

SUPPLEMENT TO THE JOURNAL OF WILDLIFE DISEASES

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President's Corner

What a difference a day makes! Or . . . a week, or a couple of months. Publication deadlines necessitate input to the Supplement many weeks prior to your receipt. My last input was submitted prior to September 11th. It's now Thanksgiving time and the world's population will inevitably view all aspects of their lives in new and unimagined ways.

In early September I certainly had no idea I would be addressing the issue of domestic and international terrorism as the major focus of this column. In fact, if many of you perceive things in a manner similar to the way I do, you likely have experienced a degree of "numbness" as a result of the onslaught of media coverage regarding 9/11 and subsequent events. As a result, I contemplated whether I should, or should not, address these issues in this forum. I have opted to briefly address the recent events because failing to do so would be to ignore what may well be one of the major "hinge" events of our lives.

Each of us has varying perspectives regarding the terrorist acts of recent months. Mine are, in part, outgrowths of more than 30 years of involvement with the military biomedical community. More specifically, the death of the wife of one of my closest Veterinary Corps colleagues (she was a civilian budget analyst working for the Department of Defense at the time of the Pentagon attack) has directly impacted me. Supportive phone calls, and a personal visit in an effort to comfort, have kept the issue on the very surface of my awareness. Additionally, nearly daily I see close friends of many years appearing on television as disease, bioterrorism, and chemical defense experts. All are, or have been, members of our military's broad based biomedical research team. In sum, consideration of the possibilities and implications of war induced by terrorists was an element of my life for more than three decades.

When one considers the various agents and toxins headlining most "threat lists", it becomes apparent why those working in both the domestic and wildlife disease arenas are experiencing a remarkably increased level of attention. The twin towers, Pentagon, and Pennsylvania attacks immediately stimulated heightened discussion regarding national and international vulnerabilities to terrorism. There has been a clamor for more detailed information regarding agents on the so called "threat lists". Among viral agents, smallpox, VEE, and viral hemorrhagic fevers dominate such lists. Anthrax, brucellosis, cholera, plague, tularemia, and Q-fever are among the bacterial agents of greatest concern. Biological toxins such as botulinum, staphylococcal enterotoxin B, ricin, and T-2 mycotoxins further lengthen the list of potential biological and chemical agents conceivably available to terrorists.

Not surprisingly, the majority of these agents are either zoonotic or have a significant domestic and/or wild animal component. Individuals having a foundation in wildlife diseases have been, and will continue to be, increasingly involved in collaborative efforts to prepare for, react to, and hopefully prevent domestic bioterrorism. The quest for expanded understanding of the infectious nature of these agents, data relating to comparative lethality, and the need for expanded laboratory capabilities will, inevitably, increase the involvement of wildlife disease specialists worldwide.

The critical importance of the devastating impact foreign animal disease (FAD) introductions into do-

The Wildlife Disease Association does not regard the Supplement to the Journal of Wildlife Diseases (Wildlife Diseases Newsletter) as a citable publication and, therefore, it should not be referenced in the scientific literature.

mestic and/or wildlife populations can have on our economy is, unquestionably, a vital element in the entire bioterrorism equation. Recent animal disease outbreaks around the globe make it clearer than ever that economic instability can result from such events. There is literally a cornucopia of diseases (BSE, CWD, FMD, ASF, VVND, AI, etc.) having the potential to negatively impact industries and economies, be they local, regional, national or international. Certainly many such diseases are not likely tools for the bioterrorist, but enough of them are to cause concern. The potential for the purposeful introduction of FADs has never seemed more real than is currently the case.

As wildlife disease scientists and workers, our potential to serve as early detectors of unusual disease and intoxication events is more important than ever. That same level of importance spills over into the need for enhanced communication with both domestic animal and human health professionals. These principles are difficult, if not impossible, to overstate.

For those of us in the wildlife disease community, our index of suspicion regarding both the "unlikely" as well as the "unthinkable" must remain at the very highest levels. I mentioned in my first contribution to this column that "The next year promises to bring unforeseen challenges, new excitement, and unlimited opportunities to excel within the wildlife disease arena." The events of the past few months have assured that will be true.

I do hope that all of you had a joyous holiday season. I also hope that as many of you as possible are making plans to join us in Humboldt, California this next summer. As the WDA enters its second half century as an association your presence and involvement becomes ever more vital to our relevance and our success.

- Paul L. Barrows, WDA President

WDA ACTIVITIES

51st Annual Meeting of the Wildlife Disease Association. Theme: Preparing for Emerging Diseases. The 51st Annual Conference of the WDA will be held **28 July to 1 August 2002** at the Redwood Coast Conference Center, Humboldt State University (HSU), Arcata, California, USA. The Conference Center is situated at the north end of the HSU campus, lying adjacent to the City of Arcata's Redwood Park near Jolly Giant Creek. The conference will be sponsored by HSU's College of Natural Resources and Sciences, and several other agencies and organizations. The Editorial Board and WDA Council will meet on Sunday, 28 July, prior to the start of the general sessions. On Sunday evening, the Wildlife Health Center (UC Davis) will host a special reception for students at 6 p.m. that is followed by a general welcoming reception for all members at 7 p.m. General sessions will begin on Monday, 29 July and continue through Thursday, 1 August. Social events will include the picnic on Monday, auction on Tuesday, and awards banquet on Wednesday. Please be sure to bring your auction items! Details of the Conference will be forthcoming and regularly revised on the Conference website (www.humboldt.edu/~wda/); additional questions or concerns can be directed to local arrangements co-chairs, Rick Botzler (Tel. 707-826-3724; fax: 707-826-4060; e-mail: RGB2@humboldt.edu) and Rick Brown (Tel. 707-826-3320; fax 707-826-4060, e-mail: RNB2@humboldt.edu).

Participants will be housed at the Creek View or Cypress Halls on the HSU campus. Costs per day are \$54.35 per person for a double and \$61.35 for single occupancy for Creekview, and \$42.05 per person for a double and \$49.05 for a single at Cypress. Room rates include all meals except the picnic and banquet. Housing arrangements should be made directly with the HSU Housing Office (Telephone **707-826-5312**); mention should be made that this is for the WDA Conference. A list of local lodges and motels as well as local state parks and RV parks are on the conference website; copies of this list also can be provided on request from local arrangements chair, Rick Botzler. Participants lodging off-campus will need to purchase their own meals, but are welcome to purchase and share their meals with other participants at the HSU dining facilities; the Welcoming reception and all coffee breaks are included as part of the registration fee. Planned field trips tentatively include an offshore trip on HSU's research vessel, Coral Sea, a whitewater rafting trip, and a tour of the Redwood National and State Parks.

Two airline carriers, United and Horizon Air, serve the Eureka/Arcata Airport. Because of the limited number of flights arriving and leaving the airport, **it is very important to make your travel arrangements as early as possible.** Three rental car companies (Avis, Hertz, National) serve the airport. Also, availability of shuttle service to and from the airport will be posted on the website once arrangements are made.

Call for Papers. Requests to contribute a paper at the 2002 WDA conference, as well as the accompanying abstracts, should be received no later than **Friday, 3 May 2002**. Please send the abstract via electronic mail to the Program Chair at: WDA@ucdavis.edu. If electronic mailing is not possible, please send a copy of your abstract in ASCII format on a computer diskette along with your printed copy to the Program Chair at the address below. Please include the names and complete addresses for all authors on the abstract and underline the individual presenting the paper, following the format of the attached sample abstract. Abstracts should be no longer than 2 full pages including title, authors and addresses (please

use 12 point font). Longer abstracts may be edited. Indicate whether you prefer to present your paper during a platform session, as a poster presentation, or if either option is acceptable. Abstracts of papers being submitted for the student competition should be clearly identified as such, and a copy also submitted to the Chair of the Student Activities Committee. **Please note that the deadline for submission of abstracts for student scholarship and research awards to the Student Activities Committee is 15 April 2002** (see Student Activities announcement). Oral presentations will be limited to a maximum of 15 minutes. A presentation of approximately 12 minutes is recommended to allow time for questions and discussion at the end of each presentation. In fairness to others, please plan for the time allotted. Carousel 2 x 2 inch slide projectors and an LCD projector connected to an IBM-compatible computer with PowerPoint 2000 will be provided. Slides or PowerPoint presentations (on a floppy disk, zip drive or CD) should be given to the session's projectionist at the beginning of your session. It is the author's responsibility to have the slides loaded into the carousel correctly or appropriately formatted for the available computer. If other audiovisual equipment is needed, please request these when the abstract is submitted.

Special sessions are being planned on "Preparing for Emerging Wildlife Diseases" and "Diseases of Wild Sheep". If you wish to present during either of these sessions it is especially critical that you submit your abstract early. Submit abstracts to the Program Chair, Dr. Michael Ziccardi, at the Wildlife Health Center, University of California, Davis, CA 95616 USA. Phone: (530) 752-4167; Fax (530) 752-3318; Abstract E-mail: WDA@ucdavis.edu; Program Chair E-mail: *mhziccardi@ucdavis.edu*

Sample Abstract

DETECTION OF THE CAUSATIVE AGENT OF DISSEMINATED VISCERAL COCCIDIOSIS (*EIMERIA* SP.) IN SANDHILL CRANES (*GRUS CANADENSIS*) AND WHOOPING CRANES (*GRUS AMERICANA*) BY POLYMERASE CHAIN REACTION AMPLIFICATION OF 18S rDNA.

SCOTT P. TERRELL, Department of Pathobiology, College of Veterinary Medicine, University of Florida, Gainesville, FL 32610; SUSAN E. LITTLE, Department of Medical Microbiology and Parasitology, College of Veterinary Medicine, University of Georgia, Athens, GA 30602; MARILYN G. SPALDING, Department of Pathobiology, College of Veterinary Medicine, University of Florida, Gainesville, FL 32610; CALVIN M. JOHNSON, Department of Pathobiology, College of Veterinary Medicine, University of Florida, Gainesville, FL 32610.

Disseminated visceral coccidiosis (DVC) is a disease characterized by the presence of disseminated lymphohistiocytic inflammatory lesions in sandhill cranes (*Grus canadensis*) and whooping cranes (*Grus americana*). The etiologic agent of DVC is a coccidian parasite of the genus *Eimeria*. Currently, diagnosis of this disease requires microscopic identification of the *Eimeria* parasite in tissue samples. However, microscopic identification of this parasite is often difficult due to the small numbers of organisms present or severe autolysis of field-collected specimens. A polymerase chain reaction (PCR) based assay was developed to detect *Eimeria* spp. DNA in frozen tissue samples from cranes known or suspected to have DVC. The PCR assay successfully detected *Eimeria* spp. DNA in tissue lesions known to contain coccidial organisms and also detected DNA in highly suspicious lesions in which organisms were not microscopically visible. Tissue samples that did not contain lesions consistent with DVC and tissue samples from uninfected control birds did not produce a positive result with the PCR assay. This work provides a useful diagnostic tool, the PCR assay, to confirm the presence of coccidian DNA in tissue lesions suspected to be the result of DVC.

WDA Student Activities.

Guidelines for the 2002 WDA Student Awards.

Wildlife Disease Graduate Student Research Recognition Award: DEADLINE: April 15, 2002.

This award is given to the student judged to have the best research project in the field of wildlife disease, based on written communication and scientific achievement. The winner receives a plaque and up to \$1000 US to cover travel, housing, registration, etc. related to the annual conference. The student will be the featured presenter during the Student Presentation Session at the conference.

Applicants should submit three items:

1) A summary of their research (10 pages double spaced written in type face font 10 or larger) structured as follows: Title, abstract, introduction, methods, results, discussion, references, tables and figures. The title page should be separate, and the 10-page limit applies only the Title, abstract, introduction, methods, results, and discussion. **PLEASE ENCLOSE 3 COPIES.**

2) A cover letter stating how the research relates to WDA objectives (see inside back cover of WDA journal).

3) A letter of support from the faculty advisor indicating degree of student involvement in planning and execution of the research project.

Selection criteria: Each item (1–3) will receive a score and the sum of these scores will determine the rank of the candidate.

GROUND FOR DISQUALIFICATION INCLUDE:

- Items missing.
- Summary exceeds 10 pages (excluding tables, figures, and references).
- Submissions postmarked beyond deadline date.

Wildlife Disease Association Scholarship: DEADLINE: April 15, 2002. This scholarship acknowledges outstanding academic and research accomplishment, commitment, and potential in pursuit of new knowledge in wildlife disease or health. The scholarship has a value of \$2000 US and is awarded annually to an outstanding student who is pursuing a master's or doctoral degree specializing in research on wildlife disease.

To be considered, the candidate must have completed a four-year baccalaureate degree. Candidates with an overall grade point average of 3.5 or above in 4.0 system or 80% or better in percentage system will receive priority. The candidate should be committed to leadership, scholarship, and service in the wildlife health profession. To be considered, you should submit the following items:

- 1) One *Original* and two *photocopies* of all relevant transcripts. *Original* transcripts means: Official transcripts (i.e. with the imprint or official seal of the institution and signature of the responsible university officer) or copies signed by the student's faculty advisor.
- 2) 3 copies of a single page giving cumulative grade point average for all undergraduate degrees, graduate degrees, and ongoing coursework.
- 3) Up to 3 letters of support, including a letter from the student's faculty advisor, that address the following specific abilities of the applicant: academic achievement, scholarly promise, research ability, verbal and writing skills, industriousness, leadership abilities, judgment and potential for contribution to the field of wildlife diseases.
- 4) Evidence of superior scholastic achievement (course work, scholarships, awards, publications)

GROUND FOR DISQUALIFICATION INCLUDE:

- Items missing.
- Submissions postmarked beyond deadline date.

Terry Amundsen Student Presentation Award DEADLINE: May 3, 2002. This award acknowledges outstanding oral presentation of research findings. Winner receives \$250.00 and a plaque. To be considered, the student must give an oral presentation (13–15 min) of their topic of choice to the WDA meeting participants. To enter, submit an abstract by May 3, 2002 as specified in the "Call for Papers" in this issue of the *Supplement*, AND submit a copy of the abstract to Dr. Work at the address below. Upon completion of the presentations, evaluation forms will be handed out to the audience who will be asked to score the presentations for the following:

- Quality of science
- Quality of visual aids
- Delivery
- Relevance to management of wildlife health

The student with the highest score will receive the award. Members of the WDA Student Activities Committee will adjudicate tied scores.

These awards are non-renewable and can be received only once by a given candidate. Applications must be submitted by April 15, 2002 to: Thierry M. Work, USGS-NWHC-HFS, PO Box 50167, Honolulu, HI 96850, USA (thierry.work@usgs.gov).

WDA ACTIVITIES.

Call for Nominations. This year the Association has several important vacancies. These include: Secretary, Treasurer, two seats on Council, and for the first time, a Student seat on Council. Please consider candidates for these important jobs and send your nominations to Dr. Scott Wright at swright@usgs.gov. The deadline for nominations is May 1, 2002.

Nominations for WDA Awards, 2000. Greetings fellow WDA members. The WDA Awards Committee (Ted Leighton, Thijs Kuiken, and John Fischer) is actively soliciting your input regarding nominations for this year's WDA awards. We are seeking nominations for both the Distinguished Service and Emeritus Awards. The DSA is our Association's highest honor. It recognizes an active member for outstanding

contributions in science, education and other activities including participation in WDA affairs. The Emeritus Award honors a retired member who has made significant contributions to the study of wildlife diseases. Please send nominations to Ted by March 15, 2002. Please include a copy of the nominee's CV. Ted Leighton's e-mail: leighton@sask.usask.ca [Editor's note: A list of the previous winners of these awards can be found in the January 1999 issue of the Supplement. Check the hard copy or the 1999 Supplement posted on the web site.]

Reminder: WDA Web Site Now Password-Protected!! The WDA web site has been partially password-protected to reflect the WDA Council's desire to provide access to some information to WDA members only, as a member benefit. If you are a current member, and have not received the password, and want it, please contact the business office at *WDA@allenpress.com*. The password may be changed annually, and that information will be provided to members.

OTHER MEMBER NEWS



Remembering Roy: Roy C. Anderson, 1926–2001

The Wildlife Disease Association lost a long-time member and valued colleague August 27 when Roy C. Anderson died unexpectedly. Roy is survived by his wife Phyllis, sons Douglas and Mitch, and granddaughters, Jennifer and Diana.

Roy was a native of Camrose, Alberta, Canada, a small community on the prairie. Here he grew up with an appreciation of the environment and the wildlife that inhabited it. While in high school, Roy became an avid “birder” and learned to recognize birds by sight and by sound. He indulged this hobby throughout his life. After graduation from high school, Roy entered the Navy and during the latter part of World War II, he and his shipmates escorted vessels from the U.S. border to Newfoundland. After the war, he married, and enrolled at the University of Alberta. Upon graduation (1950), Roy went to the University of Toronto where he became a student of Dr. A. Murray Fallis. His Ph.D. research was conducted in Algonquin Park and dealt with the filarioids of birds. After receiving the Ph.D. in 1956, he did post-doctoral studies at the London School of Hygiene and Tropical Medicine and at the University of Paris. Roy then returned to Canada where he became a member of the staff of the Ontario Research Foundation (1958) and later (1965), the faculty of the then fledgling University of Guelph where he remained.

His considerable service to wildlife disease and parasitology included terms as President of the Wildlife Disease Association (1981–83), President, Canadian Society of Zoologists (1975–1976), Vice President, American Society of Parasitologists, Associate Editor, Canadian Society of Zoology (1968–78), Assistant Editor, *Journal of Parasitology* (1968–72), Co-Editor, *Systematic Parasitology* (1978–2001), Editorial Board, *Journal of Wildlife Diseases* (1975–85), as well as repeated service as Councillor, Committee Member and Convenor of Annual Meetings for the above professional societies.

Roy received many honors including the Henry Baldwin Ward Medal (1968) and the first Mentor Award (1997) from the American Society of Parasitologists, the Distinguished Service Award (1978) and Emeritus Award (1993) from the Wildlife Disease Association, the Wardle Medal (1988) and Honorary Member, Parasitology Section, (1998) of the Canadian Society of Zoologists, and he received the Director's Award and received a lifetime membership in The Friends of Algonquin Park (1992).

Roy retained his love for the environment throughout his life and was an avid camper and outdoorsman. He encouraged his students to present papers at local and national meetings and often chose to drive with his students to scientific meetings and camp along the way. He had a great sense of humor, which contributed to his success as a teacher and mentor. Roy supervised 14 M.Sc. and 15 Ph.D students as well as 5 post-doctoral fellows.

He was the sole, co-author, or main advisor, of 269 peer-reviewed scientific papers. Included in these were descriptions of 81 new species and 8 new genera. The 10-volume C.I.H. keys to the Nematodes (edited with Drs. A. Chabaud and S. Wilmot) set a new standard for nematode classification. He also authored or co-authored 11 chapters in books and 5 books including most recently, the *Nematode Parasites of Vertebrates—Their Development and Transmission* (CABI Publishing, 2nd edition (2001)). This classic work, which reviews the known biology of almost 600 species of nematodes and lists 3200 references, will not be improved upon for a good many years.

Much of Roy's research dealt with the filarioids and acuarioids of birds, but among wildlife disease professionals, Roy was best known for his work with meningeal worm (*Parelaphostrongylus tenuis*) of white-tailed deer. Several years ago, Roy recounted the history of the discovery of meningeal worm as a cause of neurologic disease in moose.

"Just before I left for Europe in the fall of 1956, I examined nematodes from the cranium of deer and identified them as *Elaphostrongylus odocoilei* (Anderson, 1956). On return from Europe I planned to study the biology of *Diectophyma renale*, which is common in mink, carcasses of which I could get from a trapper friend. In these animals I found lungworms and I worked out their biology. This gave me a lot of experience in working with lungworms, which was very useful when I turned to those strange worms in the cranium of deer. I set out in 1962 to elucidate the life cycle of *P. tenuis*.

I decided to make two assumptions as a start to this program of study. Firstly, larvae I'd found in faeces of deer in Algonquin Park belonged to the cranial worms (in retrospect a dangerous assumption which, however turned out to be correct). Secondly, that the worms might develop in the central nervous system; this would focus our research to a specific region of an animal as large as a deer. The assumption was based on the existence of "*Neurofilaria*" in sheep. Also, there was interest at the time in CNS nematode infections. Sprent (1955) had published a couple of reviews but his examples were dominated by ascaridoids and other accidental and aberrant infections. More significant was the discovery of the neurotropic behaviour of *Angiostrongylus cantonensis* (now *A. mackerrasae*) of rats as worked out by Mackerras and Sanders in Australia in 1955. Here was a genuinely neurotropic nematode. I hypothesized that *P. tenuis* was also a neurotropic form and that is why I concentrated from the beginning on the CNS.

I exposed various gastropods to larvae from the faeces of deer and soon had plenty of third-stage larvae, which I gave orally to four fawns. I chose necropsy dates of 25, 40 and 50 days for three animals and waited for patency in the fourth. This was a lucky choice because at 25, 40 and 50 days we had no difficulty finding developing worms in the pressed, fresh tissue of the spinal cord (we also did the brain but only one worm was there). The fourth fawn was passing larvae 91 days post-infection and was killed 115 days post-infection for a detailed histologic study. Numerous adult worms were in the cranium, many in blood vessels. This study showed that eggs reached the lungs in the blood and blocked lung capillaries. Nodules formed around the eggs and the latter embryonated to first-stage larvae, which burst from the nodules and passed through the respiratory system, were swallowed and passed in faeces.

In 1964 (after discovery of the cause of moose sickness) I infected fawns again and this time conducted a painstaking histological examination of the CNS 10, 20, 25, 30 and 40 days post-infection. These studies revealed in detail the site of development and the migration of worms into the subdural space. This work appeared in 1965.

At the time there was increased interest in moose. Randolph Peterson's book appeared in 1955 and articles were published throughout the 1950's on "moose sickness" in the Maritimes. Pimlott was writing articles on moose and moose management. I can't recall exactly but it seems to me there was renewed interest in the late 50's in the problem of moose sickness and declines in moose populations in the maritime and Minnesota apparently associated with disease. Various hypotheses had been proposed: tick paralysis, bacteria, viruses, and deficiencies.

One day I was reading about filarioids when I came across articles by Innes and Shoho describing work done by the latter in China and Korea during the war. These articles appeared in the early 1950's and I was struck by their novelty. The filarioid, *Setaria digitata* an abdominal parasite of cattle, when transferred by mosquito intermediate host to horses causes paralysis in the latter because the worm invaded and damaged the CNS. This looked like a genuine case of neurotropism of a parasite in a poorly adapted host, and it suddenly occurred to me that maybe moose disease was caused by a parasite like *P. tenuis*.

To check this hypothesis I plotted on a map all the reported cases of moose sickness. It showed clearly that the only places in eastern North America (or anywhere in North America) where the disease occurred were where populations of moose and white-tailed deer overlapped. The negative data of Newfoundland and Isle Royale, where moose had been studied intensively for years, was very suggestive since neither has white-tailed deer.

I got two moose calves and we reared them until they were about 3 weeks old before giving them larvae. The calves developed the typical severe clinical signs seen in wild moose with the disease, and necropsy and histologic evidenced confirmed the clinical observations.

In January of 1965 we obtained from the Kenora district in Ontario the head and vertebral column of three moose exhibiting serious clinical signs. Detailed histological examination of the CNS revealed *P. tenuis* and the traumatic lesions typical of the disease in all three animals."

Thus an enigma that had puzzled science for over 30 years was resolved.

- Submitted by Annie K. Prestwood, Professor Emerita, College of Veterinary Medicine, The University of Georgia, Athens, GA and Murray W. Lankester, Professor, Lakehead University, Thunder Bay, ON.

HAPPENINGS IN THE FIELD

Biosecurity Alert. The recent attacks within the United States have heightened concerns for further malicious acts involving infectious disease agents. On September 11, 2001, the United States Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) warned of "the potential for additional acts which may impact the national security" and issued an Emergency Management Notice emphasizing the need for increased foreign animal disease surveillance. This notice was forwarded to persons involved in animal health and animal industry groups, as well as to all state and territorial wildlife management agencies of the United States. Furthermore, several states have issued notices to veterinarians and animal producers to be alert for unusual health problems in animals and to report suspicious activities to local law enforcement agencies.

The people most closely associated with domestic and wild animals through work or play, i.e., producers, veterinarians, wildlife managers, and sportsmen, serve as the first line of defense when a foreign animal disease is accidentally or intentionally introduced. Early recognition and response offer the best chance for eradication before a small disease problem grows into a large one, and prompt reporting of suspicious or unusual conditions can make all the difference in our ability to swiftly diagnose and control a disease. Signs to watch for include sudden and unexplained deaths in a herd or flock, severe illness affecting multiple animals, central nervous system disorders, unusual ticks on animals, and blisters on an animal's mouth tests or hooves. In the United States, suspicious cases should be reported immediately to the office of the State Veterinarian and to the APHIS Area-Veterinarian-in-Charge for the state.

- Adapted from *SCWDS Briefs, Vol. 17 (3); October 2001.*

USDA Declares CWD Emergency. On September 21, 2001, The U.S. Secretary of Agriculture, Ann M. Veneman, issued a declaration of emergency concerning chronic wasting disease (CWD) in captive elk. The declaration will allow the USDA's Animal and Plant Health Inspection Service (APHIS) to obtain \$2.6 million in special funds to purchase positive and exposed captive cervids from CWD-infected or exposed herds, enhance surveillance and diagnostic testing for CWD, and increase training for producers and veterinarians. Among captive cervids, CWD has been identified only in elk; however, the program will be broad enough to include other captive cervids if needed. According to the USDA's announcement, there are at least 2,300 herds totaling 130,000 captive elk in the United States. In recent years, CWD-infected animals have been found in 16 captive elk herds in Colorado, Montana, Nebraska, Oklahoma, and South Dakota. Currently, seven of these known exposed herds, totaling approximately 1,400 elk, remain under quarantine; the others have been depopulated. However, the full extent of infection in farmed elk in the United States is unknown because there is no live animal test, there has been extensive animal movement, and the incubation period for CWD is measured in months and years.

Elk farming, considered a livestock industry by the USDA, has been seriously threatened by CWD. Restrictions have been imposed by many states on intrastate movement of live animals, and there is concern that public perception of potential health risks to people or traditional livestock could destroy markets for elk and deer products in the United States and abroad. Canada has closed its borders to U.S. cervids, and Korea, which is a huge market for elk antler velvet, has announced that it is temporarily suspending importation of deer and elk products from the United States and Canada.

The emergency funds obtained by the USDA will be useful in combating this disease in the captive elk industry. In particular, indemnity funding will facilitate the depopulation of infected or exposed elk herds that have not been destroyed because of the huge economic losses that would have been borne by their owners. Under the program, owners will receive up to \$2,000 per elk destroyed, with the price based on the quality of the animal. Approximately \$2 million of the new funding will go for indemnity. The funds will provide the backbone for the proposed CWD control and eradication program that has been developed by APHIS for the captive elk industry. The proposed program will involve monitoring of elk herds over time and ultimately allow unaffected herds to be declared CWD free.

A strengthened federal presence in the battle against CWD in the captive elk industry is an important step toward reducing the risk of spreading the disease to susceptible wild deer and elk throughout the nation. Currently, CWD is endemic in wild deer and elk in southeastern Wyoming, northeastern Colorado, and southwestern Nebraska. However, there has been substantial potential for spread of CWD through movement of infected or exposed elk as the captive elk industry developed. Exposure of susceptible wild cervids through association with escaped captive elk, fence-line contact with captive elk or actual intrusion of native cervids into elk pens has been proving the "perfect recipe" for CWD introduction.

Prompt removal of all known CWD-infected or exposed captive elk herds will be a positive step in protecting this nation's valuable free-ranging deer and elk resources, and wildlife managers should embrace this action. However, the federal cleanup of CWD in captive elk will entail hard work, large expenditures of tax money, and considerable personal hardship among captive elk owners. Therefore, one possible sequel to the CWD program could be greater pressure on the agencies that manage free-ranging cervids to control CWD. Failure of state fish and wildlife agencies to take all possible measures to contain CWD could result in a call for agriculture agencies to state setting regulations that apply to wildlife activities such as harvest regimes and restrictions on wildlife relocation.

- *Vic Nettles; SCWDS Briefs, Vol. 17 (3), October 2001.*

National Wildlife Health Center's Quarterly Mortality Report

Avian Botulism and Related Die-offs on Lake Erie. Wildlife and Park managers began seeing dead birds, mostly gulls, on the north and south shores of Lake Erie in late June 2001. Hundreds of gulls, primarily ring-billed, but also black-backed and herring gulls, have been found dead along the shores. Double-crested cormorants have also been found dead in moderate numbers. Many of the dead birds have tested positive for type E botulinum toxin, and one was positive for type C. Thousands of fish of at least six species, including freshwater drum (sheepshead) and sturgeon, have been found sick and dead. The causes of the die-offs in fish have not been determined, but some are thought to be related to storm events and others to algal blooms. In late October, common loons migrated to the north shore and immediately began dying by the hundreds. In previous years, loons have tested positive for type E botulinum; test results are pending at this time.

Botulism and Predation at Horsehead Lake, North Dakota. In early July, Long Lake National Wildlife Refuge began collecting sick and dead birds on Horsehead Lake, a central North Dakota site with a long history of botulism epizootics. During the initial 5 weeks of the outbreak, mortality was primarily observed in eared grebes, blue-winged teal, pintail and mallards, with fewer numbers of shorebirds and colonial nesting birds found. In mid-August, bird mortality dramatically increased with ring-billed and Franklin's gulls as a significant proportion of the total mortality. Five fresh gull carcasses were submitted to National Wildlife Health Center (NWHC) for diagnostic evaluation. Predation and ante mortem trauma by carnivorous millipedes were noted in some birds on necropsy. All 5 gulls tested positive for avian botulism type C toxin suggesting that the ability to avoid avian, mammalian or insectivorous predators was probably compromised.

Botulism in Puerto Rico. Dead and dying herons and egrets were noted in July, 2001, in Arecibo, Puerto Rico. The area is a roosting site for different species of egrets and other water birds. Signs exhibited by sick birds included difficulty flying, turning head to the rear, general debility, no iris response to light change, paralysis of the nictitating membrane, and sick several days before dying. An estimated 300 birds died during this event. No events of this type had been noted previously. The birds examined tested positive for type C botulinum toxin.

Ring-billed Gull Mortality at Roesler Lake, North Dakota. In mid July, U.S. Fish and Wildlife Service (USFWS), Kulm Wetland Management District Office biologists reported numerous sick and dead juvenile ring-billed gulls on Roesler Lake in south central North Dakota. This site had experienced similar die-offs of gulls in the previous 2 years that were thought to be due to salmonellosis or chlamydiosis, however no definitive diagnosis had been established in those cases. Gull carcasses were submitted to NWHC for diagnostic evaluation. *Salmonella* was cultured from 1 gull, which was also positive for *Chlamydia* on the polymerase chain reaction test. Acute pulmonary aspergillosis was diagnosed in 3 other gulls. NWHC Wildlife Disease Specialists conducted a field investigation to learn more about the epidemiology of the event and collect additional diagnostic specimens. Human health risks posed by the gull epizootic were discussed with local medical personnel, USFWS, U.S. Dept. of Agriculture APHIS Veterinary Services, and ND Dept. of Public Health. A joint news release was issued informing the public of preventive actions to take to avoid exposure to potential zoonotic disease agents in and around Roesler Lake. The diagnostic investigation of this event is continuing at NWHC and other veterinary diagnostic facilities.

American White Pelican Mortality at Lacreek National Wildlife Refuge, South Dakota. Wildlife managers from Lacreek NWR near Martin, South Dakota reported acute mortality in American white pelican chicks on 2 nesting islands in a Refuge impoundment in late July. Specimens submitted to NWHC had gross lesions suggestive of chlamydiosis. The Refuge staff was immediately notified to limit access to the islands and collect and dispose of all carcasses using appropriate procedures for protection of human health. In early August, NWHC Wildlife Disease Specialists visited the Refuge to conduct an epidemiologic investigation, collect additional specimens for diagnostic evaluation, and consult with Refuge staff on potential disease response procedures to reduce the potential of exposure of the public to zoonotic disease agents. At that time the mortality in young of the year American white pelicans had reached almost 100 percent. The diagnostic investigations are ongoing.

Doves in Florida. The University of Florida reported Eurasian collared dove mortality in the western panhandle of coastal Florida that began in late August may be due to Newcastle Disease Virus. Further laboratory evaluation and pathogenicity testing are underway at the National Veterinary Services Laboratory in Ames, Iowa. Several thousand birds are estimated to have died during this outbreak.

Doves in New York. In late May, New York City residents reported sick rock doves (pigeons) in the vicinity of Central Park. Clinical signs included convulsions, circling and disorientation. It was suspected that bird seed had been poisoned. At least 21 doves succumbed during this event. Birds were submitted to

New York State Department of Environmental Conservation Wildlife Pathology Unit for diagnostic evaluation. The most notable gross findings were necrotic lesions in the livers and pale kidneys. Histopathological examination of the liver and kidney showed areas of necrosis associated with crystals. The final diagnosis was poisoning due to ethylene glycol (antifreeze).

Amphibians. Amphibian morbidity and mortality continued throughout this quarter in a variety of life stages, species, locations and types of habitat. Of particular note are two events in wood frogs: a first report of a viral infection in larval wood frogs in an isolated area of Alaska, and a die-off of an estimated 10,000 wood frog larvae at a pond in Rhode Island where there was no previous history of amphibian mortality. Chytrid fungus infections were confirmed for the first time in boreal toads in Utah, for the second year in Pacific tree frogs in San Francisquito Canyon, California, and in a declining population of mountain yellow-legged frogs in the Sierra National Forest in California. This diagnosis in mountain yellow-legged frogs could signal a further population decline in excess of 90% or extirpation of the population in this area. In addition, an estimated 500 mountain yellow-legged frogs died of a presumptive ranavirus infection in Kings Canyon National Park in California; possibly the first large mortality event due to a virus in any species of amphibians in California.

Update—Bald Eagle Mortality in Wisconsin. From late December 2000 to March 2001, the Wisconsin Dept. of Natural Resources reported 13 bald eagles were found sick and dead in the Wisconsin River area in south central Wisconsin. Clinical signs included an inability to fly, incoordination, vomiting, mild to moderate seizing and easily approached and captured. A variety of diagnoses were found in the birds. There was some evidence on histopathology that at least 2 of the eagles had microscopic changes similar to those seen in a 1994–1995 eagle morbidity and mortality event in the same area in which 16 sick and dead bald eagles were recovered. The cause of the die-off was undetermined. Avian vacuolar myelinopathy was ruled out as a cause of mortality in the 1994–95 and 2000–01 Wisconsin eagle mortality events.

West Nile Virus Summary for 2001. The following information on West Nile virus (WNV) is a compilation of direct and website communications with several State Departments of Health, ProMED list serve (<http://www.promedmail.org>), USDA Animal Plant Health Inspection Service (APHIS) (<http://www.aphis.usda.gov/oa/wnv/index.html>) updates on equine cases, and Centers for Disease Control (CDC) Morbidity and Mortality Weekly Report (MMWR) (<http://www.cdc.gov/mmwr/mmwr-wk.html>) of surveillance data reported by states.

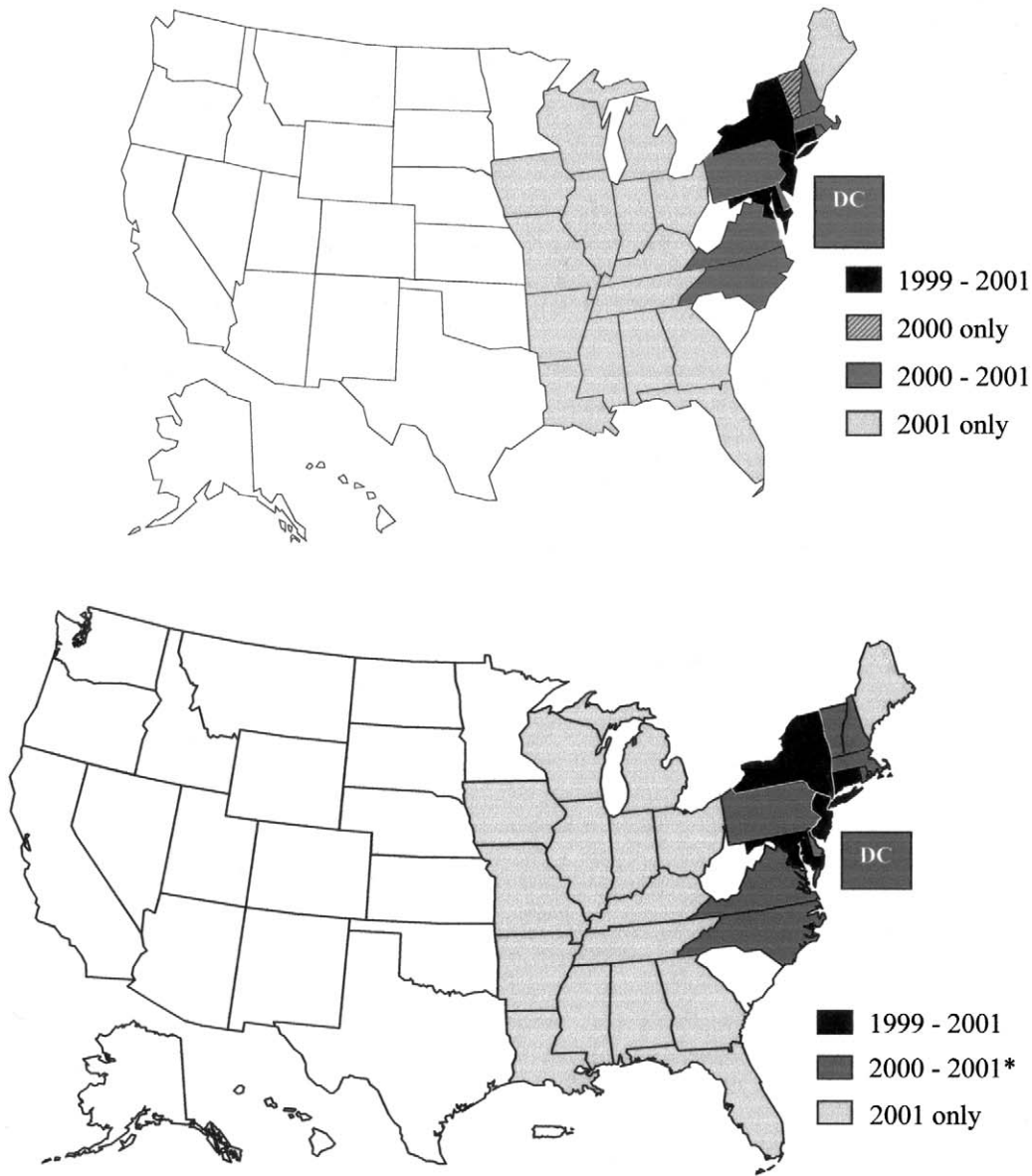
West Nile virus infections rapidly increased in intensity and distribution in the United States throughout 2001. The anticipated shift in the focus of WNV infection from the 12 northeastern states and DC positive in 2000, to additional states occurred in both a southward and westward direction. The presence of WNV in an additional 16 states in 2001 (not in Vermont in 2001) probably reflects infections distributed during the 2000 fall migration of infected birds to southern states (Map 1). The 2001 spring northern migration of similarly infected birds could have led to infections in more western and northern states. West Nile virus was confirmed for the first time this year in Ontario, Canada. This year the USGS Center for Integration of Natural Disaster Information (CINDI) is working with CDC to map the geographic and temporal spread of WNV across United States. These maps are updated weekly and accessible at http://cindi.usgs.gov/hazard/event/west_nile/west_nile.html.

Wild bird mortality continues to be the most sensitive method for detecting WNV activity, so state and local health departments depend on the testing of dead birds to determine the distribution of WNV. Avian mortality has continued unabated since the initiation of spring transmission on April 30, 2001, with expansion of WNV in birds to 27 states and the District of Columbia (Table 1). The American crow is the most susceptible species with over 4,500 confirmed positive in 2001. Other avian species, in particular birds in the Corvidae family (crows, ravens, jays and magpies), are also susceptible and WNV was confirmed in about 1,500 non-crow species this year. WNV was confirmed in 4323 birds in 2000, and 194 birds in 1999. There is continued concern that WNV poses a risk to threatened or endangered species such as the whooping crane, scrub jay and wood stork. Since 1999, the virus has been detected in over 80 species of birds, including 62 free-ranging species from 28 states, the District of Columbia and Ontario, Canada. In addition WNV was confirmed in 6 wild mammals in 2000.

A cumulative list of avian and mammalian species confirmed positive for WNV is available at http://www.nwhc.usgs.gov/research/west_nile/wnvaffected.html.

In addition to avian mortality, the USDA APHIS reports in 2001 there have been 347 cases (344 confirmed, 3 probable) of WNV infection in horses from 18 States (Table 1). Approximately 22.5% of equine infections reported to USDA to date were fatal or the horse was euthanized. Equine deaths from WNV infections by state are: Florida (31), New Jersey (5), Pennsylvania (4), Connecticut (3), Louisiana (3), Mississippi (3), Georgia (2), New York (2), Delaware (1), Illinois (1), Massachusetts (1), North Carolina (1), Tennessee (1) and Virginia (1). States with equine cases but no deaths are: Alabama, Kentucky, Maryland and Rhode Island. In 2000 there were 60 equine cases of WNV with 23 deaths and in 1999 there were 25 cases with five deaths.

Map 1. WNV Positive States



* VT was positive in 2000 only

The CDC reported 49 human cases of WNV have occurred in New York (12), Florida (10), Connecticut (6), Maryland (6), New Jersey (7), Pennsylvania (3), Massachusetts (2), Georgia (1), Louisiana (1), and Alabama (1) (Table 1). There have been five human mortalities confirmed by CDC in Alabama, Connecticut, Georgia, Massachusetts and New Jersey (1 per state). In 2000 there were 21 human cases of WNV with two deaths and in 1999 there were 62 human cases with seven deaths.

The USGS National Wildlife Health Center (NWHC) continues to provide diagnostic support to local, state and Federal agencies such as public health and wildlife organizations by receiving carcasses, tissues or serum to attempt detection of WNV. Active surveillance to detect the geographic expansion of the virus by sampling free-ranging wild birds was ongoing in collaboration with USDA, US Fish and Wildlife Service (USFWS) and several state wildlife agencies in the eastern United States. In 2001, the USGS NWHC began a research effort in collaboration with CDC to investigate the role of migratory birds in disseminating the virus and to investigate pathways for WNV maintenance and transmission. Migratory birds are being sampled for presence of WNV at National Wildlife Refuges, National Parks, and Military facilities from

TABLE 1. WNV Positive Humans and Animals Within States, 2001.

| State | Birds | Humans | Horses | Mosquitoes |
|-------|-------|--------|--------|------------|
| CT | + | + | + | + |
| FL | + | + | + | + |
| GA | + | + | + | + |
| MA | + | + | + | + |
| NY | + | + | + | + |
| PA | + | + | + | + |
| AL | + | + | + | |
| LA | + | + | + | |
| MD | + | + | | + |
| NJ | + | + | | + |
| KY | + | | + | + |
| VA | + | | + | + |
| IN | + | | + | |
| MS | + | | + | |
| NC | + | | + | |
| TN | + | | + | |
| IL | + | | | + |
| MI | + | | | + |
| NH | + | | | + |
| OH | + | | | + |
| RI | + | | | + |
| AR | + | | | |
| DC | + | | | |
| DE | + | | | |
| IA | + | | | |
| ME | + | | | |
| MO | + | | | |
| WI | + | | | |

Massachusetts to Florida during spring and fall migrations for 3 years. Experimental research conducted by NWHC has demonstrated direct transmission of WNV between infected and uninfected crows under confined laboratory conditions and oral transmission by feeding infant mice infected with WNV to crows. The efficacy of a commercial killed-virus WNV vaccine is currently being evaluated in crows.

QUARTERLY WILDLIFE MORTALITY REPORT

July 2001 to September 2001

| State | Location | Dates | Species | Mortality | Diagnosis | Reported by |
|-------|-------------------------------|-------------------|---|-----------|------------------------------------|-------------|
| AK | Koyukuk NWR | 07/10/01–07/12/01 | Wood Frog | 35 (e) | Viral Infection: Iridovirus | NW |
| AR | Garland Co., Lake Hamilton | 06/30/01–07/20/01 | Domestic Mallard Duck Muscovy Duck | 80 (e) | Duck Plague | NW |
| CA | Death Valley NP | 07/24/01–08/08/01 | Western Pipistrel Bat | 38 (e) | Rabies | WN, WI |
| CA | Endert's Beach, Redwood NP | 06/05/01–07/20/01 | Northern Red-legged Frog | 350 (e) | Open | NW |
| CA | Fresno Co., King Canyon NP | 08/22/01–09/10/01 | Mtn. Yellow-Legged Frog | 500 (e) | Viral Infection: Ranavirus suspect | NW |
| CA | Fresno Co., Sierra NF | 07/16/01–07/17/01 | Mtn. Yellow-Legged Frog | 6 (e) | Fungal Infect.: Chytrid | NW |
| CA | Los Angeles Co., Plunge Creek | 08/24/01–08/28/01 | Pacific Tree Frog California Tree Frog | 20 (e) | Open | NW |
| CA, | Lower Klamath NWR | 08/07/01–10/04/01 | Mallard Duck | 649 | Botulism | NW |
| OR | Upper Klamath NWR | | Green-winged Teal Northern Pintail Duck Gadwall Duck Northern Shoveler Duck | | Type C | NW |

QUARTERLY WILDLIFE MORTALITY REPORT
 July 2001 to September 2001
 Continued

| State | Location | Dates | Species | Mortality | Diagnosis | Reported by |
|-------|---|----------------------|---|-----------|--|-------------|
| CA | Sacramento Complex | NWR 08/15/01–ongoing | Mallard Duck White-faced Ibis American Coot Northern Pintail Duck Green-winged Teal | 541 | Botulism suspect | NW |
| CA | San Diego Co., Rancho Jamul Restoration Site | 09/01/01–09/15/01 | African Clawed Frog | 1,000 (e) | Open | NW |
| DE | New Castle Co., Newark | 07/20/01–07/20/01 | Canada Goose Mallard Duck | 11 | Emaciation, Undetermined | DE |
| DE | Sussex & Newcastle Co. | 07/23/01–08/06/01 | Laughing Gull | 40 (e) | Trauma: Weather Suspect | NW |
| FL | Santa Rosa, Okaloosa & Bay Co. | 08/25/01–ongoing | Eurasian Collared Dove | 5,000 (e) | Newcastle Disease Virus suspect | FL |
| ID | Jefferson Co., Market Lake WMA | 07/16/01–08/01/01 | Franklin's Gull Mallard Duck Canada Goose California Gull White-faced Ibis | 162 | Emaciation | NW |
| IL | Chautauqua NWR | 09/20/01–10/15/01 | Northern Shoveler Duck Mallard Duck Northern Pintail Duck Herring Gull Caspian Tern | 115 (e) | Botulism Type C, Emaciation | NW |
| IL | DuPage Co., Palatine | 06/25/01–07/05/01 | Domestic Mallard Duck | 10 (e) | Botulism suspect | IL |
| KY | Fayette Co., Lexington, Jacobson Park | 07/22/01–08/10/01 | Mallard Duck Domestic Duck | 70 (e) | Botulism Type C | NW |
| LA | Terrebonne Co., Houma, Bank of Bayou Terrabonne | 07/01/01–07/01/01 | Domestic Mallard Duck | 4 | Toxicosis: OP compound | NW |
| MD | Poplar Island, Chesapeake Bay | 09/18/01–10/10/01 | Black-backed Gull Laughing Gull Mallard Duck American Black Duck Green-winged Teal American Black Duck | 75 | Botulism Type C, Aspergillosis, Trauma | NW |
| ME | Aroostook Co., Mars Hill Township | 06/25/01–08/01/01 | American Black Duck | 65 (e) | Parasitism suspect, Open | NW |
| MN | Dakota Co., Apple Valley | 07/03/01–09/10/01 | Mallard Duck | 100 (e) | Botulism Type C | NW |
| MT | Gallatin Co., Beaver Creek | 07/10/01–07/11/01 | Columbia Spotted Frog | 27 | Undetermined, Parasitism: Metacercaria | NW |
| ND | Kidder Co., Horsehead Lake | 08/06/01–09/06/01 | Ring-billed Gull Eared Grebe Blue-winged Teal Franklin's Gull Mallard Duck | 634 | Botulism Type C | NW |
| ND | Logan Co., Roesler Lake WPA | 07/16/01–08/10/01 | Ring-billed Gull California Gull | 1,250 | Open | NW |
| ND | McIntosh Co., Bovey WPA | 08/14/01–09/10/01 | Mallard Duck Green-winged Teal Northern Shoveler Duck | 120 (e) | Botulism Type C | NW |
| ND | McLean Co., Lake Audubon | 08/14/01–08/31/01 | American White Pelican Unidentified Gull Ring-necked Pheasant Unidentified Duck Unidentified Shorebird | 136 | Botulism Type C | NW |

QUARTERLY WILDLIFE MORTALITY REPORT

July 2001 to September 2001

Continued

| State | Location | Dates | Species | Mortality | Diagnosis | Reported by |
|--------|--|-------------------|---|-------------|---------------------------------|-------------|
| ND | Mountrail Co., Fox Island, Lake Sakakawea | 07/27/01–08/21/01 | Unidentified Gull Piping Plover Herring Gull Interior Least Tern | 45 | Botulism Type C, Open | NW |
| NE | Scotts Bluff Co., near Gering | 06/25/01–08/10/01 | Red Crossbill American Goldfinch | 150 (e) | Salmonellosis | NW |
| NY | Monroe Co., Rochester | 09/10/01–09/14/01 | Brown-headed Cowbird Common Grackle | 16 | Toxicosis: Diazinon | NY |
| NY | New York City | 05/21/01–05/23/01 | Rock Dove | 21 | Toxicosis: Ethylene glycol | NY |
| OH, KY | Hamilton Co., Boone, Kenton, & Campbell Co., | 06/01/01–09/15/01 | House Sparrow Mourning Dove | 11 | Emaciation, Aspergillosis | NW |
| OR | Clatsop Co., Columbia River Estuary | 08/24/01–09/30/01 | Double-crested Cormorant Common Murre Pelagic Cormorant Western Gull | 9, 88* | Open | NW |
| PR | Caño Tiburones, Arecibo | 07/03/01–07/20/01 | Little Blue Heron Tricolored Heron Snowy Egret Great Egret Brown Pelican | 300 (e) | Botulism Type C | NW |
| RI | Washington Co., Exeter | 07/08/01–07/15/01 | Wood Frog | 10,000s (e) | Undetermined | NW |
| SC | Berkeley Co. | 06/11/01–09/11/01 | Muscovy Duck | 6 | Toxicosis: Diazinon | NW, SC |
| SC | Edgefield Co., Edgefield | 08/14/01–08/28/01 | Mourning Dove | 5 | Parasitism: Trichomoniasis | SC |
| SC | Greenville Co., Greenville | 08/07/01–08/07/01 | Mallard Duck Canada Goose Domestic Duck | 10 (e) | Toxicosis: Diazinon | SC |
| SD | Lacreek NWR | 07/26/01–08/15/01 | American White Pelican | 158 | Open | NW |
| UT | Garfield Co., East Fork of Sevier River | 08/01/01–08/01/01 | Boreal Toad | 2 | Fungal Infect.: Chytrid | NW |
| UT | Iron Co., Kolob Canyon | 07/20/01–07/26/01 | White-throated Swift | 4 | Emaciation | NW |
| UT | Salt Lake City, Highland Park Ponds | 07/11/01–10/01/01 | Mallard Duck | 50 (e) | Botulism Type C | NW |
| UT | Utah Co., near Elberta | 07/01/01–07/10/01 | California Gull | 500 (e) | Open | NW |
| VA | Suffolk Co., Suffolk | 06/27/01–08/17/01 | Canada Goose Unidentified Teal American Black Duck Wood Duck Mallard Duck | 1,350 (e) | Botulism Type C | NW |
| WI | Dane Co., Madison, Brittingham Park | 08/01/01–08/02/01 | House Sparrow | 286 (e) | Electrocution: Lightning strike | WI |
| WI | Horicon NWR | 07/04/01–07/06/01 | American White Pelican | 3 | Botulism Type C | NW |
| WI | Manitowoc Co., Manitowoc & Cleveland | 07/21/01–09/10/01 | Ring-billed Gull | 100 (e) | Salmonellosis | NW, WI |
| WI | Upper Mississippi NWR | 08/05/01–08/17/01 | Mallard Duck Herring Gull | 40 (e) | Botulism Type C | NW, WI |
| WI | Vilas Co., North Twin Lake | 07/20/01–07/24/01 | Mallard Duck | 24 | Toxicosis: Diazinon | WI |

QUARTERLY WILDLIFE MORTALITY REPORT
 July 2001 to September 2001
 Continued

| State | Location | Dates | Species | Mortality | Diagnosis | Reported by |
|-----------------------------|--|-------------------|---|-----------|---|--|
| Updates/Corrections: | | | | | | |
| CA | Los Angeles Co., San Francisquito Canyon | 12/05/00–ongoing | Pacific Tree Frog | 8* | Fungal Infect.: Chytrid | NW |
| CA | San Diego Co., Camp Pendleton; Los Angeles Co., Venice Beach | 06/08/01–08/10/01 | California Least Tern | 295 | Emaciation | NW |
| CA | Sonny Bono Salton Sea NWR | 05/18/01–ongoing | Brown Pelican American White Pelican Ring-billed Gull Great Blue Heron Western Grebe | 151, 321* | Botulism Type C | NW |
| FL | Okeechobee Co., Lake Okeechobee | 12/01/00–05/21/01 | American White Pelican | 24 (e) | Aspergillosis, Trauma | NW, SC |
| FL | Pinellas & Hillsborough Co. | 05/25/01–07/20/01 | Eurasian Collared Dove Ringed Turtle Dove | 3,000 (e) | Parasitism: Trichomoniasis | FL |
| FL | Volusia Co., India River Lagoon | 05/01/01–09/20/01 | Bottle-nosed Dolphin | 32 | Open | NW |
| GA | Newton Co. | 05/01/01–08/20/01 | Mourning Dove | 18 (e) | Parasitism: Trichomoniasis | SC |
| ME | Hancock Co., Acadia NP | 06/10/01–07/01/01 | Green Frog Bull Frog Spring Peeper Frog | 600 (e) | Viral Infection suspect: Iridovirus | NW |
| MI | Wayne Co., Detroit | 06/01/01–07/01/01 | Herring Gull | 3,000 (e) | Dehydration | MI |
| MS | Harrison Co., near Gulfport | 03/03/01–03/08/01 | Southern Leopard Frog | 10 (e) | Fungal Infect.: Systemic Yeast-like | NW |
| PA | Allegheny Co. | 06/29/01–06/29/01 | Muscovy Duck | 28 | Viral Infection: Reovirus | NW |
| PA | Throughout Lake Erie | 06/23/01–ongoing | Ring-billed Gull Great Black-backed Gull Herring Gull Double-crested Cormorant Sanderling Fish (1000s) | 1,000 (e) | Botulism Type E & C | CC, NY, EH, CAN, NY, NW |
| PA | Erie Co., Presque Isle Bay, Lake Erie | 04/01/01–ongoing | Spiny Softshell Turtle Map Turtle Mudpuppy Salamander | 100s (e) | Pneumonia, Aeromonas, Undetermined | NW |
| WI | Sauk, Columbia, Adams & Dane Co., WI River | 12/20/00–03/30/01 | Bald Eagle | 13 | Undetermined, Trauma, Bacterial Infect. | NW, WI |

(e) = estimate; * = Morbidity, not mortality.

Canadian Cooperative Wildlife Health Centre at University of Guelph (CC), DE State Diagnostic Lab (DE), Erie County Health Dept. (EH), University of Florida Laboratory of Wildlife Disease Research (FL), IL Dept. of Natural Resources (IL), MI Dept. of Natural Resources (MI), USGS National Wildlife Health Center (NW), New York State Dept. of Environmental Conservation (NY), Southeastern Cooperative Wildlife Disease Study (SC) and WI Dept. of Natural Resources (WI).

Written and compiled by Kathryn Converse, Kimberli Miller, Grace McLaughlin, Rex Sohn and Audra Schrader, NWHC. The Quarterly Wildlife Mortality Report is also available on the Internet at <http://www.nwhc.usgs.gov>. To report mortality, or if you would like specific information on these mortalities, contact one of the following NWHC staff: Eastern US—Kimberli Miller; Western US—Kathryn Converse; Hawaiian Islands—Thierry Work; West Nile Virus—Kathryn Converse. Phone (608)270-2400, FAX (608)270-2415 or E-mail kathy.converse@usgs.gov.

National Wildlife Health Center, 6006 Schroder Road, Madison, WI 53711.

WDA Section News

NEWS FROM EUROPE

EWDA Website. The first few pages of the long-awaited EWDA website are now available on line. You can access the site by typing, <http://www.ewda.org>

Try it and see what you think. The site is still under construction so any contributions and/or suggestions for future content would be much appreciated. Send these via my email address on the site. *Richard Delahay, Central Science Laboratory, Wildlife Disease Ecology Team, Woodchester Park, Nympsfield, Glos GL10 3UJ, UK.*

Foot and Mouth Disease in the UK and Wildlife. The question has been raised as to whether or not there was enough data to allow the inclusion of susceptible wild animal movements, namely deer, in to any of the epidemiology models. Professor Alex Donaldson, head of the Institute for Animal Health Pirbright Laboratory said there was no indication that deer had played any part in the epidemic. Of approximately 100 deer samples that Pirbright received, none had proved positive for FMD virus. He was not greatly surprised by this as he suspected that wild deer would not be at great risk of the infection. Farmed deer had been culled where this had been thought necessary.

- *J P Duff. From the Veterinary Record (2001), 149 (18); page 541*

New Conditions. If you are investigating a disease that may be previously unreported, why not provide a short preliminary description and leave your contact details. Two such reports are given in avian species, one from Southern, and one from Northern Europe:

Dramatic Infertility and Embryo Mortality in a Lesser Kestrel (*Falco naumanni*) Captive Breeding Program in Spain. The lesser kestrel (*Falco naumanni*) is a migratory bird of prey that nests colonially in (old) buildings in Southern Europe. In recent decades the species has declined, probably due to changes in agriculture, but building restoration and competition with other birds for nest sites are also factors. Several captive breeding programs as part of a Spanish national conservation program are in progress. GREFA is a non-government organization founded in 1980 for the study of ecology and conservation with a staff of biologists, veterinarians and volunteers. Work is focused on the wildlife hospital; however, other significant activities include captive breeding projects, collaborative research, international field work and conservation work on specified areas and species, such as the lesser kestrel.

During the year 2000, a dramatic drop in chick production was observed in the lesser kestrel captive-breeding program at the GREFA Wildlife Hospital, Madrid, Spain. Necropsies of dead eggs showed that embryos died at different stages of development. Of the 276 eggs from the first clutch that were incubated artificially, 57% were dead-in-shell and 42% were infertile. As an iatrogenic problem was suspected, we decided to breed the second clutch by natural incubation. 100% of 124 eggs were infertile or dead-in-shell.

Bacteriological cultures were undertaken on eggs and embryos in 1997–99 for salmonellae with negative results; however, *Salmonella enteritidis* was isolated from the intestine of an adult bird from the colony on one occasion. *E.coli*, *Streptococcus sp.* and *Staphylococcus sp.* were isolated in 11 eggs from 127 necropsied eggs (16%). A Bio-Merieux VIDAS Chlamydia test for *Chlamydia trachomatis* antigen (but capable of detecting genus specific antigen) gave 20% positive results from 127 dead-in shell eggs.

As chlamydia was then suspected, over the winter months of 2000–2001, all adults birds were treated for 45 days with a combination of doxycycline (50 mg/kg/day) and enrofloxacin (15mg/kg/day) in-feed medication.

The 2001 breeding season produced 318 eggs and 115 chicks from 43 breeding kestrel pairs. 153 egg necropsies with bacterial cultures and Bio-Merieux VIDAS chlamydia tests; all produced similar results to the previous year. Some embryos and dead chicks were tested by PCR for *Chlamydia psittaci*, and all gave negative results. Material from embryos and chicks was inoculated into eggs and cell cultures for attempted virus isolation. Only an adenovirus, of doubtful significance, was isolated, from chick tissues.

It appears that this year (2001) we have recovered the normal production rates for captive lesser kestrel but we do not know yet the reason for the dramatic infertility and embryo mortality.

| Year | No. Breeding Pairs | No. Total Eggs | No. Infertile Eggs | No. Dead in Shell Embryos | No. Chicks Hatched Alive |
|------|--------------------|----------------|--------------------|---------------------------|--------------------------|
| 1998 | 39 | 273 | 83 | 78 | 112 |
| 1999 | 46 | 364 | 95 | 130 | 139 |
| 2000 | 53 | 400 | 162 | 218 | 20 |
| 2001 | 43 | 318 | 58 | 145 | 115 |

| Year | Fertility | Clutch Index | % Eggs Hatched |
|------|-----------|--------------|----------------|
| 1998 | 69.9% | 7 | 58, 9% |
| 1999 | 73, 9% | 7, 9 | 51, 67% |
| 2000 | 59, 5% | 7, 5 | 8, 4% |
| 2001 | 81, 7% | 7, 4 | 44, 2% |

We would be grateful if workers in similar fields could offer comment and suggestions? We acknowledge the help of Mar Gallego, Spain and Paul Duff, UK.

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Circovirus in Wild Birds in the Netherlands. Increased mortality in multiple wild bird species, including gulls, crows, and pigeons, was reported by rehabilitation centers in the Netherlands since the end of May. Clinical signs included ataxia, diarrhea and apathy. 54 birds of 21 species were submitted to the Department of Virology, Erasmus University, Rotterdam, for pathologic and virologic examination.

The results of virus isolation and RT-PCR procedures for flaviviruses (including West Nile Virus), avian paramyxoviruses (including Newcastle disease virus), influenza virus, and infectious bursal disease virus were negative.

Histopathology revealed that the most frequently seen lesion in multiple species was lymphocytic necrosis in lymphoid organs. The presence of a circovirus-like agent was identified by electron microscopic examination of characteristic basophilic intracytoplasmic inclusions in the Bursa of Fabricius in two species: Black headed gull (*Larus ridibundus*) and domestic pigeon (*Columbia livia*). Similar inclusions were found in two other species: wood pigeons (*Columba palumbus*) and oystercatcher (*Haematopus ostralegus*).

Circovirus infections in birds are associated with immunodeficiency-related diseases. They are known to cause disease in chickens (chicken anemia virus), psittacines (psittacine beak and feather disease), and pigeons (pigeon circovirus). In Europe, circovirus infection has been recorded in domestic pigeons, but not other free-living birds.

Further studies are underway to determine the possible relationship of the circovirus-like agents found, the extent and distribution of the infection in wild bird species, and their significance for the observed mortality. Samples from Swedish birds will also be examined in collaboration with the National Veterinary Institute in Uppsala, Sweden.

- Thijs Kuiken DVM PhD, Ron Fouchier PhD, Ab Osterhaus DVM PhD, Department of Virology, Erasmus University, Rotterdam. E-mail kuiken@viro.azr.nl

Research Project on Wild Boar Diseases. The wild boar (*Sus scrofa*) is the most common wild ungulate in the Iberian Peninsula. In the last decades, its population has increased dramatically in Europe. Suids are considered a reservoir host for many diseases that affect domestic pigs (e.g. classical swine fever) and also of zoonoses such as tuberculosis. Some viral or bacterial agents may also be relevant for the dynamics of these boar populations (e. g. Aujeszky's disease virus). Therefore, the wild boar is a good model to study the role of diseases in vertebrate population dynamics, and in particular to study the impact of varying management systems on its health status.

In spite of its ecological, sanitary and socio-economical importance, little information on the role of disease in wild boar populations is available. Recently, the funding for the research project "Scientific basis for the prevention of health risks in game production: the wild boar" has been approved by the Spanish Science and Technology Ministry. It will be carried out by the IREC (the national institute for game biology) from 2002 to 2005. We hope to identify risk factors associated in wild boar production. Our main goals are (1) to describe the epidemiology of the most prominent diseases of Spanish wild boar populations, with special emphasis on diseases such as tuberculosis, that are relevant for public health, domestic livestock breeding, game production and conservation, and (2) to study the role of disease in wild boar population dynamics.

Any input and collaboration with research groups from other countries will be most welcome. Contact address: Christian Gortázar, IREC, P.O. Box 535, E-13080 Ciudad Real, Spain. gortazar@irec.uclm.es

EUROPEAN SECTION. Material suitable for publication includes news of recent wildlife disease outbreaks in Europe, short case reports, job and scholarship announcements, announcements and reports on relevant meetings in Europe. Submissions should be in English, but members for whom English is a second language and who send material in basic English or in their own language will be accommodated as far as possible. The deadline for submission of articles for the next issue is February 2002. *Please*

mail, fax or e-mail submissions to Paul Duff, VLA Penrith, Merrythought, Calthwaite, PENRITH, Cumbria, CA11 9RR, United Kingdom, e-mail (p.duff@vla.defra.gsi.gov.uk).

WDA SECTION CHAIRS AND CONTACT INFORMATION

AUSTRALASIAN SECTION. For information regarding the Australasian Section, contact Peter Holz, Healesville Sanctuary, P.O. Box 248, Healesville, Victoria 3777 Australia. Telephone: 61 3 5957 2864; fax: 61 3 5957 2870; email: pholz@zoo.org.au

EUROPEAN SECTION. For information regarding the European Section, contact Torsten Morner, The National Veterinary Institute, Department of Wildlife, Box 7073, S750 07, Uppsala, Sweden. Telephone: +46-1867-4214; fax: +46-1830-9162; email: Torsten.Morner@SVA.SE

LATIN AMERICAN SECTION. For information regarding the Latin American Section, contact Alonso Aguirre, TUSVM Wildlife Clinic, 200 Westboro Road, North Grafton, MA 01536, USA. Telephone: (508) 839-7918; fax: (508) 839-7930; email: aguirre@wpti.org

NORDIC SECTION. For information regarding the Nordic Section, contact Hans-Henrik Dietz, Danish Veterinary Laboratory, Department of Fur Animal and Wildlife Diseases, 2 Hangovej, DK-8200 Aarhus N, Denmark. Telephone: 45-89-37-24-17; fax: 45-89-37-24-70; email: hhd@svs.dk

WILDLIFE VETERINARIAN SECTION. For information regarding the Wildlife Veterinarian Section, contact Dr. Terry Kreeger, Wyoming Game and Fish Department, 2362 Highway 34, Wheatland, Wyoming 82201 USA. Telephone: 307-322-2571; FAX 307-766-5630; email: tekreege@wyoming.com

JOB ANNOUNCEMENT

Field And Lab Research Interns (17 Positions) Needed beginning mid January 2002 to conduct field and laboratory work on avian disease in Hawaii. The Biocomplexity of Avian Disease project is a 5-year NSF-funded research program. Research interns will conduct field work at 9 sites from sea level to 6,000 ft elevation on the eastern slope of Mauna Loa Volcano, Hawaii. Field sites range from extremely hot and dry to extremely wet, muddy, and rainy. Field work will consist of: (1) mistnetting and banding forest birds; (2) trapping mosquitoes; (3) collecting data on plant phenology, vegetation structure, small mammal abundance, feral pig disturbance, and larval mosquito habitat. Work schedule and duties will vary during the course of the internship. Laboratory work will consist of: (1) caring for and collecting blood samples from experimental birds in aviaries; (2) microscope work to assist with the diagnosis and quantification of malarial infections in wild and experimental birds; (3) bench work assisting with serological diagnosis of chronic malarial infections in wild birds. Applicants must be in excellent physical condition, able to walk long distances over rugged, uneven terrain, work in remote locations (camping 4-8 days at a time may be required), live and work in close proximity with other volunteers, have full color vision and hearing, and be able to work for long periods at a compound microscope. **DESIRABLE QUALIFICATIONS:** undergraduate coursework in ecology, ornithology, wildlife biology, microbiology and/or parasitology and prior experience mistnetting, handling, and identifying forest birds. Food and laundry stipend of \$400 per month, dormitory-style housing, field equipment, and field and laboratory training are provided; interns must provide their own airfare to Hilo, Hawaii. Days are long and field work is demanding, but schedule provides ample time for relaxation and exploring Hawaii (snorkeling, swimming, surfing, diving, hiking, biking). Interns live in a small rural community next to Hawaii Volcanoes National Park, site of one of the world's most active volcanoes. Please send cover letter, resume, and names and *current* telephone numbers of 3 references to: CARTER ATKINSON, P.O. BOX 218, HAWAII NATIONAL PARK, HI 96718, EMAIL: Carter-Atkinson@usgs.gov, FAX: 808-967-8545.

TRAINING/EDUCATIONAL OPPORTUNITIES

Training Available in Fish Diagnostics, Inspections, and Laboratory Methods. The US Fish and Wildlife Service Fish Health Centers provide laboratory and field examination services to the National Fish Hatcheries. Our main emphasis is to assist the hatcheries in producing quality fish that will contribute to the enhancement and restoration of aquatic ecosystems.

At the Olympia and Idaho Fish Health Centers, the work may involve travel to field sites to perform diagnostic examinations and collect samples that are then evaluated in our laboratories. Routine testing procedures include bacteriology (biochemical, ELISA, and PCR methods), virology (cell culture, serological, and PCR methods), parasitology (microscopic and PCR methods), histology, and clinical chemistry.

Training may be arranged for one day or several weeks at one or both of these laboratories depending on the interests and availability of the individual. In general, most broodstock inspections are performed from September through November, juvenile inspections are performed from January through April, and wild fish surveys are conducted from March through September. Routine diagnostic examinations are performed year round and special projects are conducted as time and necessity permit.

For more information, please contact Joy Evered DVM, at the Olympia Fish Health Center; email joy_evered@fws.gov or Marilyn Blair DVM, at the Idaho Fish Health Center; email marilyn_j.blair@fws.gov.

Veterinary Internship in Wildlife and Conservation Medicine. A year-long internship in wildlife medicine is being offered to veterinarians by The Wildlife Center of Virginia. The Wildlife Center is a private, non-profit, organization with a professionally staffed, fully equipped 5,700 square foot hospital, research, rehabilitation, and education center located in Waynesboro, Virginia, in the heart of the beautiful Shenandoah Valley. The WCV is presented with over 3,000 patients annually representing over 200 different species. 65% percent of the patients are birds and approximately half of the birds are raptors. The intern will be supervised by an experienced wildlife veterinarian and assisted by a licensed veterinary technician, rehabilitation staff, and numerous volunteers. The intern will also advise wildlife rehabilitators and supervise senior veterinary students from various schools. The intern will be involved in all aspects of wildlife medicine and rehabilitation including physical examination, sample collection, radiography, anesthesia, surgery, medical treatment, physical therapy, necropsy, husbandry, record maintenance, telephone consultations, and presentations at rounds. Conference presentation and writing for publication are encouraged, and the intern will be expected to produce one scientific paper for publication during the year. Opportunities exist to be involved in ongoing conservation medicine projects as well as interaction with other local institutions (Virginia Tech, National Zoo and Virginia Marine Science Museum). Veterinary candidates must have a strong interest in wildlife medicine, especially avian medicine and must have well-developed interpersonal and clinical skills. Experience in wildlife medicine is desirable, but not required. Preference will be given to applicants with clinical experience. Interested candidates should send a letter of intent, curriculum vitae, veterinary school transcript and three letters of reference. A Virginia veterinary license will be required. The deadline for applications is March 1, 2002. The selection will be made by April 15 for a June 1 starting date. Correspondence should be addressed to Dr. Jonathan Sleeman, Director of Veterinary Services, The Wildlife Center of Virginia, P.O. Box 1557, Waynesboro, VA 22980.

Zoo Medicine Course, June 10–14, 2002. The University of Tennessee, College of Veterinary Medicine; Knoxville, Tennessee. A five-day course on zoological medicine will be held at the University of Tennessee's College of Veterinary Medicine from June 10–14, 2002. The program, consisting of lectures and laboratories, will be conducted in conjunction with the Knoxville Zoological Gardens. It is the fourth year of the program, which has attracted veterinarians and veterinary students from throughout the world.

The course will include a wide range of topics in captive wildlife medicine, focusing on those aspects of zoo animal medicine and husbandry not covered by other continuing education programs. Topics will include zoo animal nutrition, infectious diseases of reptiles and felids, raptor medicine, non-human primate preventive medicine, immobilization, darting systems and elephant and rhinoceros medicine.

The cost is \$1,000 (U. S.) for veterinarians and \$500 (U. S.) for veterinary students. Enrollment is limited to 15 people. For additional information, contact Dr. Ed Ramsay at 865/974-5576 (e-mail: eramsay@utk.edu). To register, contact Barbara Campbell at 865/974-7264 (e-mail: bcampbe4@utk.edu). Registration deadline is Mar. 15, 2002. Further details are available on the college's web site at http://www.vet.utk.edu/avi_zoo/zooschool.html.

Two Wildlife Field Courses, South Africa. Offered by University of Pretoria and EcoLife Expeditions, South Africa International Universities Program.

ECOSYSTEMS AND WILDLIFE MANAGEMENT (4 credits – 2 weeks)

PEOPLE AND NATURE CONSERVATION (4 credits – 2 weeks).

The University of Pretoria Wildlife Management offers two wildlife field courses for students and professionals in wildlife biology, wildlife management, conservation, or ecotourism. Both courses are taught in nature reserve areas, where students camp and participate in conservation projects. Course topics include wildlife management techniques, sustainable resource utilization, ecosystem and biodiversity conservation, reserve and resort management, African local community cultures and conservation perspectives, Africa tourism principles and historical sites.

The cost for one course is \$1250 (US dollars) per person, or \$2400 for both courses. The course fee does not include airfare. Courses are offered in December, April through September.

For more information contact Education@ecolife.co.za. Mailing address: Professor Wouter van Hoven,

Ecolife Expeditions, 976 Duncan Street, Brooklyn, Pretoria, 0181, South Africa. Telephone: +27 12 460 5430, Fax: +27 12 460 9707, Email: education@ecolife.co.za, URL: www.ecolife.co.za/mainframe.html

Post-Graduate Studies in Wild Animal Health and Management: A Second Year for the Course in Uganda—and a New Masters Course. A one-year post-graduate training course in Wild Animal Health and Management has been introduced in Uganda, East Africa. It is organized by the Faculty of Veterinary Medicine, Makerere University.

The course provides specialized instruction in such fields and animal ecology, wildlife disease, protected areas management and conservation legislation. Formal lectures are supplemented with fieldwork and students undertake their own research projects. Some modules take place in the field, in the stimulating and attractive atmosphere of Lake Mburo National Park, about four hours' drive from Kampala, where students and lecturers are able to work with indigenous wildlife and to interact with the Park's staff and local communities. The language of instruction is English, and lecturers are drawn from Europe as well as Uganda itself. A more extensive Masters (Msc) Course will start in 2001. At a time when health management and utilization of wildlife are attracting both interest and debate, these new courses provide much needed training opportunities for those planning to work in these fields, especially in Africa or other tropical regions.

Further information is available from Dr. Christine Dranzoa, WARM, Faculty of Veterinary Medicine, Makerere University, P.O. Box 7062, Kampala, Uganda. Email: warm@uga.healthnet.org. Additional information can be obtained from Professor John E. Cooper, Wildlife Health Services, P.O. Box 153, Wellesborough, NN8 2ZA, UK. Email: NGAGI@compuserve.com or the British Veterinary Association, 7 Mansfield Street, London W1G 9NQ, UK. Email: press@bva.co.uk

Preceptorships at Willowbrook Wildlife Center. Willowbrook is a wildlife rehabilitation and education center located in DuPage County, west of Chicago, IL. Preceptors receive training and significant hands-on experience in the diagnosis and treatment of wildlife species native to Illinois. Preceptors are expected to perform routine veterinary procedures under the supervision of Willowbrook's staff veterinarian. In the absence of the veterinarian, the preceptor will be expected to assist the wildlife keepers in their animal care duties. Qualifications include being a veterinary student or veterinarian, willingness to handle wild animals, ability to cooperate with staff, volunteers, and the public, and the ability to work independently.

Veterinary students receive a stipend (\$260 per week in 2000), paid every two weeks. The length of commitment is a minimum of 4 weeks (40 hrs/wk) to a maximum of 16 weeks. Housing arrangements and transportation are not provided and are the preceptor's responsibility. Tetanus toxoid and rabies pre-exposure vaccinations are also required. Veterinary students are asked to submit a Curriculum Vitae, official copy of their transcript, two written recommendations, and dates of availability.

This is an excellent opportunity for veterinary students to augment their training in non-domestic species. For further information, contact Dr. Catherine Brown at (630) 942-6204 ext.21 or email: kbrown@dupageforest.com

Training Position in Zoological Pathology. The Department of Pathobiological Sciences, School of Veterinary Medicine, University of Wisconsin—Madison, in association with Research Animal Resources Center, University of Wisconsin—Madison, and the Milwaukee County Zoo is seeking a trainee in Zoo Pathology. Qualified applicants must hold a DVM or equivalent degree from an accredited College of Veterinary Medicine and be eligible for licensure in Wisconsin. Since residency training at the University of Wisconsin-Madison School of Veterinary Medicine involves the practice of veterinary medicine on privately owned animals, resident trainees are required to be licensed in the state of Wisconsin at the time they begin their residency program. Prospective resident trainees who are graduates of schools that are not accredited by the AVMA must have passed either the NBE and CCT, or the NAVLE in order to obtain a license in Wisconsin. Graduates of schools that are not AVMA approved may register for the NAVLE examination through a limited number of states in the United States. (Some states require enrollment or completion of the ECFVG or similar program) You may want to visit the following web sites to learn more about licensing examinations and processes: <http://www.aavsb.org> and <http://www.nbec.org>.

Preference will be given to individuals with two or more years of residency training in anatomical pathology. The 2 year program, scheduled to begin July 2002 is designed to provide training and experience to prepare the trainee for a career in zoo, wildlife, avian, aquatic or exotic animal pathology and eligibility to sit the certification examination in anatomic pathology of the American College of Veterinary Pathologists. Stipend is \$25,000/yr.

Send curriculum vitae and the names of at least three references to: Dr. R.D. Schultz, Professor and Chair, Department of Pathobiological Sciences, School of Veterinary Medicine, University of Wisconsin—Madison. 2015 Linden Drive West, Madison, Wisconsin 53706-1102. Telephone: (608) 2623-9888.

The University of Wisconsin is an Equal Opportunity and Affirmative Action Employer. Minorities and

women are strongly urged to apply. Names, titles and/or occupation and addresses of applicants or nominees cannot be kept confidential.

Directory of Post-Graduate Educational Opportunities in Zoo and Wildlife Medicine. The World Association of Wildlife Veterinarians has recently produced a Directory of Post-Graduate Educational Opportunities in Zoo and Wildlife Medicine. The Directory covers opportunities in over fifty countries and is a must for veterinary students or graduates interested in furthering their careers in the field of wildlife medicine. For further information, please contact the Secretary of the WAWV at: F.Scullion@zoo.co.uk

MEETING ANNOUNCEMENTS

Symposium on the Medical Management and Captive Care of Chiroptera. May 15–18, 2002; Gainesville, Florida. This symposium is hosted by Lube Foundation, Inc., the American Zoo and Aquarium Association Bat Taxon Advisory Group, and University of Florida Veterinary Medical Teaching Hospital.

The program includes presentations on medical management, emerging diseases, field programs, conservation, education and captive husbandry and management of Chiroptera. A separate two day Zoo Educators Workshop, a one day Florida Teachers Workshop and a Rodrigues Fruit Bat Family Extravaganza will also be held in conjunction with this conference.

Preliminary Agenda:

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| Wednesday, May 15 | Zoo Educators Workshop Registration No Host Social |
| Thursday, May 16 | Zoo Educators Workshop Emerging Disease Symposium |
| Friday, May 17 | Ecology and Captive Management Symposium Banquet Dinner |
| Saturday, May 18 | Ecology and Captive Management Symposium Florida Teachers Workshop |

Special Activity

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| Sunday, May 19 | AZA Rodrigues Fruit Bat Species Survival Plan Family Extravaganza |
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Symposiums will be held at the Holiday Inn. Workshops, banquet dinner and Rodrigues Fruit Bat Family Extravaganza will be held at the Lube Foundation, Inc., 1309 NW 192nd Avenue, Gainesville, FL 32609

For further information on this conference or the workshops, please contact one of the following:
John Seyjagat, Lube Foundation at 352 485-1250 or LUBEEBAT@aol.com
Peter Riger, Nashville Zoo at 615 746-2526 or priger@email.msn.com
Denise Tomlinson, OBC Florida Bat Center at 941 637-6990 or DRTomlinsn@aol.com

Inaugural Conference of the Dutch Society for Wildlife Health—First Announcement and Call for Papers. June 8, 2002; Amsterdam, The Netherlands. The Inaugural Conference of the Dutch Society for Wildlife Health (DSWH) will be held on Saturday, June 8, 2002 in Amsterdam, The Netherlands at the ARTIS Conference Center adjacent to the Zoo.

The central theme of the conference is the complex relationship between environmental parameters and wildlife and human health in the Netherlands. However, contributions relating to other geographical areas or other topics related to wildlife disease that are applicable to the Netherlands are encouraged. Keynote speakers are Dr. Corrie Brown from the College of Veterinary Medicine, University of Georgia, Athens, USA (The global increase of infectious disease outbreaks in wildlife) and Dr. Jef Vos from the National Institute of Public Health and the Environment, Bilthoven, The Netherlands (The effect of endocrine disruptors on wildlife and human health). The scientific programme will be followed by a buffet dinner and the Annual General Meeting of the DSWH.

Abstracts should be submitted by April 15, 2002, to Dr Ab Osterhaus, Institute of Virology, P.O.Box 1738, 3000 DR Rotterdam, The Netherlands preferably as an attachment in Word by e-mail: osterhaus@viro.fgg.eur.nl (Fax +31[0]10 4089485; Phone +31[0]10 4088066). Abstracts should include title, name and affiliation of authors, an informative summary of up to 200 words, and preference for oral

presentation or poster. Please contact Dr. Osterhaus for special abstract forms. The three best student abstracts will be awarded a prize of 300, 200 and 100 Euro, and free registration to the conference. Please indicate whether you wish to be judged and provide evidence of your student status.

For registration please contact Dr. J.T. Lumeij, Division of Avian, Exotic Animal and Wildlife Medicine, Department of Clinical Sciences of Companion Animals, Utrecht University, Yalelaan 8, 3584 CM Utrecht, The Netherlands, preferably by e-mail: J.T.Lumeij@vet.uu.nl (Subject: Conference registration DSWH). Registration fees, including lunch and coffee breaks, are:

- Early registration (up to March 1, 2002)
 - Student members* 25 Euro
 - Regular members* 50 Euro
 - Non-members 85 Euro
- Late registration (after March 1, 2002)
 - Student members* 40 Euro
 - Regular members* 75 Euro
 - Non-members 110 Euro
- The buffet dinner will be charged separately at 25 Euro

* Membership of the DSWH is 50 Euro per year (25 Euro for students). To apply for membership please contact J.T.Lumeij@vet.uu.nl (Subject: Membership registration DSWH).

The above conference is a satellite meeting to the First International Meeting of Wildlife and Zoo Virology, which will be held consecutively, from June 9–11, 2002, at the same venue. For further information and registration on this virology conference, and hotel accommodation, please consult their website at www.wildlife2002.nl

First International Meeting of Wildlife and Zoo Virology. June 9–11, 2002; Amsterdam, The Netherlands.

The First International Meeting of Wildlife and Zoo Virology, entitled “Encroachment on Wildlife ecosystems: new and re-emerging viral epidemics” will be held from June 9–11 in Amsterdam, at the ARTIS Conference Centre adjacent to the zoo. This meeting is focused on the consequences of altering eco-systems—alterations that affect an established virus-host balance, with new and re-emerging diseases as a consequence. Agents often persist in their natural reservoirs until an ecological imbalance, i.e. the destruction of forests, allows them to cross into a susceptible species where they may cause epidemics of a pandemic potential. When new species are introduced into “foreign” environments or when a virus-host relationship is altered i.e. by vaccination, another disequilibrium may arise.

Several new and re-emerging viral epidemics, like West Nile fever, Rift valley fever, foot-and-mouth disease, were witnessed during the last decade and illustrate the importance and timeliness of this meeting. Reservoirs of viruses in exotic species (e.g. fruit bats for Nipah virus) and in aquatic vertebrates (influenza B virus) were recognized, and their impact on human and animal health was significant. It is the aim of the organizers to have experts on wildlife and zoo animal virology discuss the consequences of trans-species transmission on wildlife, domestic animals and on the human population. These will find the meeting a welcome opportunity to exchange experience and expertise in the monitoring, diagnosis, prevention (including wildlife vaccination) and control of outbreaks. The scientific programme will include the following sessions:

- Transmission between wildlife and domestic species
- Threats to biodiversity and human health
- Epidemiological consequences of ecology changes
- Wildlife population die-offs

Internationally recognized experts will present keynote lectures to introduce the sessions. The scientific advisory board is determined to compose a dynamic and interesting program.

For further information and early registration you are invited to consult the website “www.wildlife2002.nl”.

As a satellite meeting the Dutch Society for Wildlife Health (DSWH) will organize its inaugural conference on June 8, 2002 at the same venue. The central theme is the complex relation between environmental variables and wildlife and human health in the Netherlands. For further information on the DSWH conference, submission of papers and registration please contact J.T.Lumeij@vet.uu.nl.

51st Annual Meeting of the Wildlife Disease Association. July 28–August 1, 2002; Humboldt State University, Arcata, California. Please see details of the meeting under “WDA Activities” in this issue.

Note from the Editor: Please send meeting announcements, diagnostic riddles, position and grant announcements, miscellaneous items, etc. for the *Supplement* to the *Journal of Wildlife Diseases* to Charlotte F. Quist, Wildlife Health Associates, P.O. Box 109, Dillon, MT 59725 USA. Telephone: (406) 683-8325. Email: cquist@bmt.net Double spaced typewritten or electronic mail files in WordPerfect or Microsoft Word are preferred. The deadline for submission of articles for the next issue (April 2002, JWD Vol. 38, No. 2) is February 25, 2002.

LATE POSTINGS!

Assistant Director for the Consortium for Conservation Medicine. The CCM seeks an assistant director beginning in May-June of 2002. The successful candidate will have a DVM or PhD (MPH is an advantage) and a strong interest in the linkage between conservation and health. A proven record of grant writing and publications is required. The assistant director will have responsibility for projects and programs within one or more of the CCM's themes. These include emerging diseases and pathogen pollution, landscape scale disease ecology, marine health and climate change. The successful applicant will work closely with the Executive Director to plan and develop new initiatives in research, education and practical conservation medicine. The assistant director will act as a focal point for liaison with consortial partners, grantmakers, and or international network of affiliates. Applicants should send a full CV and a cover letter detailing professional aims in the field of conservation medicine, the position applied for, and names and addresses (include email) of 4 references to: Dr. Peter Daszak, Executive Director, Consortium for Conservation Medicine, PO Box 1000, 61 Route 9W, Palisades, New York 10964. Closing date for the application is April 15, 2002.

The CCM links centers of excellence at Harvard Medical School, Tufts School of Veterinary Medicine, Wildlife Trust and USGS National Wildlife Health Center. We are based at the Lamont-Doherty campus of Columbia University, in peasant surroundings 25 minutes north of New York City. To learn more about the field of conservation medicine, the CCM or these positions, visit: <http://www.conservationmedicine.org> or email daszak@conservationmedicine.org

Program Assistant, Consortium for Conservation Medicine. The CCM seeks a program assistant to help coordinate research and education programs in conservation medicine. An interest in the linkage between conservation and health are important for this position. An undergraduate degree in biological or environmental sciences is required and postgraduate qualifications or experience are an advantage. Good presentation and writing skills are vital for this position. The program assistant will be responsible for researching, preparing and updating media kits, briefing documents and the CCM website, and coordinating CCM meetings. Applications should include full CV and list of 4 references (include email) to: Dr. Peter Daszak, Executive Director, Consortium for Conservation Medicine, PO Box 1000, 61 Route 9W, Palisades, New York 10964. Closing date for the application is April 15, 2002; the position starts late spring of 2002.

The CCM links centers of excellence at Harvard Medical School, Tufts School of Veterinary Medicine, Wildlife Trust and USGS National Wildlife Health Center. We are based at the Lamont-Doherty campus of Columbia University, in peasant surroundings 25 minutes north of New York City. To learn more about the field of conservation medicine, the CCM or these positions, visit: <http://www.conservationmedicine.org> or email daszak@conservationmedicine.org

Veterinary Intern—Marine Mammal Center. The Marine Mammal Center has an exciting opportunity for a Veterinary Intern to work in our Veterinary Science Department. This position is scheduled to start around mid-March and will last for one year. The position requires a DVM degree or equivalent and previous marine mammal or wildlife experience is a plus. The Marine Mammal Center veterinary staff includes two full-time veterinarians, three veterinary technicians, staff parasitologist, and a medical laboratory technician. The Veterinary Intern's responsibilities include assisting the veterinary medical staff in providing medical management of a large number of stranded marine mammals; mostly pinnipeds. The Intern will be responsible for post mortem examinations, sample-taking for various research projects, and record-keeping. A research paper or case report should be completed during the internship. If qualified, send your CV, letter of intent and three professional references to Director of Human Resources, The Marine Mammal Center, Marin Headlands, 1065 Fort Cronkhite, Sausalito, CA 94965-2609 Equal Opportunity Employer. The deadline for applications is January 15, 2002.