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SCWDS BRIEFS

A Quarterly Newsletter from the

Southeastern Cooperative Wildlife Disease Study
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SCWDS Celebrates 50 Years

July 1, 2007, will mark the 50th anniversary of the Southeastern Cooperative Wildlife Disease Study (SCWDS) based at the University of Georgia's College of Veterinary Medicine. During 2007, a series of articles will appear in the *SCWDS BRIEFS* that narrate its history and relate some notable SCWDS activities and events of the last 50 years. This first article of the series describes how SCWDS became established.

The SCWDS story began after World War II when game management agencies throughout the Southeast were pouring resources into restoration of white-tailed deer populations that were depleted during the pre-conservation era. The immediate results were limited, but spectacular, and agencies were proud of the progress that had been made. However, a formidable disease threat to deer restoration soon emerged when, in 1949, fisherman in several states found large numbers of bloated deer carcasses along streams in the late summer and early fall. In some areas, more than 90% of the deer population fell victim to this mysterious disease of undetermined cause, known only as "Killer X." Fortunately, Killer X vanished as quickly as it had appeared and regional deer restoration programs flourished in the early 1950s.

But Killer X returned at the same time of year in 1954 and hit even harder in 1955, when heavy deer mortality occurred from the Appalachians into the Ozarks, and grave concern arose for the future well-being of newly restored deer populations. Facilities were not available to investigate widespread deer deaths and once again Killer X disappeared with colder weather and without identification of its cause. Sportsmen, conservationists, and the general public found this situation untenable and wanted action; however, it would have been too costly for any single state to establish and maintain an organization with the expertise and capabilities to cope with future deer mortality crises, so a cooperative approach was considered.

After careful deliberation, it was agreed that a joint-state organization should be established for the region, and on July 1, 1957, the Southeastern Association of Game and Fish Commissioners (SEAGFC) founded the Southeastern Cooperative **Deer** Disease Study (SC**D**DS). Headquartered at the University of Georgia's College of Veterinary Medicine in Athens and directed by Dr. Frank A. Hayes, the SCDDS mission was to investigate the mysterious deer mortality. The initial annual budget of $18,000 was provided by equal amounts contributed by each of the 11 southeastern state wildlife management agencies who were members of the cooperative. Member states later grew to 13, then to 15, and now number 17. Current members are the wildlife resource agencies of Alabama, Arkansas, Florida, Georgia, Kansas, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Ohio, Puerto Rico, South Carolina, Tennessee, Virginia, and West Virginia. The two newest members, Kansas and Ohio, are from the Midwestern Association of Fish and Wildlife Agencies.

Shortly after the inception of SCDDS, those involved became increasingly aware of the dearth of information on white-tailed deer diseases. In addition to requests to develop

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data on deer diseases, there was increasing pressure on SCDDS' small staff to procure vital information on potential disease interrelationships between wild animals and humans or domestic animals. Recognizing the increasing demands upon the newly created Deer Disease Study, in 1960 SEAGFC expanded its mission to encompass all wildlife species and changed its name to the Southeastern Cooperative **Wildlife** Disease Study (SC**W**DS), as it is known today. Additionally, through the interest and efforts of SEAGFC, in 1963 the United States Congress enacted a recurring annual appropriation administered through the U.S. Department of the Interior to support basic wildlife disease research conducted by SCWDS. Through these means, efforts began to close information gaps about diseases in wild animals and elucidate disease interactions between wildlife, domestic animals, and humans. To be continued…

More Bovine TB in Minnesota

Bovine tuberculosis (TB) recently was found in five more free-ranging white-tailed deer and in two more cattle herds in northwestern Minnesota. The five deer, regarded as "presumptive positive" on the basis of PCR results, were among approximately 950 hunter-killed deer examined for TB lesions in the affected area. The detection of TB in these deer brings the total of affected wild deer in the state to seven. An additional 4,050 hunter-killed deer from throughout the state also are being tested by culturing lymph nodes for *Mycobacterium bovis*, the causative bacterium. Results of these tests are pending.

Bovine TB was first detected in Minnesota in a beef cattle herd in mid-2005 in an agricultural area in Roseau County in the northwestern portion of the state. Subsequent epidemiological investigations by the Minnesota Board of Animal Health (MN BAH) identified four more infected herds through 2005; detections of the sixth and seventh infected cattle herds were announced in October 2006. The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS) downgraded Minnesota's TB status from Accredited-Free to Modified Accredited Advanced in January 2006.

The first case of TB found in a free-ranging white-tailed deer in Minnesota came from a hunter-killed whitetail harvested in Roseau County in autumn 2005 within one mile of an infected cattle herd (see *SCWDS BRIEFS* Vol. 21, No. 4). A second positive deer was found among 90 additional deer sampled from January–May 2006, when the Minnesota Department of Natural Resources (MN DNR) issued special deer shooting permits to landowners with infected cattle, in an effort to reduce the number of potentially exposed deer. The infections in wild deer are regarded as likely spillover from infected cattle herds in the area. The original source of the infection remains unknown; however, the bacterial isolates from cattle and deer in the area are genetically consistent and similar to *M. bovis* strains found in the southwestern U.S. and Mexico.

Minnesota's DNR and BAH have taken aggressive action to eliminate the bovine TB problem and restore the state's TB Accredited-Free status. Baiting, which has been prohibited in Minnesota since 1991, and supplemental feeding of free-ranging cervids are not regarded as significant factors in TB epidemiology in wild deer in northwestern Minnesota as they are in the northeastern portion of Michigan's Lower Peninsula. Supplemental deer and elk feeding, which never has been practiced on a large-scale in northwestern Minnesota, was banned in autumn 2006 in a 4,000-square-mile area that includes the affected region. On January 26, 2007, the MN DNR announced that it will contract with USDA-APHIS-Wildlife Services to kill deer to temporarily reduce deer populations in the affected area to minimize chances that bovine TB will spread from deer to deer or from deer to cattle. Wildlife Services sharpshooters will kill deer on public land and on private land with the owners' permission in a 6-mile radius surrounding infected cattle farms near Skime, Minnesota. The MN DNR will continue to issue special shooting permits to landowners in the affected area and, following analysis of the results, will consider additional management

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options, possibly including liberalized hunting seasons, special hunts, and/or bonus permits.

All seven infected cattle herds have been depopulated and the MN BAH has stepped up testing of cattle throughout the state in addition to extensive testing of herds in the affected region. During the 2006 session, the Minnesota state legislature passed supplemental funding of nearly $700,000 to be used for TB testing and related activities over the next two years and increased MN BAH authority to test animals for bovine TB. The legislature also appropriated $54,000 for the MN DNR to help livestock producers protect their stored forage from free-ranging deer. Livestock producers within a 5-mile radius of an infected cattle herd can receive up to $5,000 worth of deer-proof fencing. The Minnesota legislature also passed a tax credit for cattle producers who test their herds for bovine TB.

For more information on bovine TB in Minnesota cattle and deer, see the websites of the MN BAH (www.bah.state.mn.us) and the MN DNR (www.dnr.state.mn.us/index.html). (Prepared by John Fischer)

Developments in CWD Surveillance and Research

No new foci of chronic wasting disease (CWD) were identified in 2006; however, there was some expansion of areas known to be affected. The Wyoming Game and Fish Department recently reported CWD-positive deer and elk in previously unaffected hunt units adjacent to CWD-positive areas in Wyoming and South Dakota. Similarly, additional cases have been detected in Alberta, just across the border from a CWD-endemic region of Saskatchewan.

The affected region of West Virginia apparently has not expanded, and CWD remains confined to a very small area near the town of Slanesville. A total of 10 CWD-positive animals have now been identified in the region. No additional CWD-positive deer have been identified in New York since April 2005, although intensive surveillance continues in the containment area in Oneida and Madison counties.

Two additional bull moose killed by hunters in Colorado have tested positive for CWD, bringing the total to three. All came from a small area in north-central Colorado.

Researchers continue to make significant discoveries concerning CWD. A group of Colorado State University researchers with collaborators from other institutions recently infected naïve deer with CWD by inoculating them orally with saliva or intravenously with blood from CWD-positive donor deer (Mathiason et al., 2006, *Science*, Vol. 314, No. 5796). Deer orally inoculated with urine and feces remained negative on tonsil biopsy throughout the 18-month study. This was surprising because excreta traditionally has been assumed to be a likely source of CWD transmission and because the apparent presence of the highly resistant CWD agent in saliva suggests that it could pass through the gastrointestinal system and be present in feces. The authors made the point that even though inoculation of urine or feces did not lead to disease in this study, it is premature to completely rule them out as potential sources of transmission. They cited "small sample size, elective preclinical termination, and potential variation in individual susceptibility" as potential limitations in interpretation of these data, and indicated that further research is needed to address the potential presence of infectious CWD prions in excreta of CWD-positive deer.

Researchers at the University of Wyoming recently examined heart and skeletal muscle from CWD-infected white-tailed deer, mule deer, elk, and one moose for the presence of CWD prions (Jewell et al., 2006, *Journal of General Virology* Vol. 87, No. 11). Although samples of heart and six muscles throughout the body were examined by ELISA, Western immunoblot, and immunohistochemistry, only heart muscle tested positive in 7 of 16 CWD-infected whitetails and in 12 of 17 infected elk. None of the 13 CWD-infected mule deer or the single CWD-positive moose examined had detectable CWD prions in heart or other muscles. Although the assays used were very specific, they may not be as

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sensitive in detecting the presence of CWD-associated prions as inoculation of susceptible deer or "cervidized" mice with potentially infective material. Previously, Angers et al. (2006, *Science*, Vol. 311, No. 5764), demonstrated infectivity of skeletal muscles by inoculating cervidized mice intracerebrally with muscle homogenate from CWD-infected cervids (see *SCWDS BRIEFS* Vol 21, No. 4). These reports expand the known distribution of the CWD prion in infected animals; however, it is believed that the infectious protein is much more abundant in tissues of the central nervous system, particularly in animals in advanced stages of clinical disease.

Concern for potential human infection with CWD compelled another group to search for any evidence that human populations that include people who eat venison from deer or elk with CWD are at greater risk for developing transmissible spongiform encephalopathies (MaWhinney et al., 2006, *Emerging Infectious Diseases*, Vol.12, No. 10). The investigators examined the prevalence of Creutzfeldt-Jakob disease (CJD) among people in several Colorado counties with a high prevalence of CWD in free-ranging cervids. In this region, 75% of hunting licenses are issued locally, indicating local hunters account for the majority of hunting activity. Between 1979 and 2001, CJD prevalence was no higher in people in this area than for other populations, and the prevalence actually decreased slightly over time. As with previous research, this study does not conclude that it is impossible for humans to develop CJD from eating meat from animals with CWD; however, it does reinforce the fact that CWD represents an extremely low zoonotic risk, if any at all.

A recent publication by Miller et al. (*Ecological Applications*, 2006, Vol. 16, No. 6) identified the potential importance of indirect environmental transmission of CWD. Six computer models were developed to compare alternative pathways of CWD transmission in deer. The possible modes of transmission evaluated were direct transmission, direct transmission with latency, direct transmission with an incubation period, indirect transmission, indirect transmission with a latent period, and a combination of direct and indirect transmission. Using data from two actual CWD outbreaks in captive mule deer, the researchers concluded that indirect environmental transmission was likely the most important mechanism of CWD transmission. This is supported by previous research confirming that mule deer can become infected when housed in a paddock in which the carcasses of deer with CWD had decomposed (*SCWDS BRIEFS* Vol. 20, No. 2).

The relationship of CWD prevalence to deer density was supported by a recent study characterizing the spatial epidemiology of CWD in white-tailed deer in Wisconsin (Joly et al., 2006, *Journal of Wildlife Diseases* Vol. 42, No. 3). The prevalence of CWD declined with increasing distance from a central location and was correlated with the abundance of deer habitat. It is assumed that the central location represents the point of introduction of CWD and the abundance of deer habitat is associated with deer density. The data also indicated that CWD was clustered geographically. The authors propose that knowledge of spatial distribution of CWD could be useful in management decisions, such as targeted culling of deer in small high-prevalence areas. Such hypotheses, however, warrant additional testing.

We cannot update CWD-related developments without recognizing Bruce Morrison, who retired from the Nebraska Game and Parks Commission in late November 2006. He was heavily involved with CWD in Nebraska, as well as at the regional and national levels. In 2002, Bruce chaired the Implementation Committee that drafted the action plan for the national CWD management plan and received the Special Recognition Award from the International Association of Fish and Wildlife Agencies. In recent years, he personally authored and distributed numerous and timely "CWD Updates" to hundreds of interested persons around the country. Bruce and his wife have returned to their native New Mexico where he hopes to reconnect with two favorite outdoor activities - fly fishing and elk hunting. We thank Bruce for his hard work and commitment to wildlife resources and wish him the best. (Prepared by Kevin Keel)

Federal CWD Rule Update

On January 3, 2007, the period for comments closed on three petitions concerning the Final Rule on Chronic Wasting Disease (CWD) Herd Certification Program and Interstate Movement of Farmed or Captive Deer, Elk, and Moose published by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS) on July 21, 2006. The petitions were submitted by the Association of Fish and Wildlife Agencies, the National Assembly of State Animal Health Officials, and the U.S. Animal Health Association and focused primarily on interstate shipping regulations and federal preemption of state regulations more stringent than those of the USDA-AHPIS final rule. The petitions requested a delay in the scheduled October 2006 implementation of the rule. On September 8, 2006, APHIS published a notice delaying implementation of the rule while the issues in the petitions are addressed.

During the comment period, USDA-APHIS received 95 responses, representing a wide variety of positions and suggestions. Personnel with USDA-APHIS will review the comments and seek to produce an acceptable solution to the petitions and comments. If substantive changes are made, it may be necessary to re-publish the rule with another open comment period. Although a timeline is not established for this process, USDA-APHIS wants to resolve this issue as soon as possible. Comments on the petitions can be viewed on-line at www.regulations.gov by selecting to view all document types within the APHIS agency section while using the keywords "Chronic Wasting." (Prepared by John Fischer)

Tularemia in Backyard Wildlife

On July 24, 2006, the Minnesota Department of Health Laboratory confirmed tularemia in a sick gray squirrel that was submitted to the University of Minnesota Veterinary Diagnostic Laboratory. The squirrel had been found on July 21 in the city of St. Cloud on the Mississippi River in central Minnesota. The homeowners who submitted the squirrel reported observing 6-7 dead squirrels, 6-7 dead eastern cottontail rabbits, and 3-4 dead eastern chipmunks in their yard and two adjacent yards in the previous four weeks. A second gray squirrel, found dead on July 24 and submitted for testing, also cultured positive for *Francisella tularensis*, the bacterium that causes tularemia. Both isolates were *F. tularensis*, biovar *tularensis*, which is classified as Type A.

Tularemia, a life-threatening human disease, also known as rabbit fever, has been reported in more than 200 vertebrate species, most frequently in rabbits and rodents. In North American wildlife, tularemia due to infection with the Type A bacterium generally occurs in a terrestrial cycle mainly involving rabbits, rodents, and arthropod vectors. Infection of North American wildlife with *F. tularensis*, biovar *palaeoarctica*, also known as Type B, is characterized by an aquatic cycle involving mainly muskrats, beavers, and a water-borne transmission route. Type A bacteria are much more virulent than Type B and are regarded as a potential bioterrorism weapon.

A field investigation of the St. Cloud site on July 27 revealed a small yard in a residential area in the center of the city. Suitable habitat for potential arthropod vectors was sparse at the site and in the immediate vicinity; the nearest good vector habitat is approximately 0.5 miles away near the Mississippi River. No ticks, horse flies, or deer flies were found at the residence, and only one adult mosquito was observed. The small yard contained numerous bird feeders, and the homeowners also spread birdseed on the ground to attract squirrels and chipmunks. Water for small mammals was provided in bowls on the ground. The homeowners reported that the rabbit population in their area was noticeably high during the previous spring. It is plausible that the artificial feeding of small mammals at the site facilitated the outbreak by enhancing direct and/or indirect contact between cottontails, rodents, and other wildlife.

The occurrence of tularemia in animals or humans is very rare in Minnesota. Human cases are identified only once every few years, and there have been no other identified

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outbreaks in wild mammals in Minnesota in recent memory. When sporadic cases do occur, isolates typically are *F. tularensis* Type B. Because the strain in this case, *F. tularensis* Type A, is more virulent, and because area physicians are not accustomed to considering tularemia as a possible diagnosis in patients, a health alert was sent to health care providers in the area informing them of the outbreak in animals, potential clinical manifestations of tularemia in humans, and diagnosis and treatment of tularemia. Fortunately, no human cases were identified. Area veterinarians also were alerted, but no cases were reported in domestic animals and no additional cases were known to occur in wild mammals. (Prepared by Dr. Kirk Smith and associates at the Minnesota Department of Health with assistance from personnel at the University of Minnesota Veterinary Diagnostic Laboratory)

Osteochondromas in Two Deer

During the past hunting season, SCWDS personnel diagnosed unusual bone tumors in two white-tailed deer from Mississippi and West Virginia. Each deer had an osteochondroma, a benign tumor of bone that usually develops on the skull or facial bones. The first of the two deer identified with this neoplasm was a 121-pound, 3.5-year-old doe harvested in Wilkinson County, Mississippi, and transported to Baton Rouge, Louisiana, for processing. The hunter was curious about a large tumor on the head of the deer and reported it to Louisiana Department of Wildlife and Fisheries personnel, who removed the head and submitted it to SCWDS. The immovable bony tumor measured 14 x 12 x 10-cm, projected from the forehead, was covered by haired skin, and seemed to blend with the bones of the skull (Fig. 1). The majority of the right nasal cavity was occluded by neoplastic bone that projected into it (Fig. 2).

The second deer was a thin, 3.5-year-old doe taken by a bow hunter in Randolph County, West Virginia. A 6 x 7 x 9-cm mass protruded from just behind and below the left eye. The deer was examined by personnel with the West Virginia Division of Natural Resources. When sectioned by a saw, the mass had the consistency of bone and blended with the back of the jaw bone. The inner surface of the skull was slightly deviated inward, apparently by pressure from the tumor. Formalin-fixed samples of the tumor were submitted to SCWDS for histopathology.

Microscopically, both masses were very similar and were consistent with a diagnosis of osteochondroma. These tumors are generally slow growing and usually don't have any significance to the animal unless they become large enough to affect sinus cavities, vision, or the ability to chew. This is a sporadic condition that apparently does not have any significance to the deer population. (Prepared by Kevin Keel.)

Figure 1

Figure 2

Invasive Exotic Animals in the Southeast

In September 2006, four Patagonian cavies were submitted to the SCWDS diagnostic service for necropsy. These animals were part of a free-ranging population illegally introduced into Brooks County, Georgia. According to the Georgia Department of Natural Resources (GA DNR), several cavies were being illegally kept by a landowner. Additionally, the owner reportedly released several of the animals into the wild for unknown reasons. The GA DNR captured, euthanized, and submitted these animals to SCWDS to assess them for disease threats to native wildlife.

Patagonian cavies are the second largest member of the order Rodentia and are surpassed in size only by capybaras. Interestingly, in 1993 SCWDS necropsied a capybara that was shot by a landowner in Laurens County, Georgia. No significant findings were noted in this animal at necropsy.

All members of the Caviidae family, which includes guinea pigs, are native to South America, generally have complex social behaviors, and are adapted for running. Cavies inhabit communal dens they construct or occupy dens created by other animals. They breed as monogamous pairs for life and females give birth to two or three young in the spring. Although these animals survive well in zoos and in captivity, the number of cavies is declining in their native habitat, partially due to competition from introduced hares.

Diagnostic examination of the cavies at SCWDS revealed one female was gravid with two fetuses. Additionally, two of the animals contained approximately 15 to 20 nematodes attached to the stomach mucosa. These nematodes were identified as *Graphidioides affinis*, which is a common helminth of cavies, but it does not naturally occur among North American wildlife. There are no other known hosts for this worm, but the potential effects of this parasite upon our native species have not been investigated. Serological testing disclosed three of the cavies had antibodies against *Leptospira interrogans* serovar *bratislava*, indicating exposure to the disease agent; however, there was no evidence of an active infection. Results of virus isolation attempts from tissues from all four cavies were negative.

Although foreign infectious agents were not detected in these cavies, the potential exists for disease introduction with importation and release of exotic species. A current example is the apparent introduction of poxvirus with gray squirrels imported from North America into the United Kingdom. Mortality due to infection of native European red squirrels with the exotic poxvirus is believed to be the cause of a dramatic decline in red squirrel populations. In addition to the threat of diseases, cavies and other exotic animals have the potential to hoard or destroy resources needed by native species and to interfere with native predator/prey interactions.

Several species of exotic vertebrates have become established in Florida. Since August 2003, SCWDS personnel have been trapping and examining wild animals in Florida for the presence of exotic ectoparasites (*SCWDS BRIEFS* Vol. 20, No. 3). Among the wild animals captured throughout Florida were several species of exotic animals, including 20 Gambian rats from the Florida Keys, a ball python from Lee County, green iguanas, a giant ameiva lizard, tropical house geckos, giant (cane) toads, and Cuban tree frogs.

In 2003, Gambian rats imported from Africa were involved in the North America monkeypox virus outbreak. The rats were identified as the source of monkeypox infection for pet prairie dogs, which in turn infected several prairie dog owners, family members, and health care workers. (*SCWDS BRIEFS* Vol. 19 No. 2). The Food and Drug Administration and the Centers for Disease Control and Prevention subsequently banned the sale, transport, and release of prairie dogs and six species of African rodents. The Gambian rats from Florida were not involved in the monkeypox outbreak, and testing of captured rats failed to detect antibodies against monkeypox and other

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orthopoxviruses. The Gambian rats have been found only on Grassy Key and Crawl Key, and efforts are underway to eliminate these rats from these areas.

Another exotic animal causing concern in Florida is the Burmese python, which was first reported in the Everglades in the 1980s. However, the magnitude of the problem became obvious after Hurricane Andrew hit South Florida in 1992 and caused large numbers of animal escapes. In September 2005, an Everglades biologist photographed the intertwined carcasses of a python and an alligator. In response to the publicity this picture created and the need for more regulation of exotic species, the Florida Fish and Wildlife Conservation Commission is considering new regulations requiring anyone owning non-native venomous reptiles and exotic "reptiles of concern" to have proper permits and meet certain enclosure standards. Additionally, owners would be required to have identification transponders implanted in these reptiles, particularly in snakes greater than two inches in diameter. (Prepared by Rick Gerhold and Britta Hanson)

New Field Manual Sales

This is a reminder that the revised Third Edition of the SCWDS *Field Manual of Wildlife Diseases in the Southeastern United States* has been delivered to the distributor and sales are underway. Considerable changes were made in the new edition, including addition of new topics, rearrangement of some sections, addition of selected readings for most topics, and deletion of some minor topics. The 448-page manual has are 138 pictures and illustrations, nearly all of which are in color. As with the former issues, the manual is printed on high-quality water-resistant paper, has a tough vinyl cover, and is the same convenient 4 3/4 x 7-inch size. This handbook is an important tool for wildlife biologists and others in recognizing the more common diseases and parasites of the major wildlife species in the Southeast. Also, because most species of wildlife found in the Southeast are indigenous to many other areas of the country, educators, students, veterinarians, farmers, and sportsmen everywhere can benefit from this ready source of information. The first edition of the Field Manual won the Outstanding Book Award from the Southeastern Section of the Wildlife Society in 1989, and this edition promises to be an even better product.

Sales are being handled by the American Association for Vocational Instructional Materials (AAVIM), a non-profit organization that deals exclusively with the development and distribution of career and academic instructional materials. Orders can be placed by mail, (AAVIM, 220 Smithonia Road, Winterville, GA 30683-9527), FAX (706-742-7005), or telephone (1-800-228-4689). Cost of the new manual will be $25, plus shipping and handling. Shipping rates are $4 for orders up to $50, 8% for orders of $51-$200 net, and 5% for orders of $201 or more net. Payment can be by VISA, MasterCard, check, money order, or purchase order. Georgia residents must add 7% sales tax. Foreign orders can be placed with AAVIM *proforma* invoices. AAVIM will calculate the cost of the order and shipping charges and return the invoice for payment. Payment must be made in U.S. funds payable through a U.S. Federal Reserve Bank. An order form is attached and can be photocopied and reused as needed, or copies may be downloaded from our website at www.SCWDS.org.

There are some copies of the 2nd edition of the manual left that we are offering at the bargain price of $10 each and they can be ordered using the same order form as the new edition. These would be a great buy for students on a limited budget. (Prepared by Gary Doster)

Information presented in this Newsletter is not intended for citation as scientific literature. Please contact the Southeastern Cooperative Wildlife Disease Study if citable information is needed.

Information on SCWDS and recent back issues of *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 on line, just send an email to Gary Doster (gdoster@vet.uga.edu) or Michael Yabsley (myabsley@uga.edu) and you will be informed each quarter when the latest issue is available.