SCWDS BRIEFS

A Quarterly Newsletter from the

Southeastern Cooperative Wildlife Disease Study
College of Veterinary Medicine
The University of Georgia
Athens, Georgia 30602

Gary L. Doster, Editor

Phone (706) 542-1741
FAX (706) 542-5865

Volume 25 **October 2009** **Number 3**

Clams & AI Virus

Wild birds in the orders Anseriformes (waterfowl) and Charadriiformes (gulls, terns, and shorebirds) are the reservoirs for low pathogenicity strains of all known subtypes of avian influenza (AI) virus and are the original source of all Type A influenza viruses that have evolved in domestic poultry, swine, horses, and humans. Replication of AI virus within wild birds occurs primarily in epithelial cells lining the intestinal tract, and high concentrations of infectious virus are excreted in feces. Virus is transmitted between wild birds through the fecal/oral route, in which water plays an important role in facilitating viral spread among birds that use an aquatic environment. In addition to playing an important role in the AI virus wild bird reservoir system, aquatic environments have been implicated as a source of virus transmission to domestic poultry. Despite the recognized importance of water for AI virus transmission and epidemiology, very little is known about viral persistence or stability in this medium. This lack of information greatly hinders our understanding of, and ability to predict, AI virus transmission within wild bird populations or between wild and domestic birds.

One of the major focuses of AI virus research at SCWDS is to address this gap in our knowledge of AI virus in the environment. Using a validated laboratory-based model system, we have examined the effect that various physical or chemical properties of water have on the duration that AI viruses remain infective in a controlled laboratory setting. Some of the viral or environmental factors that have been examined to date include viral subtype, viral pathotype, viral host, and the pH, salinity, and temperature of the water. Collectively, these studies have indicated that under ideal conditions AI viruses are stable in water and can remain infective for long periods. The persistence, however, is greatly influenced by the different properties of the water, even within ranges that occur naturally in aquatic habitats. For example, in our laboratory model system most AI viruses remained infective for several months in cold (4° C) fresh water buffered to a pH of 7.4. Those same viruses, however, were detectable only for several days in fresh water that had an acidic pH (5.8) or a higher temperature (37° C). These persistence data are valuable in guiding environmental sampling efforts for AI virus and also for modeling viral transmission within a wild bird population.

Research evaluating the duration of AI virus infectivity in water has predominately focused on abiotic factors, and the effects of biologic environmental components on viral persistence in aquatic habitats are largely unknown. To begin to address this complex topic, SCWDS scientists recently conducted a study to determine whether filter-feeding bivalves could influence AI virus infectivity in water. The invasive Asiatic clam (*Corbicula fluminea*) was selected as a model organism for this study because it is tolerant to a variety of water conditions that are easily reproduced in a laboratory setting and has a high filtration rate of 1-2 liters/hour/gram of clam tissue. The Asiatic clam is native to Eastern Asia but is established in lakes and rivers throughout the United States south of 40° latitude, where it is found in very high densities.

Clams were collected locally from Sandy Creek in Athens, Georgia, and transported to the laboratory at SCWDS. They were rinsed

Continued…

thoroughly, and a clam was placed in each of 48 tissue culture flasks containing distilled water with supplemental aeration. Ten flasks of distilled water without clams were maintained as negative controls. All 58 flasks were inoculated with a high concentration of a low pathogenic AI virus of wild bird-origin.

At 24 hours post-inoculation, the water in flasks with clams had significantly lower concentrations of infectious virus than water without clams. At 48 hours post-inoculation, infectious virus was not detectable in the water from 40 of the flasks with clams, but was present in all flasks without clams. To further compare the two study groups, the rate of virus decay in the water was calculated, which is referred to as a RT value (the number of days required for a 10-fold decrease in viral infectivity). The average RT value for flasks without a clam was 60 hours, but it was just over 14 hours for flasks with clams. The results of this preliminary trial suggest that the presence of these clams significantly reduced the persistence of AI virus in water.

Based on these data and subsequent trials, the removal of virus from the water apparently was the result of clam filtration. To date, however, attempts to re-isolate virus or detect AI virus genetic material from tissues of exposed clams have been unsuccessful. While this suggests that the AI virus is being sequestered or inactivated in the clam tissue after filtration from the water, it cannot be ruled out that virus was present in the tissue and simply was not detected using standard protocols.

To further examine the influence of filter-feeding bivalves on the infectivity of AI virus in an aquatic habitat, we conducted an experimental infection trial using a modified design from the study described above. For this trial, we used wood ducks (*Aix sponsa*) and a H5N1 highly pathogenic avian influenza (HPAI) virus. Wood ducks are highly susceptible to H5N1 HPAI virus, and previous studies have shown that exposure to even low concentrations of virus can produce detectable infection and death. Consequently, wood ducks are a sensitive indicator of the presence of infectious virus.

Similar to the last trial, tissue culture flasks containing distilled water, with and without an Asiatic clam, were inoculated with high concentrations of a H5N1 HPAI virus. To test for the presence of infectious virus, groups of three wood ducks were exposed to each of the following treatments: water from flasks with a clam, water from flasks without a clam, and tissue from clams that filtered H5N1 HPAI virus. Three unexposed wood ducks were maintained as negative controls. All of the wood ducks exposed to water from flasks without a clam died within six days. Wood ducks exposed to the clam tissue or water from flasks with a clam, however, did not exhibit morbidity or mortality, nor did they shed virus or seroconvert, all of which indicated that they were not infected. The results of this study were consistent with the previous trial and provide further evidence that the clams filtered AI virus from the water, and minimal, if any, infectious virus was retained within the clam tissues.

These studies show that the Asiatic clam can remove AI virus from water and, consequently, may influence AI persistence in an aquatic habitat. Based on these preliminary findings, infectious virus does not appear to accumulate in clam tissues, suggesting the clams have little potential to serve as vectors for AI virus transmission. Additional studies, however, currently are underway to further examine the distribution and infectivity of virus within clam tissues after filtration from the water. Such information may facilitate future attempts at virus isolation or detection from AI-exposed clam tissue. Additionally, it is important to note that this study only evaluated filtration by a single species of clam, and it is possible that the fate of AI virus after filtration from water may vary between different species of clams or other filter-feeding organisms.

Under natural conditions, filter-feeding bivalves likely are not a major factor in the transmission of AI virus in wild birds in an aquatic habitat. Rather, the primary importance of this research lies in the proof that biotic environmental factors can impact AI persistence in water and, consequently, AI transmission. The ecology of AI virus is

Continued…

complex. Multiple dynamic variables relating to host, virus, and environment interact and can affect infectivity and transmission. The role of the aquatic environment in AI virus ecology and epidemiology has, until recently, been largely ignored, and numerous gaps remain in our knowledge of this important subject. Consequently, additional research projects are warranted that use a combination of laboratory experiments and field studies. This AI environmental persistence research was funded by the Centers for Disease Control and Prevention. Additional details on the AI virus clam study described here can be found in the *Proceedings of the Royal Society B* (2009) 276, 3725-3735. (Prepared by Justin Brown)

SCWDS Funded to Study WNS

SCWDS personnel and collaborators at Northern Kentucky University recently received $155,000 from the U.S. Fish and Wildlife Service to study white-nose syndrome (WNS) of bats and to develop methods to better diagnose the disease, prevent its spread, and, if possible, to control it. The project is titled "The Propagation and Decontamination of White-Nose Syndrome in the Environment" and represents a joint effort between SCWDS and the project's Primary Investigator, Dr. Hazel Barton with Northern Kentucky University.

A major goal of the proposed research is to identify compounds that kill *Geomyces destructans,* the fungus identified as the causative agent of WNS. It is imperative that such compounds kill the pathogen without harming a broad spectrum of other fungi. Effective compounds we identify should be nontoxic to vertebrates and invertebrates and of potential use as a topical treatment for bats. Furthermore, the compounds must not harm caving or other gear on which they will be used.

We also will be seeking to overcome the difficulties of culturing *G. destructans*. We will work to identify media that enhance rapid growth of the fungus, because it grows slowly on available media and often is overgrown by other fungi. Finding better media will allow us to select for the pathogen quickly and shorten the time it takes to confirm diagnosis and to conduct experiments that depend on its propagation. We also will work to refine diagnostic methods to more quickly identify infected bats. (Prepared by Kevin Keel)

USDA Program Changes Proposed

On October 5, 2009, Veterinary Services of the USDA's Animal and Plant Health Inspection Service (APHIS-VS) announced the availability of two new concept papers for bovine tuberculosis (TB) and bovine brucellosis. Bovine TB and bovine brucellosis have been targeted for eradication from cattle through cooperative state-federal efforts, and significant progress has been made. However, unique challenges continue to impede total elimination of either disease. The two concept papers present APHIS-VS' current thinking about changes the agency is considering for the bovine TB and brucellosis programs. The agency hopes the two papers stimulate critical feedback and invites partners and stakeholders to submit their comments by December 4, 2009.

One of the primary challenges to the programs is the involvement of wildlife reservoirs. Bovine TB and brucellosis were introduced into the United States many years ago via imported cattle, subsequently spilled over from livestock to native wildlife, and became established in wild populations in limited areas. The presence of bovine TB and brucellosis in wildlife was of little consequence until the diseases had been all but eradicated from livestock, and the remaining wildlife reservoirs became a potential source of transmission to livestock. The presence of bovine TB and brucellosis in wild animals never has affected the disease status of livestock, i.e. a state can be considered free of bovine TB or brucellosis if they are not detected in domestic livestock, regardless of their presence in free-ranging wildlife.

The bovine TB eradication program for cattle was initiated in 1917. Since that time, the national bovine TB prevalence rate has dropped from 5% of cattle herds to less than 0.001%. However, the ultimate goal of

Continued…

eradication remains elusive, because bovine TB continues to be detected sporadically in livestock herds. Challenges that hinder eradication efforts include:

- Most bovine TB-infected cattle detected at slaughter are imported, primarily from Mexico, despite significant reduction in bovine TB prevalence in all Mexican states.
- Since 1995, endemic bovine TB has been identified in free-ranging white-tailed deer in the northeastern lower peninsula of Michigan. This wildlife reservoir continues to impact the cattle program.
- A localized bovine TB focus was recognized in 2005 in cattle herds and wild deer in northwestern Minnesota. The significance of the wildlife infections to the cattle industry and bovine TB eradication currently is unclear.
- Today's cattle industries feature fewer herds of larger size, greater specialization, and more frequent and longer distance movement of animals, all resulting in increased risks of bovine TB transmission.
- The lack of a fully implemented national animal identification system impedes the ability to identify affected herds.
- Tuberculin skin testing, the primary diagnostic tool for bovine TB, and other tests fail to detect all infected cattle.

In view of the above challenges, APHIS-VS has developed a proposed action plan that will:

- Reduce the introduction of bovine TB into United States cattle herds by applying additional import requirements for Mexican cattle and enhancing efforts to mitigate risks from wildlife.
- Enhance bovine TB surveillance by crafting a comprehensive national surveillance plan and accelerating diagnostic test development.
- Expand options for managing bovine TB-infected herds by conducting epidemiological risk assessments, applying whole herd depopulation judiciously and developing alternate control strategies, and applying animal identification standards.
- Modernize the regulatory framework to allow APHIS-VS to focus resources where bovine TB exists.
- Transition the bovine TB program from a state classification system to a science-based zoning approach to address disease risk.

The national program to eliminate bovine brucellosis was launched in 1934. The program has evolved extensively, particularly in the 1960s and 1970s, and by 1989, 27 states were classified as brucellosis free. However, finding the last cases of brucellosis in livestock was difficult and costly. By 2007, the national prevalence rate had dropped to an all-time low of one affected herd in approximately 1,000,000 cattle herds. In 2004 and 2006, respectively, Wyoming and Idaho lost their Class-Free status, but regained it by February 2008 when, for the first time in the history of the national brucellosis program, all 50 states were classified as Class-Free. However, Montana lost its Class-Free status in September 2008 after brucellosis was detected in two cattle herds. Although Montana, like Wyoming and Idaho, has regained its Class-Free status, cattle in the Greater Yellowstone Area (GYA), which comprises parts of all three states, remain at risk of exposure to brucellosis-infected wildlife populations that were implicated as sources of the cattle infections that cost these states their Class-Free status.

Despite the successes of the cooperative federal-state-industry national brucellosis eradication program, final eradication currently is not deemed possible without new strategies to address the current challenges that include:

- Finding the last remaining brucellosis-reactor animal, the last remaining brucellosis-affected cattle herd, and eliminating brucellosis from wildlife.

Continued…

- Wild bison and elk in the GYA are the last known bovine brucellosis reservoirs in the country.
- Until bovine brucellosis can be eliminated from wildlife, all potential exposure and transmission risks from infected wildlife populations must be mitigated.
- APHIS-VS and state agencies must be able to apply limited resources effectively and efficiently to the unique risk associated with the wildlife reservoir.

The successes of the long-standing brucellosis program have been the result of adapting program activities to be more effective. APHIS-VS has drafted an action plan to address the remaining challenges to the eradication program. The new action plan is designed to:

- Demonstrate the disease-free status of the United States through a national status-based program supported by a national surveillance strategy.
- Enhance efforts to mitigate disease transmission from wildlife.
- Enhance disease response and control measures.
- Modernize the regulatory framework to allow APHIS-VS to address risks quickly and sensibly.
- Implement a risk-based disease management area concept.

To succeed, the new approaches to bovine TB and brucellosis will require continuation of APHIS-VS partnerships with animal health and wildlife officials in the affected states, other federal agencies, industry, international partners, academia, and other stakeholders. Successful partnerships will allow APHIS-VS and others to use the limited available resources efficiently to achieve the program objectives and protect the national livestock herd.

The complete concept papers and instructions to submit comments can be found in the *Federal Register* (Vol. 74, No. 191) at regulations.gov. (Prepared by John Fischer with text from APHIS-VS publications)

TB in Captive Cervids

Bovine tuberculosis (TB) continues to pop up sporadically in captive deer and elk in the United States, despite a long-term national program to eradicate it from the commercial cervid industry. In April of this year, a captive elk in Knox County, Nebraska, was diagnosed with *Mycobacterium bovis*, resulting in quarantine of the herd of captive elk and fallow deer. This farm is geographically isolated and poses little threat of contact with cattle or other livestock in the area, although wildlife is abundant in this region. Subsequently, the Nebraska Game and Parks Commission and USDA's Animal and Plant Health Inspection Service (APHIS) collected 42 free-ranging white-tailed deer in the vicinity, but found no infected animals. In an apparently unrelated event, bovine TB was detected in June 2009 in a Rock County, Nebraska, cattle herd approximately 75 miles from the infected elk herd. The bacterial strains affecting the captive cervid and cattle herds differ genetically, which supports the belief that there is no connection between the two events.

In May 2009, a red deer from a multi-species captive cervid herd in Franklin County, Indiana, tested bovine TB-positive at slaughter. The herd contained captive elk, red deer, fallow deer, and sika deer and is near a cattle herd in which bovine TB was detected in December 2008. The genetic profiles of the isolates of *M. bovis* from the cattle and red deer are identical. Captive cervids in additional Indiana herds that had received animals from the Franklin County facility were tested, and two more infected herds were detected in Wayne and Harrison counties. All three infected captive cervid operations are directly linked through the purchase and movement of animals. The herds from Franklin and Wayne counties have been depopulated, and all animals in the Harrison County herd are scheduled for depopulation. Extensive surveillance of free-ranging white-tailed deer by the Indiana Department of Natural Resources (DNR) and the Indiana

Continued…

State Board of Animal Health is planned for the November 2009 deer hunting season in all three counties. Results are negative on 30 wild deer that were collected earlier by the DNR in Franklin County and submitted for diagnostic testing.

Bovine TB first emerged as a significant problem in the North American captive cervid industry in 1990. Initially, epidemiological investigations of an infected Alberta, Canada, captive elk facility pointed to a captive herd in Montana as the source. However, subsequent investigations showed that the Montana herd received elk in 1987 from a captive herd in Nebraska that later was shown to have infected cattle and deer. The Nebraska herd was traced to an animal sale in 1980 that may have been linked to an earlier bovine TB outbreak in South Dakota, suggesting that bovine TB may have been lurking in the industry for many years before it was recognized.

From January 1991 through October 1993, bovine TB was confirmed in 23 captive cervid herds in 13 states. In addition, six herds of infected cattle or bison were associated with tuberculous captive cervids. Several problems contributed to the dramatic spread of bovine TB within the captive cervid industry:

- Although relatively efficient at detecting infection on a herd basis, available skin tests were unreliable in identifying infected individual animals.
- The Federal-State Bovine Tuberculosis Eradication Program pertained only to cattle and bison. Federal regulations for interstate movement of infected or exposed captive cervids were lacking.
- Authority to control importation or to quarantine and test captive cervid species varied greatly among states, and few states had provisions to pay indemnity for animals destroyed in bovine TB control operations.

By 1993, APHIS published voluntary guidelines to serve as a blueprint for a national bovine TB eradication program for captive cervids. Meanwhile, authority remained with the states. In 1994, an addendum to the Uniform Methods and Rules (UM&R) for Tuberculosis Eradication extended coverage to captive cervids. The UM&R outlined minimum program standards and procedures to control bovine TB. In 1995, the UM&R was amended again, and federal indemnity provisions were initiated to partially pay owners for captive cervids that were destroyed to control bovine TB.

By 1999, APHIS had published a Final Rule that amended federal regulations pertaining to bovine TB by adding provisions for members of the cervid family (deer, elk, and moose). The regulations set standards for bovine TB testing for captive cervids moved interstate or exported to other countries. In addition, a voluntary herd accreditation program was developed. The federal program has undergone additional changes since it was first implemented.

All of these developments, and others, combined to greatly reduce bovine TB among captive cervids: In the federal fiscal year 1995 (FY95), only two new infected herds were identified, and no new infected herds were found in FY96. From 2000-2003, only three new infected herds were detected, bringing the national total since 1991 to 40.

Great progress has been made in the effort to eliminate bovine TB from the captive cervid industry in the United States. The cooperative federal-state-industry program has brought the once alarming bovine TB situation much closer to control. However, the occasional cases that continue to appear among captive deer and elk, as seen in 2009 in Indiana and Nebraska, indicate that bovine TB has not yet been eliminated from the industry, and continued vigilance and adherence to control measures will be essential in its eradication. (Prepared by Annie Widdell, University of Minnesota Veterinary Student, and John Fischer)

CWD Prions in Deer Feces

Research recently published in the journal *Nature* confirms that mule deer infected with the prion that causes chronic wasting disease

Continued…

(CWD) shed the infectious particles in feces for months before they develop clinical signs. It previously has been reported that urine, saliva, muscle, blood, and antler velvet from clinically affected animals contain the prions that cause CWD, but the role of these sources in sustaining CWD epidemics remains unclear. However, long-term exposure of susceptible animals to the causative agent shed in feces could explain the apparently efficient horizontal transmission of this disease.

In the recently reported project, researchers orally inoculated mule deer with the CWD agent. Fecal samples were collected from deer prior to inoculation and at 3- to 6-month intervals after inoculation until the deer died or developed clinical signs of CWD. The fecal samples were irradiated to damage nucleic acids and inactivate bacteria and viruses within the feces, with minimal effects on prion levels. The irradiated samples were inoculated directly into the brains of transgenic mice that over-express cervid prion protein and are extremely susceptible to CWD. Most (14/15) fecal samples collected four months or later after inoculation were able to transmit the disease to the mice. Infectivity of samples was detected from 7 to 11 months before clinical signs were observed in the deer. Once fecal excretion of the prion began, it continued at a fairly steady rate until death.

The mouse bioassay indicated the quantity of infectious prions in any given fecal sample was much smaller than that in the brain of an animal in the terminal stages of CWD. However, the continuous fecal excretion of smaller amounts of infectious material for a long period of time results in a large total deposition of the prion in the environment. The dissemination of the prion in feces could provide an efficient means of transmission to other deer through the contamination of soil and forage. The entire article, by G. Tamguney et al., can be found in *Nature* 2009 Sep 24;461(7263):529-32. (Prepared by Kevin Keel)

TWS Position Statement on Lead

At its recent meeting in Chicago, The Wildlife Society (TWS) Council approved a position statement "*Lead in Ammunition and Fishing Tackle*." This statement was drafted by a committee of experts, preliminarily approved by Council, and was made available for member review and comment. More than 60 comments were received and considered by Council, which has revised the statement accordingly. The statement is available at http://joomla.wildlife.org/documents/positionstatements/Lead_final_2009.pdf. Pursuant to TWS policy, the statement will be reviewed in five years.

The position statement is based on scientific data in the 2008 technical review of TWS and the American Fisheries Society "*Sources and Implications of Lead Ammunition and Fishing Tackle on Natural Resources*," which is available for purchase through TWS' website https://bookstore.wildlife.org/Details.cfm?ProdID=596&category=.

The policy of TWS in regard to lead in ammunition and fishing tackle is to:

1. Recognize that lead has been known for centuries to be a broad-spectrum toxicant to humans and wildlife.
2. Advocate the replacement of lead-based ammunition and fishing tackle with nontoxic products, while recognizing that complete replacement may not be possible in specific circumstances.
3. Recognize that the removal of lead for hunting, fishing, and shooting will require collaboration among affected stakeholders (including wildlife professionals, ammunition and tackle manufacturers, sportsmen, policymakers, and the public). It may require a phased-in approach, and will require explicit and targeted educational strategies at both the national and international levels, thereby acknowledging and supporting the crucial role that hunters and anglers play in wildlife management and conservation.

Continued…

4. Encourage studies on reducing barriers to the development of nontoxic ammunition and fishing tackle, additional research that generates toxicological and environmental chemistry data, monitoring and modeling of exposure effects, and studies predicting consequences of exposure and long-term population-level effects. The need for additional information, however, should not delay the educational efforts and the phasing-in of nontoxic ammunition and tackle where practicable.
5. Support educational efforts to promote greater public awareness and understanding of the consequences of lead exposure to wildlife populations and emphasize the potential gains for wildlife and environmental quality from use of nontoxic ammunition and fishing tackle.

Questions about the new position statement should be directed to Laura Bies, Director of Government Affairs, at laura@wildlife.org. (Prepared by Gary Doster)

New Brochure for Hog Hunters

The Centers for Disease Control and Prevention (CDC) and USDA's Animal and Plant Health Inspection Service have collaborated to produce a brochure warning hunters of the potential danger of acquiring diseases from field dressing or handling uncooked meat from wild swine. The brochure is entitled "*Wild Hog Hunting, Stay Healthy on Your Hunt*." Although the brochure states that there "are more than 24 diseases that people can get from wild hogs," the main focus of this brochure is swine brucellosis.

The brochure provides a synopsis of the symptoms, diagnosis, and treatment of swine brucellosis in humans and recommends a list of common sense precautions that one should take when handing wild swine carcasses or meat. This is a valuable source of information that should be widely distributed to hunters in the 35 states where wild swine now occur, and it should be welcomed by the hunters it is designed to protect.

The brochure may be accessed online at: http://www.cdc.gov/Features/HuntingSafety/Brucellosis_and_Hoghunters_508.pdf (Prepared by Gary Doster)

WDA Awards For SCWDS Staff

David Stallknecht and Buffy Howerth have been a close-working husband and wife team for many years and have contributed greatly to our knowledge of some important diseases of wildlife. Buffy and Dave are acknowledged worldwide as authorities on the epidemiology and pathology of diseases affecting wildlife, as well as human and domestic animal diseases involving wildlife, and vector-borne viral diseases of humans and wild and domestic animals. They are especially known for their research on epizootic hemorrhagic disease virus and bluetongue virus in white-tailed deer and other species.

The impressive service records of Buffy and Dave were recognized at the 58th annual meeting of the Wildlife Disease Association (WDA) held in Blaine, Washington, August 2-6, 2009, when they were jointly awarded the WDA's Distinguished Service Award (DSA). The DSA is the highest award of the Wildlife Disease Association, and its purpose is to honor long time WDA members who, "by his/her outstanding accomplishments in research, teaching and other activities, including participation in WDA affairs, has made a noteworthy contribution furthering the aims of the Wildlife Disease Association." This truly is a distinguished award and no one is more deserving than Buffy and Dave.

Buffy and Dave were recommended for the award by professional colleagues and friends, who stated in their letter of recommendation to the WDA Awards Committee: "The record of service of Buffy and Dave together is an outstanding model of commitment and service to one's profession. Collectively, they have served 6 years on the WDA Council, 23 years as assistant editors to the Journal of Wildlife Diseases, and 10 years as Editor of the Journal. They are both broadly published with more than 200 papers between them, and they have been authors of more than 200 papers at meetings, many of which have

Continued…

enriched the WDA conferences over past decades. In addition, they are both well known for their contributions to education at The University of Georgia, at both undergraduate and graduate levels."

As evidence of their commitment to their academic responsibilities, Buffy has been major professor for 13 graduate students and has served on the advisory committee for 34 additional graduate students. Dave has served as major professor for 10 graduate students and as an advisory committee member for 24 additional graduate students.

Previous SCWDS affiliates who have received this prestigious honor were Katherine Prestwood in 1988, Victor Nettles in 1995, and Randy Davidson in 1998. SCWDS staff members who won the equally prestigious WDA Emeritus Award after their retirement were Frank Hayes in 1988, Victor Nettles in 2001, and Randy Davidson in 2007. We are proud of them all.

Another SCWDS staff member, Dr. Mark Ruder, was this year's winner of the WDA Graduate Student Scholarship Award, which also was presented at this year's annual conference in Blaine, Washington. The scholarship is awarded annually to a student who is pursuing a masters or doctoral degree specializing in research on wildlife disease. In addition to a plaque and recognition at the awards banquet, the scholarship carries a cash value of $2,000 for use for fees, books, supplies, equipment, and other educational expenses.

Mark earned a DVM degree at Kansas State University and joined SCWDS in June 2008 to pursue a PhD degree in veterinary pathology and to work as a diagnostician on SCWDS clinical cases. Our sincere congratulations and best wishes to Buffy, Dave, and Mark. (Prepared by Gary Doster)

••

••

Information on SCWDS and recent back issues of the *SCWDS BRIEFS* can be accessed on the internet at www.scwds.org. The BRIEFS are posted on the web site at least 10 days before copies are available via snail mail. If you prefer to read the BRIEFS online, just send an email to Gary Doster (gdoster@uga.edu) or Michael Yabsley (myabsley@uga.edu) and you will be informed each quarter when the latest issue is available.

SCWDS BRIEFS

Southeastern Cooperative Wildlife Disease Study
College of Veterinary Medicine
The University of Georgia
Athens, Georgia 30602-4393

RETURN SERVICE REQUESTED