha, Tanzania from 6-8 December 2017.

TAWIRI conference will be held under the theme: **“People, Livestock and Climate change: Challenges for sustainable biodiversity conservation”**. The special WDA-AME Wildlife Symposium will be under the sub-theme: **“Wildlife Diseases and Ecosystem Health”**.

WDA-AME Wildlife Disease Symposium is entitled: **“The role of Wildlife Health Professionals and the increasing trend of emerging and re-emerging diseases at wildlife-livestock-human interface”**.

The objectives of the symposium include:

1. To mobilize wildlife health professionals to proactively engage in investigation and outbreak responses of infectious diseases of wildlife origin
2. To equip wildlife health professionals with current knowledge and status of infectious diseases

3. To update wildlife health professionals with advances in one health approaches to disease investigation and outbreak responses

Hence, we call for abstracts following the guidelines published for TAWIRI conference by following the link below for details:

http://www.tawiri.or.tz/index.php?option=com_content&view=article&id=26&Itemid=25

Abstracts for the WDA-AME Wildlife Disease Symposium should be submitted to mugishalaw@gmail.com for special handling and submission by the section. The abstract should be submitted together with the filled registration form.

¡Viva Mexico!

Summary of 66th Annual International Conference

David A. Jessup,

WDA Executive Manager

Sarah Sirica,

WDA Newsletter Editor



Attendees of the 66th Annual International Conference. *Photographer unknown*

San Cristobal de las Casas was a great location for the 2017 WDA Annual International Conference. Situated in the mountains of southern Mexico, about 2 hours drive from the Guatemala border, the climate was perfect and the biological diversity within close proximity, spectacular. Day trips to waterfalls, volcanoes and the ruins of Tikal were all easy to make.

A regional culture and music festival was going on in San Cristobal during the conference and there were parties, dances and street festivals, as well as street vendors from all over the region in town. It was all very picturesque, very real, not a tourist destination resort sort of experience. Each of the many churches were celebrating their patron saints with fireworks, so the background noise, even during some of the presentations, was explosive (you had to be there!).



The first day's opening talks were some of the best ever for a WDA conference. Carol Meteyer led off by discussing when and how intervention in wildlife disease events works, and she was followed by Frances Gulland who presented the very topical, widely cooperative efforts to save the remaining few vaquita in the upper Gulf of Mexico. Richard Kock told us about the massive saiga dieoff in Mongolia in 2016 due to small ruminant morbillivirus that followed a massive dieoff due to Pasteurella in 2015, and then Tierra Evans spoke about mountain gorilla health challenges – the subject of the lead article in this WDA Newsletter.

The efforts of many students were celebrated at the 2017 Conference; the list

of winners is as follows:

- Research Recognition Travel Award: Viviana Gonzalez-Astudillo
- Terry Amundson Presentation Award: Marlene Haggblade
- Terry Amundson Presentation Honorable Mention Award: Bienenke Bron
- WDA Scholarship Award: Carolyn Hodo, Charlayna Cammarata
- Student Poster Award: Jamie Rothenburger

(*Follow [link](#) for pictures*)



- 2017 Distinguished Service Award:
Laurie Baeten



- 2017 Duck Award:
Debra Miller



- AAWV Scholarship Award:
Sonia Jenny



- Wildlife Veterinary Section Travel
Award for Oral Presentation:
Lilian Catenacci



• Wildlife Veterinary Section Travel Award Poster Presentation: Sofia Bernal



• 2017 Tom Thorne and Beth Williams Memorial Award: Carol Meteyer and David Blehert

- Carlton M. Herman Founder's Fund: **Rodolfo Dirzo** (*not pictured*)
- 2017 WDA Emeritus Award winner: **Charles van Riper III** (*not pictured*)

Many people helped make this conference a success, particularly "Team Mexico" (Gerrardo Suzan, Oscar Rico, Chucho Sotomayor and Ana Viguera). Ezequiel Hidalgo and his committee did an excellent job reviewing and sorting out the best presentations, and Tiggy Grillo headed the Student Awards Committee that did the same for students and also judged the competition. One side benefit of the 2017 WDA conference was a doubling of our Latin American membership and the development of a very enthusiastic group of students. See a story about that below in this WDA Newsletter.

WDA tries to hold its annual international conferences around the world, roughly in proportion to where its membership lives. This means that about once every 10 years we meet in Latin America, a bit more often than that in Australia and Europe. These conferences in exotic places provide unique opportunities to experience the culture, foods, customs, traditions as well as scientific interests of our colleagues. They may not be as convenient as meeting at a conference center or an airport hotel, but they are much more 'real' and offer opportunities for learning and understanding, and a richness that must be experienced.

Viva Mexico ! Viva Zapata ! Viva la Revolucion !



Hasta la Vista from Mexico !! Richard Kock and Dave Jessup kick back after the banquet in 'La Revolucion' in San Cristobal de las Casas, Chiapas, Mexico (*photo credit Tom DeLiberto*)

Will a WDA-Latin America Student Chapter Emerge From The Conference ?

Irene Sacristán Yagüe

Conservation Medicine PhD Program,
Faculty of Ecology and Natural Resources,
Andrés Bello University, Santiago de Chile, Chile.

*See contributing student list at end**

Latin American student members of WDA met during the 66th Wildlife Disease Association International Conference held this year at San Cristobal de las Casas in Chiapas, Mexico. The idea to have a section-wide student chapter was inspired by the example of the Australasian Student Chapter, the European Student Chapter, and several Universities' Student Chapters. The idea was widely accepted between more than 40 students attending the conference, and soon tasks were identified.

Editor's Note: Under WDA ByLaws, student chapter proposals must be submitted to the Chair of the Student Activities Committee (SAC). If the application is in order, it is passed to the WDA President, and if he/she approves, it goes to Council for final approval. The support and approval of the parent Latin American Section (LAWDA) will be also be sought. The process generally takes about 3-6 months.

With strong common ideas we began to work on the creation of a chapter. We created a working group composed of members from several countries, to conform the concept of representing all interested students in Latin America (see the list of participants at the end of this article). A date was established for a Skype meeting between the chosen working group members. This meeting took place the 22nd of September, with very good results. Another important objective was to build support, not only for the proposed WDA-LA Students Chapter, but also the WDA in general, spreading information about the privileges of becoming a member of this important worldwide association.

During these last few months, diffusion work has been carried out in different countries:

In São Paulo, Brazil on September 14th, delegates Angélica María, Sánchez Sarmiento, and Carlos Sacristán Yagüe met with 25 members of the Brazilian Student Group of Wild Animals from the University of São Paulo (GEAS). This group is under the umbrella of GEAS Brazil, the most active veterinary student association in the country, comprised of more than 300 members. Usually one GEAS is present in each veterinary school across the country. The goal of the meeting was to promote the novel initiative of the creation of the WDA-LA Student Chapter. One of the proposals was the future integration of GEAS-Brazil into the WDA-LA Student chapter. GEAS São Paulo supports the initiative and will help to promote the mission of WDA to the other regional GEAS associations.

In Santiago, Chile, on August 25th and 26th, delegates Josefina Gutiérrez, Aitor Cevidanes, Luis Flores, Hugo Mendoza and Irene Sacristán put up a WDA display at the Fifth AMEVEFAS Symposium, the meeting of the main national association of wildlife veterinarians in Chile. This association is comprised of more than 200 members. The symposium had more than 150 attendees and many of them were interested in the WDA stand, taking 70 brochures with WDA information. For future actions we're planning to give talks in different Universities in Central and Southern Chile.

In August in Lima, Perú, delegate Micaela De la Puente Leon gave a talk to 12 biology undergraduate students and 2 professors of the National University Federico Villarreal. These students work in the laboratory facilities of the university and their work relates to several areas of research in wildlife. The purpose of this talk was to promote the WDA focus among students of other disciplines besides veterinary medicine.

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In late September, an open talk to students and professionals was given at the Veterinary School of Peruvian University Cayetano Heredia. This talk was hosted by the Conservation Medicine Student Group (GMC) and the ONG CONSERVACCION with the aim to promote the WDA and the initiative to create the WDA-LA Student Chapter. For this purpose, the GMC would be the local actor at the university, while ONG CONSERVACCION would continue engaging other student groups of Peruvian universities.

We encourage any student interested in forming and participating in the future WDA-LA Student Chapter to contact us, by sending an email to wdalastudents@gmail.com



Attendees from the first meeting to create the WDA-LA Student Chapter at the 66th WDA Conference in Chiapas, Mexico. *Photo credit Catherina Vendl*

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Student Corner What's on?

It has been a great summer for the WDA students: The international conference in Mexico turned out to be a great success and the AAZV/WDA mentoring program has finally taken off. We'll also take a short side-trip to learn about lesser known inhabitants of the Great Plains of the US.

AAZV/ WDA mentoring program

110 mentee and 73 mentor applicants from 28 countries, including 54 applicants from South America! Thanks a lot to all applicants, especially the Spanish speaking mentors for your commitment! You want to become part of the program? Keep your eyes open for the next application round and see:

<http://www.wildlifedisease.org/wda/STUDENTS/MentoringProgram.aspx>

Young wildlife professionals in focus

Where does the journey lead you? In this rubric we introduce extraordinary young vets and biologists who followed the sometimes rocky road of wildlife science all the way through:

The perks of 5 years among fleas

In 2010 Bienenke Bron found her calling: While doing an internship at the plague research lab of the USGS National Wildlife Health Center in Madison, Wisconsin, she got to see One Health in action. One Health emphasizes that human, animal and environmental health are closely connected. The concept was fairly new back then and Bienenke was fascinated by it.



Bienenke with a prairie dog, a common victim of the plague

Of rats and men

Just over a century ago rats and their fleas piggy-backed on ships and introduced *Yersinia pestis* to North America. Subsequently, the plague didn't only kill countless Americans but also infested the native small rodent population. The small rodents in turn passed on the highly contagious germ to larger and more susceptible mammal species like squirrels and prairie dogs. Ever since, *Yersinia pestis* has lived on in various reservoir populations in the Western USA and still causes episodic plague outbreaks devastating complete prairie dog colonies, subsequently affecting many species that depend on them, including the endangered black-footed ferret and even occasionally infecting humans. In 2015, a bad plague year, the Centers for Disease Control and Prevention reported 16 cases of human plague, four of those resulting in death. To manage plague in prairie dog colonies a large collaboration of researchers developed an oral vaccine.



Heading for new shores

After finishing her vet degree in the Netherlands in 2012, Bienenke returned to the plague research lab at the University of Wisconsin in Madison to start her PhD. Her mission was to investigate the disease ecology of plague and the impact of the oral vaccine on small rodents like mice and voles living among the prairie dogs.

What remains

This August, Bienenke finished her thesis. She concluded that the vaccine didn't impact small rodents other than prairie dogs during her study. But Bienenke learned so much more. A molecular tool that refused to work threw her into a period of self-doubt, which most PhD students can tell you a thing or two about. She realized that she had a problem and sought advice from a career counsellor, who aided her in balancing her strengths and gave her a fresh focus. The self-reflection confirmed that Bienenke genuinely enjoyed mentoring students, organizing fieldtrips and working in a team.



Bieneke's fieldteam on a mission; credit: Colleen Crill

Her hard work paid off, and paved her way into academia: Bieneke will shortly start a postdoctoral position at the Upper Midwestern Center for Excellence in Vector-borne Diseases. While she is looking forward to more work with little stinging, crawling and biting disease transmitters, she wishes someone had told her one thing before she began her PhD: Take a course on data organization or you will get lost!

Learn more about Bieneke and her research: <http://gmbroon.wixsite.com/bieneke>

The WDA Conference in Mexico 2017

A students' perspective

We had a great time at the 66th WDA International Conference in San Cristobal de las Casas, Mexico! The meeting offered great opportunities to learn about current research, socialize, and network with wildlife disease professionals. We arrived Sunday night, after a lengthy day traveling and a slightly harrowing taxi trip through Chiapan mountains.



Students at the Mentor Mixer

On Monday, we grabbed breakfast at a local cafe, and got only slightly lost walking to the conference venue. We settled in for a day of inspiring talks, from Carol Meteyer's and Frances Gulland's talks about emerging wildlife diseases and saving the vaquita, to presentations on hantavirus and Lyme disease. The talks were interspersed with a delicious catered lunch plus several coffee breaks with tasty pastries. That evening, we kicked off our

socializing at the student-mentor mixer, where we made great new connections, and heard inspiring stories from established scientists about finding their professional niches.

On Tuesday we scoped out another cafe then rushed back for a day of fascinating student talks about research from gorillas to plague. Presentation anxiety aside, we were grateful to share—and engage in fruitful conversations with other attendees about—our research. After a fun poster session social, we headed to the always-entertaining auction, where a student made history as the highest WDA bidder!

On Wednesday we woke up early for the American Association of Wildlife Veterinarians meeting—a great example of how WDA helps students meet professionals, get involved in similar groups, and see behind-the-scenes how professional organizations operate. We then joined colleagues for an unparalleled day visiting mountain waterfalls and Mayan sites.

On Thursday, after another day of great presentations, we celebrated the end of WDA with the final banquet, complete with a DJ and lively salsa dancing.

The weather was perfect, the food was amazing, and the town was charming. Our other highlights included sipping chocolate, street corn, al pastor tacos, and Mayan crafts markets. As usual, we returned with new student friends, updated knowledge, and some great connections for the future!



Jenny Bloodgood, Shannon Curry, and Sonia Hernandez at the conference excursion

The authors, Jenny Bloodgood and Shannon Curry, are officers of the University of Georgia WDA Student Chapter. If you have any suggestions for a young wildlife professional in focus or if you have any other ideas for the Student Corner, please send an email to Catharina Vendl, Student Representative on Council, (catharinvendl@gmail.com).

Quarterly Wildlife Mortality Report

October 2017

Written and compiled by members of the U.S. Geological Survey National Wildlife Health Center - Wildlife Epidemiology & Emerging Diseases Branch.

Duckling Mortality in Washington D.C.

The National Park Service's (NPS) National Mall and Memorial Parks (NAMA) experienced a mallard (*Anas platyrhynchos*) duckling die off at the Lincoln Memorial

Reflecting Pool in Washington, D.C. beginning on May 21, 2017. Over the span of 21 days, a total of 91 mallard ducklings died. No adult mallards or other species present in the area experienced mortality. Twenty-nine duckling carcasses were collected by NPS biologists and sent to the U.S. Geological Survey's National Wildlife Health Center (NWHC) for diagnostic evaluation. Significant disease processes identified in these ducklings included severe schistosomiasis and intestinal coccidiosis, both of which can be lethal. Parasites, including schistosomes and coccidia, are common in wild waterfowl and not invariably fatal. However, if a site is heavily contaminated, a high parasite burden can result in mortality, particularly in young, vulnerable birds. Anecdotally, a large number of unidentified snails were observed in the Lincoln Memorial Reflecting Pool during the duckling mortality. The reason for this unusual mortality may be related to atypically warm temperatures and/or a build-up of organic debris and snails, the intermediate host for avian schistosomes.

NAMA resource management staff coordinated closely with NWHC staff, the NPS Biological Resource Division wildlife veterinarians, and the NPS Office of Public Health to identify the best management options. In order to reduce the likelihood of additional mallard duckling deaths and zoonotic concerns, it was agreed that the best management practice would be to drain and clean the Lincoln Memorial Reflecting Pool, which was completed in mid-June. This had been done in 2008 and 2012 to manage avian botulism outbreaks. No reports of human 'swimmer's itch' (cercarial dermatitis caused by schistosomes) associated with this event were reported. Following the draining, cleaning, and refilling of the pool, no additional mortalities were reported.

Leslie Frattaroli, NPS NAMA, contributed to this report.

Continued decimation of coral populations throughout the Florida Reef Tract

A coral mortality event in Florida continues across a large portion of the Florida Reef Tract, being detected as far north as Martin County, Florida and south into the upper Florida Keys in Monroe County. The mortality was first reported in 2014 near Miami-Dade County and was likely exacerbated by an unusually warm water event that caused severe coral bleaching during the summers of 2014 and 2015. Disease observations have continued into 2017. Although mortality events have previously occurred in the coral communities of the Florida Reef Tract, this event is unusual due to its expansive spatial extent, the number of affected species (at least 21 scleractinian coral species), and severity of losses (> 95% of known *Dendrogyra cylindrus* colonies in southeast Florida).

The cause is unknown but suspected to be multifactorial and potentially involves the interactions between temperature and nutrient stresses, sedimentation, and perhaps opportunistic pathogens. A multi-agency collaboration involving the U.S. Geological Survey's (USGS) National Wildlife Health Center (NWHC), Florida Department of Environmental Protection (DEP), University of Hawaii, USGS St. Petersburg Science Center, Florida Fish and Wildlife Conservation Commission (FWC), George Mason University, and multiple other partners has been established to determine the causes and contributing factors to this widespread mortality event in order to develop actions to slow its spread and reduce its impact on the remaining coral communities.



A colony of *Pseudodiploria strigosa* displaying active disease and recent mortality along the Florida Reef Tract. Photo credit: Florida Department of Environmental Protection

White-nose syndrome fungus could spread during summer

Pseudogymnoascus destructans (Pd), the fungus that causes [white-nose syndrome](#) (WNS) in bats, could be spread in summer months by bats and humans visiting contaminated caves and mines and subsequently visiting uncontaminated sites. In a

study recently published in the [Journal of Wildlife Diseases](#), researchers from the U.S. Geological Survey's National Wildlife Health Center (NWHC) tested samples collected from bats, the environment, and equipment at eight bat hibernation sites in Kentucky, Indiana, Ohio, Tennessee, and Virginia. They found that bats occupying such sites in summer can harbor the Pd fungus on their skin, and that Pd is more readily detectable in their guano. The scientists also detected Pd on clothing and equipment taken inside and near caves and mines used by bats. This detection demonstrates that gear exposed to fungal-infected environments is a potential mechanism for Pd spread, even during summertime when the prevalence of WNS is low.

In the study, NWHC scientist Dr. Anne Ballmann and her colleagues collected swabs from bat wings, cave walls, and equipment used in and near the study sites, and collected guano from individual bats and floor sediment in underground summer roost sites. Findings included:

- Pd was detected on 40 bats and on environmental samples from seven of the eight study sites
- Guano accounted for 93 percent of the bat-associated Pd detections
- Equipment, including trapping equipment and a backpack, from three WNS-impacted sites in Kentucky, Indiana, and Ohio tested positive for Pd DNA
- Pd DNA was more readily detected in sediment samples than on swab samples from cave walls

No bats showed visible signs of WNS during the course of the study, even though the disease-causing fungus was found. Although exposure to Pd does not result in WNS during summertime, the study showed that the fungus that causes the disease could be transported by bats and people visiting contaminated sites in summer and subsequently visiting uncontaminated sites.

First detected in New York State in the winter of 2006-2007, [WNS has spread to 31 states and five Canadian provinces](#). The disease is named for the white fungus that infects the muzzle, ears and wings of hibernating bats. Scientists at the USGS National Wildlife Health Center discovered, characterized and named the fungus that causes WNS, and pioneered laboratory techniques for studying effects of the fungus on hibernating bats.

[Decontamination guidance](#) for cave visitors to help reduce the risk of human-assisted movement of Pd is available. The USGS is part of an [international coordinated response to WNS](#), which is led by the U.S. Fish and Wildlife Service.

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://www.nwhc.usgs.gov/whispers/>

To request diagnostic services or report wildlife mortality:
<http://www.nwhc.usgs.gov/services/>

