



SCWDS BRIEFS

A Quarterly Newsletter from the
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TB or Not TB: Michigan and Minnesota

In October 2011, the Minnesota Board of Animal Health (BOAH) announced that the USDA had restored its statewide bovine tuberculosis (TB) Accredited-free status. Regaining free status was the direct result of the aggressive TB eradication program that Minnesota implemented after detecting the disease in cattle herds and free-ranging white-tailed deer in 2005. In Michigan, where TB management has been less aggressive, the USDA recently granted TB Accredited-free status to 57 counties in the lower peninsula, leaving seven counties as Modified Accredited Advanced (MAA) and four counties (in which TB is endemic in wild deer) as Modified Accredited (MA). Management of TB in Michigan began after the disease was found in a deer in 1994.

Although there were some similarities, there also were many differences in Michigan and Minnesota regarding TB epidemiology; the approaches the two states have taken to eradicate the disease; the support that TB eradication efforts received from the public, landowners, and policy makers; and the progress the two states have made. Minnesota and Michigan first attained TB Accredited-free status in 1971 and 1979, respectively, and subsequently lost their free status under different but comparable situations.

In Michigan, TB was detected in a wild deer in 1975, but no follow-up occurred. It was regarded as an isolated spillover case, because TB had appeared transiently in wild deer on a handful of previous occasions. When TB was found in a wild deer again in 1994, things were different: Michigan was a TB-free state, so spillover from cattle was much less likely, and a culture of heavy supplemental feeding and baiting of wild deer in the area had artificially increased deer numbers and facilitated disease transmission via unnatural congregation of normally dispersed wild deer at feed sites. Follow-up surveillance in 1995 found 18 infected wild deer, and it was apparent that TB was being maintained for the first time in wild,

white-tailed deer in the U.S. By 1998, TB was confirmed in a cattle herd, and now has been detected in a total of 53 cattle herds and more than 700 wild deer. All TB organisms isolated from deer and cattle are of the same strain. By 2000, the USDA lowered Michigan's TB status to MA statewide. In 2004, Michigan was granted split-state status; 13 higher risk counties remained MA, while the rest of the state was upgraded to MAA.

Minnesota first discovered TB in a beef cattle herd in July 2005, and epidemiologic investigations identified four more infected herds in Roseau County by that fall. By November 2005, TB was detected in two wild whitetails. The USDA lowered Minnesota's TB status to MAA following the detection of TB in a fifth herd in 2006, and to MA in 2008 after TB had been found in eleven cattle herds and five wild deer, all in northwestern Minnesota. Minnesota was granted Split State Status in October 2008, allowing the state to focus its efforts in the MA zone. To date, TB has been confirmed in 12 cattle herds and 27 wild deer. All TB organisms isolated from deer and cattle were of one genetic strain of Mexican origin.

Losing Accredited-free TB status had serious implications for both states. The increased testing and movement requirements were costly and time consuming to cattle producers. Both states chose a similar plan to deal with the issue in wildlife, decreasing deer population density and reducing disease transmission opportunities by restricting deer baiting and/or feeding. But the disease dynamics and the differences in public support for TB eradication measures proved to be instrumental in managing the disease.

Bovine TB most likely was introduced to Michigan's wild deer by the cattle industry in the 1940-50s, when prevalence rates in some cattle herds in the northeastern portion of the Lower Peninsula were 20-30%. By the time it was found in 1994, TB had become well-established in wild deer in that area, and it was only a matter of time until transmission back to cattle occurred. One of

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the first measure the Michigan Department of Natural Resources took was to create Deer Management Unit 452 (DMU 452) at the center of the core outbreak area in order to focus their surveillance and management efforts.

The core outbreak area in Michigan is 1500km² with a deer density of ~20/km² in 1995. This high deer density and the congregation of deer at feeding and baiting sites facilitated TB maintenance within the population. Liberalized hunting regulations decreased the deer population density to ~10/ km² from 1995 to 2004. However, as hunters saw fewer deer their willingness to continue reducing deer numbers in DMU 452 waned, and the population density increased by 40% between 2004 and 2008. Feeding wild deer in affected areas in Michigan was restricted in 1998, and restrictions on baiting followed in 1999. However, compliance with baiting and feeding regulations in Michigan has been variable and often problematic.

Prior to the bans, baiting and feeding were conducted on a massive scale. Sugar beets, cull carrots, and other products were abundantly available across Michigan and could be purchased by the bushel, the truckload, or any volume in between. A culture of deer feeding and baiting and an industry to support it were firmly established. Consequently, there was substantial opposition to mandatory bans on baiting and feeding and poor public compliance. In fact, the annual number of arrests for non-compliance grew from 529 in 2002 to 701 in 2009. Individuals were willing to risk getting caught because enforcement was difficult and penalties were light.

Michigan's TB eradication efforts reduced TB prevalence in wild deer in the core outbreak area from 4.9% in 1995 to 1.2% by 2011; however, the prevalence has remained fairly static the last eight years. The public's waning willingness to assist in management efforts means that the eradication of TB from this wildlife reservoir will take decades, if it can be accomplished at all.

From the beginning, Minnesota had several advantages over Michigan in its fight against TB in wild deer, especially the benefit of learning from a decade of TB management in Michigan. Other factors favoring Minnesota's TB management program included a core outbreak area one third the size of Michigan's lower deer population density (2-3/ km²) and TB prevalence (~0.4%) in the core area, more recent spillover of TB from cattle (ca. 2003-2005), greater public ownership of land in the core area facilitating access to land in order to reduce deer numbers, more open habitat

in Minnesota's core area allowing greater opportunities to see and cull deer, and a statewide ban on deer baiting since 1991.

Minnesota enjoyed other advantages as its TB eradication efforts ensued, especially in the areas of leadership and public support. Governor Tim Pawlenty was directly involved and legislation was passed making additional funds available for TB eradication within a month of the loss of statewide TB-free status. Recreational deer feeding was banned in 2006 and compliance was excellent. Liberalized hunting regulations for the public and landowners reduced deer numbers in the affected area, and their efforts were supplemented by sharpshooters working from the ground and helicopters, resulting in a 55% decrease of the area's deer population. In April 2008, a voluntary cattle buyout process began and 69% of farms in the core area participated. Farms that did not sell out underwent risk assessments and were provided with funds to meet fencing requirements to decrease deer and cattle interactions.

All of this was accomplished with the support of area landowners, the public, and the governor. Factors behind this support likely include the greater value of agriculture to the state (MN ranks 7th nationwide in total value of agricultural product sales and 10th in cattle sales versus MI's rankings at 22nd and 28th) and the smaller economic value of deer hunting (MN hunters spent \$208 million in 2006 compared to MI hunters, who spent \$507 million). Greater political clout was with agriculture in Minnesota, while deer hunters held the upper hand in Michigan.

The differences in the results of TB management in Michigan and Minnesota are striking. The restoration of statewide TB Accredited-free status in Minnesota in October 2011 was possible because TB has not been detected in cattle since 2008 or wild deer since 2009. Surveillance for TB in Minnesota's wild deer will continue. In Michigan, TB continues to be found in cattle herds and wild deer at a low, but fairly constant rate in the area where the disease is endemic in deer. Although more than \$250 million has been spent fighting TB in Michigan to date, the lack of public support and political will, and the financial constraints caused by a severe recession jeopardize ongoing eradication efforts and threaten the successes that have been achieved so far.

More information on TB in Michigan and Minnesota can be found in *Vet. Microbiology* 151: 200-204. (Prepared by John Clark, UGA College of Veterinary Medicine, and John Fischer)

Continued Public Support for Hunting

A new study conducted on behalf of the National Shooting Sports Foundation (NSSF) found continued support for hunting, fishing, and shooting sports in the United States. The study was conducted by Responsive Management (RM), a firm that specializes in survey research on natural resources and outdoor recreation issues and has produced numerous interesting and useful reports over the years. Responsive Management interviewed 930 individuals over 18 years of age via a nationwide telephone survey and collected information on public participation in and attitudes towards hunting, fishing, and sport shooting.

Results showed 74% of respondents supported legal hunting (42% strongly approved), while 20% of respondents disapproved of the activity. These findings are comparable with previous studies from 2006 (77% in favor) and 1995 (73%). Although only 13% of respondents indicated that they had hunted within the past year, 95% agreed that it is fine for others to hunt when all regulations are observed. Interestingly, the study also reported that 42% of respondents had eaten wild game, including venison, wild turkey or duck, within the previous 12 months.

When it comes to fishing, 93% of respondents approve of legal recreational fishing, mirroring earlier approval ratings of 90-95% since 1995. Regarding shooting, 71% of survey respondents supported the rights of Americans to engage in legal, recreational shooting activities. Approval of legal shooting has remained fairly steady, while the number of Americans who regard shooting sports as inappropriate dropped from 11% in 2001 and 2006 to just 5% in 2011. (Prepared by Sarrah Kaye, Cornell University)

CWD Update: February 2012

There have been several developments regarding chronic wasting disease (CWD) since our last update. The discontinuation of federal funding for CWD-related surveillance and management activities in free-ranging and captive cervids is affecting everyone. From 2002-2011, the annual USDA-Animal and Plant Health Inspection Service (APHIS) budget for CWD included approximately \$15M. A large portion of these funds went to state wildlife management and animal health agencies via cooperative agreements. These funds were used for CWD surveillance and management, laboratory testing among wild and captive cervids, and for quarantine and indemnification of owners of captive cervid herds depopulated after CWD detection. The APHIS budget for Fiscal Year 2012

contains only \$1.8M for CWD with no funds available for cooperative agreements, and the President's proposed 2013 budget includes even less. States now bear the costs of all CWD-related work among wild and captive cervids.

Missouri recently became the 16th state to find CWD in its free-ranging deer herd. Two positive, adult bucks were among 1,077 tested in response to the 2010-11 detections of CWD in two captive deer facilities in Linn and Macon counties. Both positive wild animals were taken by hunters within two miles of the affected Macon County facility. Since 2002, the Missouri Department of Conservation (MDC) has tested more than 34,000 wild deer statewide and is testing additional free-ranging deer in the vicinity of the positive wild animals. MDC deer biologist Jason Sumners regards collecting additional samples as "...a first step and one of our best hopes for containing, and perhaps even eliminating, what we believe to be a recent localized event."

The Minnesota Department of Natural Resources (MN DNR) announced that testing more than 3,700 wild deer this fall and winter failed to reveal any additional positive animals in the southeastern portion of the state. In autumn of 2010, the MN DNR found one positive free-ranging whitetail within two miles of a facility that had held captive elk with CWD. Since finding CWD in a wild deer, the MN DNR is pursuing, for a minimum of three years, a management strategy that includes:

- Creation of a new CWD management zone.
- A ban on recreational deer feeding in the area (Minnesota banned baiting in 1991).
- Expanded hunting opportunities and liberalized bag limits to lower deer densities.
- Mandatory testing of deer older than one year taken in this area.
- A ban on carcass movement from the CWD zone without a negative test result.

In Minnesota, APHIS and state agencies have spent approximately \$1,960,000 to date in response to the detection of CWD in the captive elk herd and one wild deer. All future costs will be borne by the state in the absence of federal CWD funding. Both the MDC and the MN DNR appreciate and acknowledge the critical need for the cooperation and support of landowners and the public in their efforts to detect and manage CWD in their free-ranging deer herds.

Several significant research developments have been reported recently. The hypothesis that CWD may have originated from scrapie gained support from results of a study conducted at the USDA

National Animal Disease Center. White-tailed deer were inoculated intracerebrally (IC) or a natural route (orally and intranasally) with a scrapie isolate from the U.S. All deer inoculated IC had PrP^{Sc} accumulation and three deer necropsied after 20 months post-inoculation (MPI) had clinical signs, brain lesions, and widespread distribution of PrP^{Sc} in neural and lymphoid tissues. Similarities to CWD in the deer inoculated IC included an incubation period of 21-23 months, consistent clinical signs and distribution of PrP^{Sc} in tissues, and western blots of obex tissue that showed a molecular profile consistent with CWD and different from the inoculum. However, there were some differences in microscopic findings commonly seen with CWD and those in the IC-inoculated deer. All deer inoculated by the natural route were susceptible to scrapie, developed clinical signs, were necropsied 28-33 MPI, and had PrP^{Sc} in the brain and several lymphoid tissues. Two molecular patterns were found in the brains of deer inoculated by the natural route, but the pattern similar to the scrapie inoculum predominated, unlike in the deer inoculated IC. This work presents preliminary support for a link between scrapie and CWD, which may not only explain CWD's origin, but could possibly have implications for its management. Additional information on the IC inoculation study can be found in *Veterinary Research* 42: 107.

Red deer susceptibility to CWD via oral inoculation was demonstrated in a study conducted by collaborators from the U.S. and Canada. Red deer developed clinical signs and had spongiform changes in the brain when euthanatized at 20 MPI. The CWD prion was detectable in neural and lymphoid tissues, endocrine organs, cardiac muscle, nasal mucosa, and other tissues. Although field cases of CWD in red deer have not been reported, results of this study indicate that it could occur, which is not surprising given that elk and red deer are subspecies of *Cervus elaphus*. The results of this study can be found in the *Canadian Veterinary Journal* 51: 169-178. In addition, it was reported in May 2011 that natural cases of CWD were found in eight Sika deer (*Cervus nippon*) and five Sika/red deer crossbreeds during epidemiological investigations of CWD cases in captive elk in Korea.

Colorado State University researchers and their collaborators analyzed oropharyngeal, urogenital,

and gastrointestinal tissues of whitetails exposed to CWD in order to determine the origins of infectious CWD prions previously documented in saliva, urine, and feces. Using serial protein misfolding cyclic amplification, the researchers detected the highest PrP^{CWD} generating activity in the salivary gland, urinary bladder, and distal intestinal tract. The PrP-converting activity in these tissues ranged from extremely low to comparable with activity in the brain of the same animal; however, activity was not detected in the blood. Deer with the highest PrP^{CWD}-converting activity in the brain had higher and more widely disseminated prion amplification in excretory tissues. Although this study did not assess the infectivity of the prion-converting activity found in the excretory tissues, the results may help explain the efficient transmission of CWD that results in the high prevalence seen in some wild and captive cervid herds. The complete text of the study can be accessed in the *Journal of Virology* 85(13): 6309-6318. (Prepared by Sarrah Kaye, Cornell University, and John Fischer)

Lymphoproliferative Disease in Turkeys

A smart man once said, "For every one thing you miss by not knowing, you'll miss ten by not looking." Sometimes you have to dig a little to learn about what is going on in the world around us. So, when the Georgia Department of Natural Resources brought a wild turkey with a probable case of avian pox to us, we told them that we would be happy to take a close look at it.

Avian pox is one of those diseases that is rewarding to study. It makes diagnosticians look good, because it is common, has impressive lesions, and the causative virus is hardy and easy to culture. This turkey certainly seemed to fit the bill. It was an adult male and its head and neck were covered with dozens of nodules (Figure 1). Many of the nodules were ulcerated and covered with a crust. The eyelids also were covered with these proliferative masses and thick yellow fluid oozed from both eyes.

Unlike most turkeys with avian pox, this bird had lesions on the feet that looked very similar to those on the head. The second toe on the right foot was necrotic, and the end of the digit was missing (Figure 2). Avian pox lesions of the feet occur in some species, but turkeys usually have lesions on the head without involvement of the legs or feet.



The histopathology of avian pox is characterized by skin proliferation with unmistakable viral inclusions, and we were surprised when the skin sections of this bird did not contain typical lesions. Instead, the tissues were expanded by sheets of lymphocytes forming discrete masses that elevated the epidermis causing the gross appearance of pox. Furthermore, the viral cultures did not yield pox virus; lymphoproliferative disease virus (LPDV) grew instead. This has been a relatively recent finding at SCWDS where we identified the first case in 2009. Until that time, LPDV had not been reported in North America.

Lymphoproliferative disease previously was reported in domestic turkeys only in the United Kingdom and the Middle East. It was surprising to find it in the U.S., but we were even more surprised when we repeatedly identified it in clinically affected wild turkeys. The current case is the eighth LPDV-infected turkey we have seen at SCWDS in just two years.

Since our curiosity was piqued by the number of birds that were affected by this virus, we took a look at some apparently normal birds. In the last year, colleagues of ours in several states sent us samples from wild turkeys. We have processed only a portion of these samples so far, but PCR indicates that a number of closely related strains of LPDV are circulating in these birds. The probability

of an affected bird developing lesions and the potential impact on turkey populations are unknown. However, we are looking and we are trying to reduce the number of things we do *not* know about LPDV in turkeys. (Prepared by Kevin Keel)

H5N1 HPAI Virus Studies at SCWDS

Concern related to H5N1 highly pathogenic avian influenza (HPAI) virus, particularly in North America, has dwindled over the last few years. However, it remains a threat to human and animal health in regions of Eurasia and Africa where the virus is endemic. Additionally, the ability of the virus to evolve to transmit efficiently between humans or continue to spill-over into wild bird populations, remain possible as long as H5N1 HPAI viruses persist in these areas. Consequently, continued surveillance and research to monitor for changes in viral epidemiology, genetics, and biology are important to identify unique variants of H5N1 HPAI virus that warrant additional concern, preparedness, and response efforts.

From 1996 to 2005, H5N1 HPAI virus was predominately a pathogen of poultry in Southeast Asia with sporadic spillover into wild birds. During the spring of 2005, wild birds assumed a more significant role, when a large outbreak occurred in migratory waterbirds at Qinghai Lake in Northern China. Over 6,000 migratory waterbirds, including waterfowl, gulls, cranes, and cormorants, died in this outbreak, with bar-headed geese (*Anser indicus*) most severely affected. After the Qinghai Lake outbreak and through the spring of 2006, H5N1 HPAI virus spread westward, with outbreaks in domestic poultry and wild birds reported in Central Asia, Europe, Africa, and the Middle East.

The 2005-2006 incursion into Europe and Africa marked the first large-scale geographic spread of H5N1 HPAI virus outside of Southeast Asia and suggested migratory birds could contribute to the long-distant dissemination of virus. These factors justified the establishment of intense global wild bird surveillance efforts. Since 2006, sporadic outbreaks of H5N1 HPAI in wild birds have continued throughout Eurasia. Although some of these mortality events have involved large numbers of birds, the outbreaks have been localized, and no waves of viral dissemination, comparable to the 2005-2006 outbreaks, have been reported.

Since emerging in 1996, H5N1 HPAI viruses have evolved into numerous variants that differ antigenically and biologically. The World Health

Organization classification system groups H5N1 HPAI viruses into one of ten clades and multiple subclades based on similarity of the hemagglutinin (HA) gene. Historically, H5N1 HPAI viruses isolated from wild birds have predominately belonged to the subclade 2.2; however, over the last few years subclade 2.3.2 viruses have become the dominant strain in wild birds in some regions of Eurasia. This change in H5N1 HPAI epidemiology has raised questions relating to viral ecology in wild birds including:

- Do subclade 2.3.2 viruses differ biologically from subclade 2.2 viruses, particularly relating to host range and pathobiology?
- Are subclade 2.3.2 viruses replacing or co-circulating with subclade 2.2 viruses in Eurasian wild bird populations?
- What is the potential for these new strains to be maintained or geographically spread in migratory wild birds?

To provide basic insights into some of these questions, SCWDS, the USDA's Southeast Poultry Research Laboratory, and the Food & Agriculture Organization (FAO) of the United Nations completed a collaborative study to characterize the susceptibility, clinical signs, pathology, and patterns of viral shedding associated with subclade 2.3.2 H5N1 HPAI virus in bar-headed geese and ruddy shelducks (*Tadorna ferruginea*). These species were chosen because they have been involved repeatedly in H5N1 HPAI outbreaks caused by viruses belonging to the subclades 2.2 and 2.3.2.

Ruddy shelducks and bar-headed geese were inoculated with a subclade 2.3.2 H5N1 HPAI virus. Three of the four inoculated shelducks and all three geese became infected based on post-inoculation viral shedding and seroconversion. Three of the four shelducks exhibited severe neurologic signs between 4-5 days post-inoculation and died or were euthanized due to their condition. Clinical disease in shelducks was only apparent less than 24 hours prior to death. Gross and microscopic lesions in affected shelducks were consistent with subclade 2.2 H5N1 HPAI virus infection in susceptible waterfowl and included inflammation and necrosis in the brain, pancreas, heart, and pituitary gland.

Two of three inoculated bar-headed geese had mild transient weakness but recovered, and all three survived until the end of the trial. Microscopic lesions in the geese were less severe than in the shelducks and were largely restricted to

the brain. All infected birds of both species excreted moderate to high concentrations of virus via the oropharynx for multiple days. Viral shedding in feces was sporadic and at a lower concentration.

This study provided experimental data to better understand the pathobiology and viral shedding patterns associated with subclade 2.3.2 H5N1 HPAI virus in two susceptible wild bird species. Together with movement data provided by satellite telemetry on ruddy shelducks and bar-headed geese in Eurasia, our experimental data can be used to better understand the role of wild birds in the ecology of H5N1 HPAI virus and the potential risks that infected migratory birds may pose to wildlife, poultry, and human health. (Prepared by Justin Brown)

We Have Lost a Good Friend

Dr. Ernie E. Provost died on November 25, 2011, at age 90. He was born in Massachusetts in 1921. Even though he qualified for a deferment during World War II, Ernie joined the Marines, served in the Pacific Theatre, and received a Purple Heart and other honors. He earned a BS in zoology at Purdue University and his MS and PhD at Washington State University, while also working as a game warden for the State of Washington.

Ernie joined the University of Georgia (UGA) faculty in 1960 and taught for 31 years, in the Department of Zoology and the Warnell School of Forestry & Natural Resources (WSFNR). He will long be remembered for his unique teaching style and his commitment to students. Dr. Provost taught and trained thousands of students and was major professor for numerous MS and PhD recipients who include numerous individuals with a direct connection to SCWDS. Many went on to hold important professional and academic positions all over the country.

Ernie received several awards and recognition during his career, including a citation from the Georgia Department of Natural Resources for 30 years' service providing instruction to conservation rangers. He received the Outstanding Teaching Award from WSFNR and was the first recipient of the Crockford-Jenkins-Hayes Wildlife Conservation Award from The Georgia Wildlife Society. Ernie also was an avid skeet shooter and held numerous national and world championship trophies.

Dr. Forest Kellogg was Ernie Provost's first graduate student at UGA and received his MS in

forestry and wildlife in 1964. Forest was affiliated with SCWDS for many years before leaving to enter private business. After Ernie retired as Professor Emeritus, Forest collaborated with the Alumni Association to establish a scholarship fund in Ernie's name. This scholarship is for an undergraduate student in wildlife or fisheries with a demonstrated commitment to the management and wise use of forest resources. Forest's wish in establishing this scholarship was to provide the same quality education to future students that Dr. Provost provided to his students. Forest said that of the many things he learned from Ernie, one that has been particularly valuable to him over the years, has been "Be the task large or small, give it your best. Know that you can look back years later and be pleased with the thought expended and the result accomplished."

Dick Payne, who earned his MS under Ernie in 1968 and also is a past SCWDS employee, stated, "The wildlife profession lost a true pioneer and advocate with the passing of Dr. Provost. He possessed a rare combination of intelligence, integrity, and compassion. As an educator, he had no peer. As a mentor of students, he had no equal. As a human being, he was the finest example of his creator's work. Ernie was instrumental in the successful careers of countless students. We all need heroes in our lives, and Ernie was a true hero to many. Ernie Provost will be sorely missed and never forgotten. He cannot be replaced."

Dr. Syd Johnson, who taught alongside Ernie at WSNR from 1968 until Ernie retired, said, "It would be easier to write a book than a few lines about Dr. Provost, so I will limit my remarks to his teaching. Ernie had a passion for teaching, and in my many years at two universities I never knew anyone who matched his qualities as a teacher. His flawless, well-rehearsed lectures, spiked with humorous phrases and similes, were not easily forgotten. I never met a professor more loved and admired by students, but his gruff demeanor and insistence on perfection could strike dread in students at exam time. We'll not see his kind again."

Dr. Joe Meyers earned his MS in 1978 under Ernie's direction, and when Joe received his PhD in ecology in 1982 Ernie was chairman of his reading committee. At Ernie's death, Joe said, "I have lost an excellent teacher, mentor, and best friend. I considered Ernie a 'Super Uncle' who always took the time to help students who had the desire to work and had a thirst for knowledge. He was very patient as a teacher, although he came across as a tough taskmaster. Ernie was a

complete wildlifer and was interested in all wild animals and their habitats back when only game animals were considered wildlife by many. To students who worked hard, he gave excellent advice and complete control of their research assignment, including the budget. Ernie interacted well with world class scientists, students, and the common hard-working person. He is a major reason that the wildlife program at WSNR is what it is today - outstanding and growing in stature and student enrollment. I will do my best to honor and pass on what he has taught me in life."

Lonnie Williamson earned an MS degree in Wildlife Ecology under Ernie while working at SCWDS and went on to become Vice President of the Wildlife Management Institute, and Editor-at-Large for *Outdoor Life* magazine. Lonnie said, "Most people occasionally are blessed with good fortune. Among the most memorable of those times in my life is when Ernie Provost accepted me as his graduate student. As professor, mentor, and friend, he added the role of a wildlife ecologist to my journalistic pursuits. I had a rewarding career because of him. In retirement, I look back on Ernie as a great teacher. His superior in a classroom is unimaginable to me. He was a life-changer to me and many others."

Ernie was fond of quoting poets, philosophers, and intellectuals to make a point. One of his favorite maxims was an ancient proverb: "He who knows not and knows not that he knows not is a fool - avoid him. He who knows not and knows that he knows not is a student - teach him. He who knows and knows not that he knows is asleep - awaken him. He who knows and knows that he knows is a wise man - follow him."

A memorial service for Ernie was held on Sunday, December 4, 2011, at Flinchum's Phoenix, the lodge owned by WSNR at Whitehall Forest near Athens, Georgia. The family requests that anyone wishing to honor his memory can make a contribution to the "E. E. Provost Undergraduate Fisheries and Wildlife Scholarship," c/o Warnell School of Forestry & Natural Resources, University of Georgia, Athens, GA 30602-2152.

It was a pleasure to have known Ernie Provost for more than 45 years. He was a rare individual who impacted the lives of thousands of young men and women during his illustrious career at UGA. I tender my sincere condolences to his family and to Ernie's many friends around the world. (Prepared by Gary Doster)

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