

50 Years of Wildlife Disease Research

By John R. Fischer, Director, Southeastern Cooperative Wildlife Disease Study

July 1, 2007, marks the 50th anniversary of the Southeastern Cooperative Wildlife Disease Study (SCWDS) based at the University of Georgia's College of Veterinary Medicine.

Why should this interest people in Alabama? Because the Alabama Department of Conservation and Natural Resources supports SCWDS as a member of this unique regional cooperative and receives its assistance with wildlife mortality investigations, diagnostic testing, research, consultation, and training. This assistance is provided under the four primary SCWDS objectives:

- Detect causes of sickness and death in wildlife
- Define the impact of diseases and parasites on wildlife populations
- Delineate disease relationships between wildlife and domestic animals
- Determine the role of wildlife in the epidemiology of human diseases

X Marks the Beginning

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. 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 percent 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.

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. 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 public found this situation untenable and wanted action; however, it would be too costly for any single state to establish and maintain an organization with the expertise and capabilities to cope with future deer mortality crises.

After careful deliberation, a joint-state organization was 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 (SCDDS). 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 obtained through annual shares from each of the original 11 southeastern state wildlife management agencies members of the cooperative. Member states now number 17 and include Alabama, Arkansas, Florida, Georgia, Kansas, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Ohio, Puerto Rico, South Carolina, Tennessee, Virginia, and West Virginia.



A Southeastern Cooperative Wildlife Disease Study veterinarian (and graduate student) begins to examine three immature dead bald eagles that died with avian vacuolar myelinopathy.

Mission Expanded

Recognizing the increasing demands upon the newly created Deer Disease Study, in 1960 the SEAGFC expanded its mission to encompass all wildlife species and changed its name to the Southeastern Cooperative **Wildlife** Disease Study (SCWDS). In 1963, the United States Congress enacted a recurring annual appropriation to support basic wildlife disease research conducted by SCWDS. Through these means, efforts began to close information gaps about diseases in wild animals and clarify disease interactions between wildlife, domestic animals, and humans.

One of the first research projects designed to establish needed baseline health data was a parasite survey of deer throughout the Southeast from 1961-1963. Continued research into deer parasites yielded a management tool in 1980 that often is used to correlate deer parasite numbers with local deer nutritional status and population health in the Southeast. This technique, known as the abomasal parasite count (APC), involves determining the average number of stomach worms in a representative sample of deer from a particular population. The APC value, combined with other indicators of deer health, such as lung worm numbers and body fat abundance, can indicate whether the local deer population already has, or is likely to develop, health problems because the deer density is high and may exceed the carrying capacity of the habitat. With this and other biologic information, wildlife managers can determine whether the local deer population has health risks and adjust harvest regula-

tions accordingly. Over the years, SCWDS has performed nearly 700 deer herd health checks throughout the Southeast to assist wildlife biologists with deer population management.

Since the 1960s, SCWDS has conducted regional parasite surveys of numerous wild game bird species, including turkeys, quail, doves, and grouse, as well as small game animals, such as cottontails and squirrels. Many projects have been conducted to better understand the role of wildlife, particularly deer, in the epidemiology of diseases and parasites in livestock. All of these studies added significantly to the growing knowledge of diseases and parasites in wildlife, as well as potential health implications for domestic animals.

Continuing Study and Accomplishments

As knowledge expanded, it became apparent that native diseases and parasites were unlikely to devastate deer or other wildlife populations in the Southeast. Even Killer X, now known to be hemorrhagic disease (HD), did not significantly impact the Southeast's restoration programs as today's deer numbers readily attest. The onset of cold weather diminishes insect activity and accounts for the temporary disappearance of HD as autumn progresses.

Hemorrhagic disease remains a significant disease of white-tailed deer throughout much of the United States. SCWDS continues to conduct research to gain an even better understanding of this disease. For example, recent HD research by SCWDS has shown that the likelihood of deer

suffering severe clinical disease or dying, versus developing a mild or unapparent infection, depends on the geographic origin of the deer. In general, deer in the deeper portions of the South, such as Florida and Texas, are less likely to develop severe disease than deer to the north, particularly in the Midwest. This resistance in southern deer appears to be due to frequent exposure to the virus with maintenance of protective antibodies, as well as innate genetic resistance of the deer.

Since its inception, SCWDS has conducted diagnostic testing and research on animal diseases that are transmissible to humans. While examining wild animals that had been confiscated because they were being translocated illegally, SCWDS has detected foxes carrying a tapeworm that can be fatal to humans, but does not naturally occur in the Southeast, as well as rabid raccoons. Illegal translocation of raccoons in the 1970s is responsible for the expanding raccoon rabies outbreak that began in the Mid-Atlantic states, now affects the entire eastern United States, and threatens the Midwest. SCWDS also was heavily involved in research to develop and field test the methods to successfully deliver oral rabies vaccines to free-ranging wild animals.

Currently, SCWDS is conducting research into the ecology of avian influenza viruses in wild birds and the environment with the support and collaboration of the USDA, the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), and others. The first NIH-funded SCWDS project began in the 1990s for the investigation

of the role of deer in tick-borne human diseases known as ehrlichioses. Additional human-health oriented SCWDS projects have included Lyme disease and West Nile virus research, as well as surveys and experimental inoculations of deer with *E. coli* O157:H7, the bacterial organism first associated with undercooked ground beef that more recently sickened people who had consumed contaminated spinach. The frequent emergence of new diseases involving wildlife continues to provide opportunities for SCWDS to apply its unique expertise to develop prevention and control programs.

The Southeastern Cooperative Wildlife Disease Study has assembled an enviable list of accomplishments in its first 50 years. Many were attained without much public notice, while other SCWDS achievements have become well known. One of these is the CapChur™ gun that is used by wildlife biologists, veterinarians, and others around the world to tranquilize wild animals. Frank A. Hayes, the first SCWDS Director, was a key member of the Georgia team that developed, tested, and refined this essential management tool in the 1950s.


Many SCWDS achievements have been of great value to wildlife managers, researchers, educators, and policy makers, as well as domestic animal and public health officials. These include:

- Thousands of diagnostic investigations to determine causes of sickness or death in more than 200 wildlife species.
- Service as advisors to state and federal agencies and private organizations when wildlife health issues arise.
- Publication of two books, **Diseases and Parasites of White-tailed Deer** and the **Field Manual of Wildlife Diseases in the Southeastern United States**, now in its third edition.
- Publication of more than 450 scientific articles and book chapters comprising a significant amount of the wildlife health knowledge in North America.
- Distribution of a quarterly newsletter and brochures on hemorrhagic disease, feral swine diseases, Lyme disease, and other topics.

Today, SCWDS employs approximately 30 faculty, staff, and graduate students at

its headquarters. A satellite office operates in Florida where SCWDS has an ongoing surveillance project for exotic ticks and other external parasites that can serve as vectors of foreign animal diseases.

The SCWDS program has grown as demand for wildlife health information has increased, and the list of diseases involving wildlife, such as avian influenza, chronic wasting disease, Lyme disease, West Nile virus (WNV), and others has continued to expand. A small sample of ongoing SCWDS projects includes researching the cause and epidemiology of avian vacuolar myelinopathy (AVM), a fatal brain disease that has affected bald eagles, coots, ducks, geese, and other birds at several southeastern reservoirs since the early 1990s; mapping of the expanding distribution of feral swine throughout the United States; elucidating the role of wildlife in several significant tick- and insect-borne human diseases; and evaluating the efficiency of surveillance techniques for WNV.

Since its establishment in 1957 as the first regional diagnostic and research center specifically for wildlife diseases, SCWDS has provided untold benefits to natural resources, wildlife managers, domestic animal and public health officials, and citizens and visitors throughout the Southeast. With its unique cooperative approach and pooling of resources, SCWDS has grown and evolved by leveraging funds provided by an individual supporter with those of the other states, federal agencies, and granting organizations in order to develop and distribute wildlife health information and services of value to everyone. In this proven manner, SCWDS supporters, like the Alabama Division of Wildlife and Freshwater Fisheries and the people of Alabama receive more for their money and everyone gets a bargain. 

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Since 1957, the Southeastern Cooperative Wildlife Disease Study (SCWDS) has been providing services to Alabama. Examples of SCWDS activities benefiting Alabama include:

- Mortality investigations of a variety of mammalian and avian wildlife species.
- Immediate attention and timely response to urgent wildlife health issues when requested by wildlife managers.
- Deer population health evaluations on Wildlife Management Areas, National Wildlife Refuges, military bases, and other properties.
- Wildlife disease workshops for personnel of the Alabama Department of Conservation and Natural Resources.
- Consultation with policy makers regarding the health risks associated with captive wildlife, baiting of deer, and other artificial wildlife management activities.
- Long-term research of diseases and parasites of multiple species of wild animals and birds within Alabama and the Southeastern United States.
- Assistance to the Alabama Department of Public Health in monitoring eastern equine encephalitis virus activity among wild animals during an epizootic in horses.

