



AMERICAN ASSOCIATION OF WILDLIFE VETERINARIANS

FALL 2007

PRESIDENT'S MESSAGE

by Jonathan Sleeman

What a fantastic conference! It was great to see so many AAWV members at the joint American Association of Zoo Veterinarians/American Association of Wildlife Veterinarians Conference in Knoxville, Tennessee. Huge thanks go to Ed Ramsay and his team from the University of Tennessee College of Veterinary Medicine and the Knoxville Zoo for their tremendous efforts in hosting the event. In addition, a special thanks goes to the AAZV, in particular Ed Ramsay, Mary Denver, Tom Meehan and Rob Hilsenroth, for their invitation to meet jointly and for being such a pleasure to work with. There is no doubt this joint meeting has helped to strengthen the strategic alliance between the two organizations, and we look forward to working very closely with the AAZV on issues of mutual concern in the near future.

The AAWV was very active during this meeting, chairing sessions, participating in the auction event (see article on page 2) and sponsoring a Chronic Wasting Disease Workshop (see article on page 2), among other activities. I would like to particularly thank Bill Lance, Terra Kelly, Jim Sikarskie, Christine Fiorello, Bryan Richards and Walt Cottrell for representing the AAWV and for all their hard work. The highlight of the meeting was our Cutting Edge Speaker, Dr. Michael Hutchins, Executive Director of The Wildlife Society. He gave a very thought-provoking presentation on the needs and mechanisms for increased collaboration between wildlife biologists and veterinarians. With the ever-increasing threat to natural resources and human and domestic animal health from emerging wildlife diseases, his presentation was timely, necessary and a message we should all embrace. It is hoped this will be the beginning of a fruitful relationship between the AAWV and The Wildlife Society.

The conference also signaled the inauguration of our new AAWV officers: Mark Cunningham (vice-president), Colin Gillin (secretary), Mark Drew (treasurer), and me (president). I encourage you to contact any of us at anytime if you have ideas, questions, comments or concerns. In addition, I recommend familiarizing yourself with the Advisory Council. As immediate past-president, Kirsten Gilardi will chair the Council; the other members will likely be decided by the time you read this. One slight change from previous years is that some council members have been given specific charges: Scott Larsen will be the AAZV representative; Sonia Hernandez-Divers will be our international liaison as well as in charge of student affairs; and Steve Osofsky will be our policy wonk. Again, please contact any of the council members if you have any ideas for discussion.

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New Marine Mammal Necropsy Manual

The Woods Hole Oceanographic Institution announces the release of *Marine Mammal Necropsy: An introductory guide for stranding responders and field biologists*. The manual is divided into six sections: preliminary data, sample management, pinned, small cetacean, large whale (at-sea and on the beach), and multiple appendices (A-H). A sample blank gross necropsy report and guidelines in writing a report are included. The manual is designed to establish a base level of proficiency in marine mammal necropsy techniques, and focuses on process and interpretation. Although it is written for individuals who do not have a formal pathobiological training and have limited knowledge of anatomy, it may also be useful for veterinarians newly expanding into the field of marine mammal pathobiology. A free PDF download is available at <https://darchive.mblwhoilibrary.org/handle/1912/1823>, or a hard copy can be ordered for purchase by emailing Katie Pugliares at kpugliares@ifaw.org.

TIME TO RENEW MEMBERSHIP FOR 2008!

Member dues are the primary source of revenue for AAWV and enable us to produce newsletters, provide important representation for wildlife veterinarians at national meetings, and pay for cutting edge speakers at conferences we jointly organize. Your dues allow your officers, advisory council, and member volunteers to serve you as a wildlife veterinarian.

Please use the self-contained membership form/envelope included in this newsletter, or you can get the membership application page on the AAWV website at www.aawv.net/memberapplication.htm, print and fill out the renewal form, and send it along with a check to Colin Gillin, AAWV Secretary at the address given.

Annual dues are \$40 for active veterinarians and subscribers and \$20 for students. If you are paying for more than one year please note the years on your check. And if you are including a contribution to the Thorne-Williams Memorial Fund please specify the amount to be deposited to that fund on your check or give your donation in a separate check. As always, thanks for being part of a great organization!

AAWV NEWSLETTER
IS PUBLISHED BY THE
**AMERICAN ASSOCIATION OF
WILDLIFE VETERINARIANS**

Founded in 1979, the AAWV is a national, non-profit organization of veterinarians interested in all aspects of wildlife health.

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Continued from page 1, President's Message

Finally, with the approval of our Five-Year Strategic Plan, the hard work now begins! The plan provides us with a road map and is very ambitious, but appropriately so. However, the officers and council members will not be able to implement the plan alone. It will require the help of the membership to make it succeed, and thus we are forming various task forces to implement parts of the plan such as development (fund raising), policy and communications. If you have an interest or expertise in any of these areas (or have great ideas concerning how to implement the plan), PLEASE VOLUNTEER!

I am very proud and humbled to be president of this organization, and I am looking forward to the opportunity to serve you. I am confident that together we will have a very productive couple of years.

The AAWV is interested in sponsoring more workshops and wet labs at future conferences; if you have any ideas for topics please send them to Mark Cunningham, AAWV vice-president, at Mark.Cunningham@MyFWC.com.

Annual Auction Raises Over \$1200 for AAWV

Christine Fiorello

The AAWV auction in Knoxville was a great success! Thank you to everyone who donated items and to everyone who bid on items in both the silent and the live auctions. We brought in a total of \$1229, with a net of \$1180 after a 4% fee paid to the AAZV to cover credit card processing fees. We also owe a big thank you to the Knoxville Zoo, which donated the elephant painting to the live auction. We depend heavily on members bringing in donations, so keep our organization in mind during your travels in the coming year and let's aim to make \$2000 at our next auction!

Have a wildlife health-related paper you want published?

Dave Jessup

The Journal of Zoo and Wildlife Medicine (JZWM) is a happening journal for potential wildlife publications under its new Editor, Dr. Teresa Morishita. JZWM recently got caught up on all back issues and has reduced its turn around time to as little as 8 months (when submitters and reviewers cooperate). Submission and page costs are comparatively very low. JZWM welcomes articles on free-ranging wildlife, in particular diseases and health programs, vaccination and treatment protocols, physiology and welfare, immobilization and anesthesia, as well as other subjects. Dave Jessup has agreed to act as an Associate Editor to JZWM for free-ranging wildlife articles and will work with you to get your work thoughtfully peer reviewed and into publication as quickly as possible. Please see JZWM or go to www.aazv.org for instructions to authors.

Chronic Wasting Disease Workshop Big Success

During the recent joint meeting between the AAZV and the AAWV in Knoxville, TN, the AAWV sponsored a full-day workshop on chronic wasting disease (CWD). We had several participants, including veterinary students from across North America, and an international attendee. Bryan Richards, CWD Coordinator from the USGS National Wildlife Health Center, gave lectures on topics including a thorough review of the history of the disease, current thoughts on pathogenesis, as well as implications for management of free-ranging cervids. In addition, he provided an overview of the current status of CWD in North America. The participants were also given several "CWD outbreak" scenarios in which they had to plan and discuss how they would respond to the detection of CWD in a variety of circumstances.

The afternoon was devoted to CWD diagnostic techniques. After a brief lecture on sample collection and diagnostic tests, the workshop moved to the laboratory and Dr. Walt Cottrell, wildlife veterinarian for the Pennsylvania Game Commission, demonstrated how to collect the appropriate diagnostic tissue samples from deer. The participants were then given the opportunity to practice sample collection from deer heads collected as part of the ongoing CWD surveillance program for a local national park.

We thank the University of Tennessee College of Veterinary Medicine, especially Ed Ramsay and veterinary students, for hosting this workshop. We also thank the AAZV, especially Tom Meehan and Rob Hilsenroth, for help in organizing this event. We are especially grateful to Bryan Richards and Walt Cottrell for donating their time to teach this workshop. (Want more workshops? See note at left).



AAWV SUPPORTS PROPOSAL FOR INCREASED RESTRICTIONS ON WILDLIFE IMPORTATION

In 2003, the FDA instituted an Interim Final Rule concerning capture, trade, movement and release of domestic and exotic rodent species in response to an outbreak of Monkeypox traced to a shipment of African rodents imported for the pet trade (see the Spring 2007 newsletter for a letter from the AAWV in support of the Rule). In July of 2007, due in part to concerns about the limited scope of the 2003 Rule and in an attempt to further decrease the risk of importing exotic and zoonotic diseases into the United States, the Centers for Disease Control (CDC) published an Advanced Notice of Proposed Rulemaking (ANPRM)

concerning further proposed regulations on the importation of domestic and wild animals into the United States.

Representing the AAWV, the following letter of support has been submitted to the CDC by Jonathan Sleeman, AAWV President. The letter was purposefully written in general terms, to address large-scale issues presented by the importation of domestic and wild animals into the United States; in addition to this general letter of support, AAWV members are encouraged to read and individually comment on the specifics of the ANPRM (full text: www.cdc.gov/ncidod/dq/pdf/anprm.pdf).

To: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Division of Global Migration and Quarantine; ATTN: Animal Import Regulations
From: American Association of Wildlife Veterinarians
Re. COMMENT: 42 CFR Part 71, Foreign Quarantine Regulations, Proposed Revision of HHS/CDC Animal-Importation Regulations [RIN 0910-ZA21]

The American Association of Wildlife Veterinarians (AAWV) is a non-profit (501(c)-06) organization comprised of approximately 200 members based primarily in the United States and Canada. Our members work as free-ranging wildlife veterinary practitioners, pathologists, researchers, and policy makers for natural resource agencies, academic institutions, non-profit organizations, industry, and tribal nations. The AAWV is recognized by the American Veterinary Medical Association, holds a seat on the United States Animal Health Association's Board of Directors, and comprises the Wildlife Veterinary Section of the Wildlife Disease Association.

On behalf of our members, we wish to go on record in strong support of increased restrictions on the importation of wild animals for the pet trade. In addition to the concerns expressed in your document that trade in wildlife increases the risk for transmission of infectious diseases (including foreign animal diseases and emerging pathogens) to animals and humans, we urge the CDC to consider the detrimental ecological and economic impacts of introduced non-native species on native fauna and flora. It should be recognized that certain species, if introduced into wildlife habitat, could become invasive and negatively impact native fish and wildlife populations both directly and indirectly as a result of environmental degradation. Many examples of this problem already exist and include species as diverse as introduced European starlings and zebra mussels competing with native North American species as well as wetland destruction caused by introduced nutria (*Myocastor coypus*). The financial cost of trying to control these invasive species is huge. The Invasive Species Information Center (<http://www.invasivespeciesinfo.gov/>) is an excellent source of information on this subject. Consequently, the AAWV holds the position that species having the potential to become invasive or serving as vectors or reservoirs of disease should not be imported into the United States and should not be kept as pets. Furthermore, some species of wild animals collected for the pet trade are taken from the wild illegally or harvested in unsustainable or inhumane ways increasing the risk for species extinction. We are proponents of the need to educate pet owners of these risks and encourage owners to avoid keeping species commonly subjected to illegal importation and sale.

The AAWV urges the CDC to work with the U.S. Fish and Wildlife Service, the U.S. Department of Agriculture, the U.S. Department of Homeland Security, the Environmental Protection Agency, state natural resource agencies, and non-governmental organizations to develop and maintain a list of undesirable species for which importation is prohibited or restricted. In addition, working with wildlife management agencies will assist the CDC in accurately identifying the many species of concern at ports of entry. Most state wildlife agencies already maintain lists of undesirable species, and these lists could be used as a model for a similar CDC list (see Virginia Department of Game and Inland Fisheries regulation 4VAC 15-30-40 on importation requirements, possession and sale of nonnative (exotic) species as an example: <http://leg1.state.va.us/cgi-bin/legp504.exe?000+reg+4VAC15-30-40>). We urge the CDC to recognize that the issues of zoonotic diseases, agribiosecurity, ecosystem health, and wildlife conservation are closely linked, and that collaboration between public health, agriculture and wildlife management agencies is needed to successfully address these urgent problems of mutual concern.

We thank you for the opportunity to comment on these proposed rules, and please do not hesitate to contact me if you have any questions or require additional information.

Respectfully submitted,

Jonathan Sleeman, MA, VetMB, Dipl. ACZM, MRCVS
President, American Association of Wildlife Veterinarians

PUBLICATIONS OF INTEREST

[Editor's note: articles and abstracts appearing in this section of the newsletter are synopses of journal publications considered to be of special interest to AAWV members. All synopses have been approved by the authors and/or publishers for use in the AAWV newsletter. For full text, please refer to the cited source material.]

Vulnerability of a killer whale social network to disease outbreaks.

Guimaraes, P.R. et al. *Physical Review E* 76, 042901 (2007)

Introduction

Emerging infectious diseases are among the main threats to endangered populations and ecosystems. Disease outbreaks are likely to promote ecological replacement between species, cause local extinction of animal and plant populations, and contribute to the global extinction of some species. In this context, a particular problem for conservation strategies is that an epidemic only becomes apparent after it has reached extreme levels. Therefore, predicting the vulnerability of populations to epizootics can help to prevent the local extinction of endangered populations.

In social mammals, disease dynamics is affected by patterns of contact among individuals. The structure of this network of contacts can influence the emergence of epidemics and therefore the viability of these populations. In spite of the importance of network structure for disease dynamics in human societies, no previous study investigates the implications of this structure to disease outbreaks in animal populations. Here, we used a network approach to characterize the complex social organization of endangered mammal-eating killer whales (*Orcinus orca*) and infer their vulnerability to disease epidemics, and to understand the structural basis of any recorded vulnerability.

Data Collection

Our study is based on systematic observations of social interactions among mammal-eating killer whales around the southern tip of Vancouver Island, British Columbia, Canada and in adjacent areas of Washington State, U.S.A., from 1984–1996. Most (approximately 90%) of the encounters took place with good sighting conditions, and encounters were distributed both near shore and offshore throughout the study area, thus we believe that there should be no strong bias for sighting larger groups. Our sample contains the social interactions of 43 individually identified killer whales, representing approximately 25% of a total population of about 170 individuals.

Killer Whale Social Network

Mammal-eating killer whales are one of the reproductively isolated forms of killer whales that live along the Pacific coast of North America. In the killer whale social network, individuals are represented by nodes and two individuals are connected by a link if they were recorded at least once in the same group, a group being defined as all whales acting in a coordinated manner, e.g. all traveling in the same direction at the same speed. To characterize network topology, we described basic structural aspects of killer whale social network, including degree (number of links per node), average path length (the average number of

links between two individuals), and the node's clustering coefficient C_i , a function based on numbers of links for individual i and its neighbors and varying from 0 (if the individual is not part of a cohesive group) to 1 (if the individual is part of a highly cohesive group).

In this form of killer whale, groups are usually small, containing an average of four individuals. Some individuals are often observed together, such as adult females and their first-born males. However, males and females without offspring temporarily associate with different groups, and groups often aggregate to hunt large marine mammals and perform social activities, leading to a complex social organization. To describe this variation in the strength of social interactions, we use the amount of time two individuals are observed together in a group. We quantify the temporal stability of the social interaction using the half-weight association index w_{ij} , which scales from 0 (two individuals never recorded together) to 1 (two individuals always recorded together).

Disease Simulations

We model the dynamics of disease spreading in the killer whale network using the susceptible-infected (SI) model, and include a factor f representing the fraction of individuals that is naturally nonsusceptible to the disease. Therefore, our simulations explore scenarios in which a disease may affect only a small part of the population (f approaching 1) and others in which the entire population is vulnerable (f approaching 0)

We start the spreading process from a single seed. For a given fraction f of nonsusceptible individuals, we perform extensive simulations as follows: at each time step, (1) disease spreads from an infected individual i to all healthy and susceptible animals j that directly interact with it with a probability equal to the half-weight index of association w_{ij} ; (2) the individual i becomes noninfective, simulating death or the end of the infective period. The simulation stops at time t_{max} when all healthy and susceptible animals are infected or the disease spread is over. We count the number of individuals infected up to time t_{max} . To understand the structural basis of the observed vulnerability, we perform similar sets of simulations in networks in which we (1) controlled for the effects of the observed distribution of links among individuals; (2) controlled for the effects of the interaction weight and; (3) controlled for both observed distribution of links and interaction weight, as in classical epidemiological models.

Results

We recorded 253 links, representing 28% of the 903 possible links between the 43 study individuals, and leading to an average of 12 links per individual. The minimum number of links recorded for an individual was 4, and the maximum 23. The probability that a random network with the same number of individuals and links as that of the killer whale network has at least one individual with 23 links is very small ($p < 0.01$), suggesting that random links among individuals did not reproduce the existence of highly connected individuals as observed. The observed interactions had, on average, an intermediary weight (mean $w_{ij} = 0.40 \pm 0.39$), but

17 pairs of individuals show maximum weight ($w=1$), indicating long-term interaction between individuals. On average, two links separate two randomly selected individuals, indicating that there is a small path connecting any pair of individuals (2.06 ± 0.85 links). In fact, the largest recorded path between two individuals was 4 links. The average clustering coefficient of the killer whale network, $C=0.32 \pm 0.07$, was not different from expected for a random network with the same number of nodes and links ($C_R=0.28$). However, this is a result of the masquerading effect of five individuals that show very small clustering ($C_i=0.17$). The majority of individuals (32 individuals, 88.3%) are part of cohesive groups $C_i > C_R$, whereas in a random network, we should expect that only 50% of the individuals will show $C_i > C_R$. The probability that a random network with the same number of individuals and links as that of the killer whale network has at least 32 individuals with $C_i > C_R$ is <0.00001 , suggesting the killer whale network shows small-world properties combining small path length and high clustering.

We found that the killer whale social network showed a strong potential for the emergence disease outbreaks. In simulations assuming that all individuals are susceptible to the simulated diseases, up to 90% of individuals were infected. The fraction of individuals infected is higher than 50% even if 20% of individuals are immune to the disease. Thus, our results support the relevance of the interplay between topology and dynamics of social interaction for the spreading of infectious diseases in the killer whale community.

Discussion

Our results suggest that a large fraction of the killer whale population studied may be affected by a disease spreading through the social interactions between individuals. The failure of theoretical networks in which links are equivalent and/or distributed randomly among individuals to lead to similar patterns of disease dynamics suggests that the observed vulnerability is a consequence of the combined effects of both the distribution and the interaction strength of social links in killer whales. In the context of the conservation of mammal-eating killer whales, our study suggests that even species in which individuals live in seemingly small and isolated groups interacting with a few individuals may be threatened by disease outbreaks that may affect almost the entire population. Although there is no available data to test our predictions, there are a wide variety of pathogens that attack killer whales; the population shows high levels of contamination by PCBs, increasing the vulnerability of individuals to diseases generally; and populations of other top predators have been extirpated or driven to extinction by pathogens. It is important to note that in natural conditions the transmission of disease is probably compensated by the benefits derived from social interactions such as hunting efficiency and food sharing; however, the same may not be true in reduced populations in which the immunity of individuals is already challenged by contaminant loads or facing recently introduced pathogens.

The observed deviation between the predictions of classical epidemiological models and our simulations reinforce the

importance of topology for dynamics within complex networks. Previous studies focusing on the spread of disease in human social networks propose that biased policies toward certain groups of individuals may be more efficient to control disease outbreaks. In mammal-eating killer whales, our results suggest that individuals that show strong interactions with a number of individuals are likely to be the most important to the observed epizootic dynamics. Thus, special attention should be devoted to mature females, since they are likely to associate with a number of individuals and establish long-term interactions with their offspring, even after the individuals disperse from the original group. These strategies should be associated with the identification of potentially dangerous pathogens and to the continuous monitoring of health conditions of individuals in order to detect epidemics at early stages. We emphasize that the approach described here may also help to provide new insight into the vulnerability of other social mammals. Because of the importance of top predators such as mammal-eating killer whales to the long-term maintenance of ecological communities, we suggest that future studies should focus social, endangered top predators that are likely to be threatened by epizootics.

2008 UPCOMING MEETINGS

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| Feb 25-28 | Second International Conference on Health and Biodiversity. Galway, Ireland. Abstract submission deadline January 11th, registration deadline February 8th. For more info go to www.cohabnet.org/cohab2008/index.htm . |
| Mar 16-19 | 2008 International Conference on Emerging Infectious Diseases. Hyatt Regency, Atlanta, GA. Pre-registration deadline 2/28/08. For more information visit www.iceid.org . |
| Mar 28-30 | 6th Annual Southeast and Mid-Atlantic Marine Mammal Symposium. Charleston, South Carolina. Highlighted this year will be conservation medicine and its applications to marine mammal research and management. Deadline for abstracts is February 1st, 2008. For more info go to www.musc.edu/mbes/seamamms/ . |
| Apr 22 - 25 | Florida Marine Mammal Health Conference III. The Whitney Laboratory for Marine Bioscience, Marineland, Florida. Abstracts invited, deadline January 10, 2008. For more information go to www.conference.ifas.ufl.edu/marinemammal . |
| May 12-15 | Perigrine Fund Conference on Ingestion of Spent Lead Ammunition. Boise State University, Boise Idaho. Deadline for abstracts and early registration March 1st, 2008. For more info go to www.peregrinefund.org/Lead_conference/default.htm . |
| Jul 27-31 | 29th World Veterinary Congress. Vancouver, British Columbia. For more info see www.worldveterinarycongress2008.com . |
| Aug 3-8 | Joint Conference of the AAWV and WDA. University of Alberta, Edmonton, Alberta. For more info go to www.biology.ualberta.ca/parasites/WDA08/ . |

Spongiform Encephalopathy in a Cheetah

From ProMED (edited), Sept. 2007

A cheetah at a zoo in Nuremberg has been identified as the first confirmed case of feline spongiform encephalopathy (FSE) in Germany. According to the Nuremberg city government, Lulu, a female cheetah born in 1998, had suffered for six weeks from symptoms including ataxia and weakness before she was ultimately euthanized. Post-mortem tests by Bavarian and federal labs were positive for FSE.

It was unclear how and when Lulu became infected with the disease, which has a several-year incubation period, but Nuremberg authorities said it likely happened in the Netherlands where she was born. She moved to Germany at the age of 15 months, returned to the Netherlands five years later, and arrived at the Nuremberg zoo in March 2006. No FSE cases had been detected at the two previous zoos in which she lived.

FSE was initially identified by the Bristol Veterinary School in 1990, and was the first indication that bovine spongiform encephalopathy (BSE) is capable of crossing the species barrier. Since then, about 100 cases have been registered in domestic cats, most of them in the UK. This problem has been addressed by measures preventing the inclusion of BSE-suspected material in commercial cat food.

Sporadic cases of FSE in captive wild felidae exposed to BSE infection when fed infected bovine offal and manifesting clinical FSE after a lengthy incubation period have been registered in several countries. A total of 22 cases have been confirmed in exotic felidae between 1992 and 2007 (Asian leopard cat [3 cases], cheetah [5 cases], lions [5 cases], ocelot [3 cases], puma [3 cases], and tiger [3 cases]). Both the Netherlands and Germany were infected by BSE during the years 1998-1999, and it is probable that the exposure of the cheetah in this report took place during its first year of life in the Netherlands. Cases of FSE can still be expected in adult felidae brought up in BSE-infected countries during their young age.

Aggressive Algae Killing Costa Rican Coral Reef

From ProMED (edited), Aug 2007

The tropical algae *Caulerpa sertularioides* is killing one of Costa Rica's most important coastal reefs. The green, feather-like algae is spreading along the reefs of Culebra Bay in Costa Rica's northwestern Gulf of Papagayo, a popular diving spot and home to a rare species of coral. Although the algae appears native to the Caribbean where previously it has not caused a problem, climate changes and water changes may have altered that previous non-problematic state: a tourism and construction boom along the palm tree-lined beaches is creating nitrogen- and phosphate-rich waste that feeds the algae and allows it to proliferate out of control.

"It's an ecological disaster," said Cindy Fernandez, a marine biologist with the nonprofit MarViva Association, who alerted the Costa Rican government to the threat, which is now being taken on by the state-run University of Costa Rica.

About 80 percent of the reef area, which stretches for about a mile and a half along the coast line, is covered in the algae. It forms continuous meadows from the surface to more than 30 meters deep (and has been found in water to 100 meters deep), blocking sunlight and suffocating the reefs. The aggressive algae reproduces by fragmentation (sexual reproduction has not been observed at 10 meter depth) and spreads when even the smallest sliver comes loose from strong currents or dive boats dropping anchor, rooting itself in another part of the reef. Even the sweep of a diver's hand or the kick of a diver's fin can break off a fragment to start another patch. This makes it difficult, if not impossible, to eliminate it by physical removal. "If you pull it up it will reproduce faster," said Jenny Asch, coordinator of the government's marine conservation program, who is leading efforts to find a way to eradicate the algae.

A very similar highly invasive Mediterranean species of algae, *C. taxifolia*, was discovered in Southern California in June 2000, where scientists have used solid chlorine blocks to aid in eradication. Costa Rican scientists do not yet know if similar techniques will work on *C. sertularioides*. If left unchecked, the algae could severely damage the ecosystem of the bay, allowing non-native species of fish to come in and displace the native species.

The algae is the latest challenge facing Costa Rican authorities as the Central American country struggles with conserving its unique tropical biodiversity while attracting tourists and marketing itself as an ecotourism paradise.

EMPLOYMENT OPPORTUNITIES

Assistant Professor in Ecotoxicology

The Donald Bren School of Environmental Science & Management seeks a scientist in ecotoxicology whose work is clearly relevant to environmental policy or management.

The successful candidate will have interests in investigating the effects of chemical stressors on organisms in the context of ecological systems and in applying scientific research to issues of environmental management. Applicants should possess a Ph.D. or have completed all requirements for the degree by the appointment date. A strong background and experience in using innovative methods in molecular biology, chemistry, and ecology to conduct empirical studies of interaction mechanisms between stressors and organisms is desired, as is the ability to both teach and mentor Masters and Ph.D. students. Preference will be given to candidates whose existing or emerging research is complementary to existing areas of emphasis within the School, including corporate environmental management, ecological sustainability, environmental economics, governance for sustainable development, and sustainable management of water resources.

For more information contact the Ecotoxicology Search Committee, Donald Bren School of Environmental Science and Management, University of California, Santa Barbara, CA 93106-5131; e-mail ecotox@bren.ucsb.edu FAX (805) 893-7612. The position will remain open until filled.

EMPLOYMENT OPPORTUNITIES

Clinical Parasitology Faculty Position - Univ. of Wyoming

The University of Wyoming Department of Veterinary Sciences and Wyoming State Veterinary Laboratory (WSVL) are seeking a clinical parasitologist for a full-time tenure-track position in the Department of Veterinary Sciences at the assistant professor level. Responsibilities of this position will entail approximately 37% commitment to professional service in the WSVL, 30% teaching and advising, 28% research, and 5% extension, University and public service. Qualifications may vary and include a DVM with a minimum of 3 years specialized training and/or experience in clinical and research parasitology, and/or a PhD in parasitology (preferably veterinary) with similar clinical and research experience. Special emphasis is placed on diseases that occur at the wildlife/livestock interface and companion animals. Teaching responsibilities include upper-level parasitology courses and medical parasitology. The successful candidate will also have the combined knowledge and/or experience to supervise the WSVL diagnostic parasitology service, providing consultation and diagnostic laboratory services to veterinarians, livestock and companion animal producers and owners, wildlife agencies and state and local governments in the northern Rocky Mountain region.

Interested parties should submit a letter of application, curriculum vitae, and the names and contact information for three references to Dr. Merl Raisbeck, c/o Ms. Beth Howell, 1174 Snowy Range Road, Laramie, WY 82070. Electronic submission is greatly preferred (bethlee@uwyo.edu). The application letter should indicate the applicant's short and long term goals regarding both research and teaching and outline his/her qualifications for the position described. Review of applications will begin December 1, 2007 and continue until the position is filled.

Staff Veterinarian - Wildlife Center of Virginia

The Wildlife Center of Virginia is currently accepting applications from experienced wildlife veterinarians. The Wildlife Center is an internationally acclaimed teaching and research hospital for wildlife medicine, providing clinical care to 2,500 patients annually, training veterinary students and professionals from US and international veterinary schools, and leading development of new strategies for wildlife disease surveillance.

In addition to clinical responsibilities, the successful candidate will also play a supervisory and mentoring role to volunteers, interns, and staff; be involved in research projects that advance wildlife veterinary medicine; and serve as a spokesperson for the Wildlife Center with the media, professional organizations, and wildlife rehabilitators.

Requirements include DVM [VMD] from an accredited veterinary school; eligibility for licensure in Virginia; and clinical experience in wildlife medicine. Send cover letter, resume, and salary expectations to Office Manager, P.O.Box 1557, Waynesboro, VA 22980 or email to humanresources@wildlife-center.org.

Staff Veterinarian - Willowbrook Wildlife Center

Responsibilities include supervising animal care staff, clinic volunteers, and students; providing routine and emergency medical care to the animal collection; diagnosing and treating injuries and illnesses through physical examinations and lab tests; performing euthanasia and postmortem examinations as needed; maintaining and ordering medical and surgical inventory and equipment; and communicating with staff, volunteers, and public about rehabilitation medicine and environmental and human health issues. The successful candidate will have at least one year's experience as a supervising veterinarian. Experience with wild animals and wildlife rehabilitation is preferred. Hiring salary is \$52,502 - \$55,000. For more information, contact Kathy Fosser at 3 S. 580 Naperville Rd., Wheaton, IL or go to www.dupageforest.com/employment/employment.html.

Tenure-track Faculty Position in Wildlife Health Ecology - University of Calgary Faculty of Veterinary Medicine

University of Calgary Faculty of Veterinary Medicine (UCVM) will be Canada's fifth accredited veterinary college and will accept its first class of thirty students in September 2008. The UCVM program will deliver a comprehensive general veterinary education and provide enhanced educational opportunities in production animal health, equine health, ecosystem and public health, and investigative medicine. Descriptions of the Faculty and its departments can be found on the UCVM website (www.vet.ucalgary.ca).

Successful candidate for the faculty position in Wildlife Health Ecology will be expected to contribute to teaching in the undergraduate DVM and graduate programs and to develop an externally funded research program. Individuals with expertise to address issues at the wildlife, domestic animal, and human interface are encouraged to apply. Research interests in the ecological determinants of health, development of predictive models for the transmission dynamics of infectious disease agents in complex multi-host systems, applying GIS and statistical inferences on spatial and temporal data, and those that address the cultural, social, behavioral, and economic dimensions of wildlife health are considered highly desirable.

Qualifications include a PhD in wildlife health or disease ecology or in a related field of ecology. A DVM is desirable but not essential. Review of applications will begin December 1, 2007 and continue until the position is filled. Interested individuals should submit a curriculum vitae, a statement of teaching and research interests, and the names of three referees to Dr. Bonnie Buntain, Faculty of Veterinary Medicine, 3330 Hospital Drive N.W., Calgary, AB, Canada T2N 4N1, or email vet-dean@ucalgary.ca.

AAWV and AAZV Jointly Support a Ban on Bear Farming in China

Earlier this year, the joint AAWV/AAZV Committee on Wildlife Health and Conservation wrote the following letter in support of a call by the Animals Asia Foundation (AAF) to ban bear bile farming as part of the practice of Traditional Chinese Medicine. Then-AAWV President Kirsten Gilardi and AAZV President Ed Ramsay co-signed this letter on behalf of their respective organizations.

At the request of the AAF, the AAWV and the AAZV join experts in China and across the world in encouraging China to rise to the challenge of leadership by declaring an end to the practice of bear bile farming.

The world is fascinated with China's remarkable socio-economic progress in recent years. As the country develops into a global leader of economics, industry, and science, it gains the responsibility to serve as a model of ethical responsibility and environmental stewardship. China demonstrates its potential for greatness in many ways, one of which is its signature to CITES regulations for the protection of endangered species. The bear bile industry seriously compromises this commitment by exploiting and abusing endangered species that are native to China and that are listed in CITES Appendix I and the IUCN Red List.

We are experts in veterinary medicine, animal husbandry, and animal welfare. We agree, without question, that bear bile farming is not acceptable by the global standards of our discipline. Our conclusions are based on evidence gathered by the Animals Asia Foundation as a result of 10 years of research of China's bear bile farms, together with its veterinary medical evaluation and rehabilitation of more than 200 bears that AAF has rescued from bear farms.

With due respect for traditional Chinese medicine (TCM), the use of bear bile is outdated and superfluous. This is the conclusion of experienced and highly respected practitioners of TCM in China. These practitioners refer to the choice of more than 50 herbal products in the TCM pharmacopoeia that are indicated for the treatment of conditions for which bear bile is just one – and often not the best – alternative.

We conclude that the farming of bears for bile extraction:

- violates every principle of animal welfare as recognised by countries across the world and within Chinese society;
- is inhumane by all possible criteria;
- causes acute, chronic and life-threatening medical complications in the bears;
- results in severe psychological trauma to the bears; and
- may have exacerbated the market for wild bear gall and may consequently have increased poaching of bears throughout Asia and North America.

We recognize that, for bear farming to end, there are needs to be addressed in terms of animal husbandry, labor reorganization, and increased production and distribution of herbal medicines and preparations that are bear bile replacements.

With the 2008 "Green" Olympics in Beijing drawing near, we believe that the majority of people in China no longer wish to tolerate the bear farming industry in their country. Moreover, we believe that China will gain great respect in ending an industry which conflicts so greatly with the green message of protecting the country's diverse and precious flora and fauna. We are looking to China to take its place at the forefront of global leadership and environmental stewardship by declaring an end to bear farming.

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