REPORT OF THE COMMITTEE ON WILDLIFE DISEASES

Chair: Colin Gillin, OR

Vice Chair: Peregrine Wolff, NV

Charles Alex, VA; Wilbur Amand, PA; Neil Anderson, MT; Gary Anderson, KS; Paul Anderson, MN; Chelsea Anderson, NY; Joan Arnoldi, WI; Karen Beck, NC; Scott Bender, AZ; Warren Bluntzer, TX; Tom Bragg, NE; Rhonda Brakke, IA; Kristina Brunjes, GA; Dwight Bruno, NY; Beth Carlson, ND; Andres Castro, DC; Meredith Clancy, NY; Matt Cochran, TX; Walter Cook, TX; Joseph Corn, GA; Thomas DeLiberto, CO; Barbara Determan, IA; Mark Drew, ID; James Evermann, WA; John Fischer, GA; Richard French, NH; Francis Galey, WY; Tam Garland, TX; Donna Gatewood, IA; Robert Gerlach, AK; Paul Gibbs, FL; Samantha Gibbs, MD; Colin Gillin, OR; Linda Glaser, MN; Katherine Haman, BC; Greg Hawkins, TX; Kristi Henderson, IL; Terry Hensley, TX; Linda Hickam, MO; Robert Hilsenroth, FL; Donald Hoenig, ME; Dennis Hughes, NE; David Hunter, MT; Mandy Kauffman, WY; Kevin Keel, CA; Susan Keller, ND; Diane Kitchen, FL; Todd Landt, IA; Emily Lankau, GA; T.R Lansford, TX; Jim Logan, WY; Linda Logan, TX; Francine Lord, ON; Travis Lowe, KS; Mary Luedeker, TX; Margie Lyness, GA; David Marshall, NC; Chuck Massengill, MO; Tracy McCracken, MD; Leslie McFarlane, UT; Daniel Mead, GA; Robert Meyer, WY; Eric Mohlman, NE; Yvonne Nadler, IL; Julie Napier, NE; Mitchell Palmer, IA; William Parker, GA; William Pittenger, MO; Jewell Plumley, WV; Kate Purple, TN; Jennifer Ramsey, MT; Justin Roach, OK; Mark Ruder, KS; Emi Saito, OR; Shawn Schafer, OH; Stephen Schmitt, MI; David Schmitt, IA; Dennis Schmitt, MO; Brant Schumaker, WY; Andy Schwartz, TX; Charly Seale, TX; Laurie Seale, WI; Daryl Simon, MN; Jonathan Sleeman, WI; David Stallknecht, GA; Brian Standafer, MN; Cleve Tedford, TN; Robert Temple, OH; Charles Thoen, IA; Lee Ann Thomas, MD; Brad Thurston, IN; Curt Waldvogel, OH; Michele Walsh, ME; Skip West, OK; Diana Whipple, IA; Ellen Wiedner, FL; Margaret Wild, CO; Richard Willer, HI; Ellen Mary Wilson, NM; William Wilson, KS; David Winters, TX; Richard Winters, Jr., TX; Cindy Wolf, MN; Peregrine Wolff, NV; Mary Wood, WY; Marty Zaluski, MT; Glen Zebarth, MN.

The Committee met on October 19, 2014 at the Sheraton Hotel in Kansas City, Missouri, from 12:30 – 5:00 PM. There were 36 members and 31 guests present. The meeting was called to order at 1235 PM by Chair Gillin. USAHA committee information was presented to members including sign-in procedures and documentation of membership status and voting rules. The Chair briefly discussed discussion rules and use of Robert's Rules of order. There were no resolutions or recommendations submitted by this committee in 2013.

Committee members discussed and voted unanimously to strike the word "accidental" from the current mission statement. The motion was made by John Fischer and seconded by Dick Winters.

The purpose of the Committee on Wildlife Diseases is to promote an understanding of the importance of diseases to free-ranging wildlife, commercial captive wildlife and domestic animals and the interactions these groups of animals and diseases have; to protect the integrity of native free-ranging wildlife populations while simultaneously protecting native free-ranging wildlife, commercial captive wildlife, and domestic animals of the United States from diseases they may share or which may be transmitted among them; to protect free-ranging wildlife of the United States from ~~**accidenta**~~**l** introduction of diseases; to assist in the identification and management of disease problems of free-ranging and commercial captive wildlife; and to promote sound wildlife disease management practices among responsible agencies and industries.

Presentations & Reports

There were 12 presentations in this year's committee focused on the interface between wildlife and livestock health. These talks were given by state, federal, and university presenters from management and research disciplines. Topics included case descriptions of emerging diseases, disease spillover between livestock and wildlife, cutting edge technologies, presentations of federal regulatory programs, and discussions of epidemiological trace-outs of complex disease cases and outbreaks. The following is an agenda summary of presentations given during the 2014 committee on Wildlife Diseases:

USAHA Wildlife Student Scholarship Presentation – ***Betsy Elsmo***
Mountain Goats at the Wildlife – Livestock Interface - ***Peregrine Wolff***
Results of the *Mycoplasma ovipneumonia* ring test (testing the laboratories) – ***Mark Drew***
Epizootic Pneumonia in Bighorn Sheep: An Update – ***Peregrine Wolff***
Meningeal worm – the interface between the swamp and the fence – ***Mark Drew***
Treponeme-associated Bacterial Hoof Disease in Wild Elk in SW Washington– ***Kristin Mansfield***
Volatile Organic Compound sampling in wildlife/livestock for Bovine TB and Brucella – ***Jack Rhyan***
Hemorrhagic disease update 2014 – ***Daniel Mead***
Brucellosis surveillance and management in Montana elk populations– ***Neil Anderson***
Epidemiology of Recent Chronic Wasting Disease Cases in Pennsylvania – ***Craig Shultz***
Epidemiology of Recent Chronic Wasting Disease Cases in Iowa – ***David Schmitt***
USDA-APHIS-VS CWD Program Standards and Updates – ***Patrice Klein***

The first presentation given was by the USAHA Student Travel Scholarship award winner, Dr. Betsy Elsmo. This travel scholarship is given to students of allied organizations through a competitive selection. The American Association of Wildlife Veterinarians was asked to canvas their membership for students interested in the attending USAHA and the current issues of wildlife disease related to the livestock and agriculture. Dr. Elsmo discussed her background and several research projects she has authored including Acute, necrotizing, hemorrhagic, interstitial pneumonia and suppurative myocarditis associated with *Bartonella henselae* in a Florida panther (*Puma concolor coryi*) and a review of dermatologic diseases in wild turkeys(*Meleagris gallopavo*) in the eastern U.S. 1975-2013.

Mountain Goats (*Oreamnos americanum*) at the Livestock – Wildlife interface: A Susceptible Species

Peregrine L. Wolff, Nevada Department of Wildlife, 1100 Valley Road, Reno, NV 89509, USA
Thomas E. Besser, Wash. State University, Veterinary Diagnostic Laboratory, Pullman, WA 99164, USA
Danielle D. Nelson, Wash. State University, Veterinary Diagnostic Laboratory, Pullman, WA 99164, USA
Julia F. Ridpath, Ruminant Diseases and Immunology Research Unit, National Animal Disease Center, USDA Agricultural Research Service, 1920 Dayton Avenue, PO Box 70, Ames, IA 50010, USA
Kathryn McMullen, , Ruminant Diseases and Immunology Research Unit, National Animal Disease Center, USDA Agricultural Research Service, 1920 Dayton Avenue, PO Box 70, Ames, IA 50010, USA
Juan Muñoz-Gutiérrez, Washington State University, Veterinary Diagnostic Laboratory, Pullman, WA 99164, USA
Mike Cox, Nevada Department of Wildlife, 1100 Valley Road, Reno, NV 89509, USA
Chris Morris, Nevada Department of Wildlife, 1100 Valley Road, Reno, NV 89509, USA
Caleb McAdoo, Nevada Department of Wildlife, 1100 Valley Road, Reno, NV 89509, USA

Mountain goats (*Oreamnos americanum*) were first introduced into the East Humboldt and Ruby Mountains of Elko County, Nevada in the 1960's. These contiguous mountain ranges are also home to other ruminant species (native mule deer and introduced Rocky Mountain bighorn sheep) and are surrounded by both public and private rangelands utilized for domestic cattle, sheep, and goats. Permitted as well as stray domestics have been documented between 9,000 and 10,000 feet which are well within utilized habitat of the mountain goats. Since 2010, we have documented infection by *Mycoplasma ovipneumoniae* in adult (n=13) and kid (n=1) mountain goats. Nasal (i.e., all animals) and lung (i.e., kid) swabs from these animals were used to identify M *ovipneumoniae* by RT-PCR following broth enrichment. In addition to bronchointerstitial pneumonia, the kid had suppurative and hemorrhagic enteritis with lymphoid necrosis. Type 1a BVD virus was isolated from the kid's spleen. A female adult goat was presented with ulcerative cheilitis and pseudocowpox virus was identified in this lesion by PCR and sequencing. These disease surveillance data suggest that interactions resulting in disease transmission occur between mountain goats and domestic ruminants and should be discouraged as part of a comprehensive management program for this species.

Results of the Mycoplasma Ovipneumoniae Ring Test (Testing the Laboratories)

Mark L. Drew, Idaho Department of Fish and Game, Wildlife Health Laboratory, Caldwell, Idaho.
Tricia Hebdon, Idaho Department of Fish and Game, Wildlife Health Laboratory, Caldwell, Idaho.
Daniel P. Walsh, National Wildlife Health Center, United States Geological Survey, Madison, Wisconsin.
Thomas Besser, Veterinary Microbiology and Pathology, College of Veterinary Medicine, Washington State University, Pullman, Washington.
Frances Cassirer, Idaho Department of Fish and Game, Lewiston, Idaho.

Abstract: A ring test was conducted to compare the consistency of results for detection of Mycoplasma ovipneumoniae using PCR in a standardized sample set. Five laboratories that routinely test samples for Mycoplasma spp. participated. Four of these labs provided 4 source samples consisting of both M. ovipneumoniae-positive and -negative samples isolated from bighorn sheep (Ovis canadensis). A total of 21 test samples were prepared as 250 µl aliquots of selected source samples, and distributed as replicate, blinded samples to each laboratory. Using either standard or real time PCR test, high agreement was found within and between labs for most samples including the replicated source samples. Results of only 2 of 85 (17 samples run by 5 labs) differed between laboratories. However for 2 source samples (4 test samples/lab) containing very low levels of specific DNA template there was some variation in results within and between labs. All participating labs felt the ring test was successful, and based on the results of the ring test some labs made changes to improve their PCR protocols. The ring test provided a review of current methods for PCR detection of Mycoplasma ovipneumoniae and showed consistency of results between the participating laboratories, both of which will benefit bighorn sheep disease diagnostic efforts.

Acknowledgements: The authors wish to acknowledge the assistance and collaboration of the following individuals:

Funding was provided by the Idaho Wildlife Disease Research Oversight Committee (IDWROC).
David Blehert, Michael Bonds, and Kristina Egstad, National Wildlife Health Center, United States Geological Survey, Madison, Wisconsin
Participating laboratories:
Dr. Thomas Besser, Veterinary Microbiology and Pathology, College of Veterinary Medicine, Washington State University
Dan Bradway, Washington Animal Disease Diagnostic Laboratory
Dr. Daniel Brown, College of Veterinary Medicine, University of Florida
Hank Edwards, Wyoming Game and Fish Department, Laramie, Wyoming
Dr. Glen Weiser, Caine Veterinary Teaching Center, University of Idaho, Caldwell, Idaho

Update on Pneumonia Complex in Bighorn Sheep

Peregrine Wolff, Nevada Department of Wildlife

This review will address what is new in 2014 for the following topics concerning bighorn sheep pneumonia and bighorn sheep / domestic sheep interactions; collaboration with the domestic sheep industry, policy, research, and publications.

Summary Report: Bighorn Sheep Respiratory Pathogen Sampling And Health Assessment Workshop

In September of 2013, a bighorn sheep disease sampling/health assessment workshop was conducted at the request of the Western Association of Fish and Wildlife Agencies, Wildlife Health Committee (WAFWA WHC) to prioritize and standardize testing protocols for respiratory pathogens of bighorn sheep. Specific concerns included that numerous tests for a variety of pathogens are available but interpretation of results is challenging, laboratories do not have standard methodology and the 2009 WAFWA WHC Sheep Sampling Guidelines required updating.

The workshop included wildlife health professionals from nine Western state wildlife agencies and two Canadian provinces. WAFWA Wild Sheep Working Group members were surveyed prior to the workshop. Funding was secured from the Wild Sheep Foundation to support attendees with travel restrictions.

The group produced documents: 1) outlining sampling protocols for various herd management goals, 2) listing important terms and their concise definitions, 3) standardizing necropsy protocols, 4) providing a concise article on herd health monitoring recommendations. Also identified were several tests/protocols requiring future research as well as topics/techniques for agency staff training to support consistent approaches to sample collection and handling. These products will support recommendations across agencies for different management practices and provide a valuable resource and reference for all wildlife health and management professionals.

Research:

Vaccination

Dr. Srikumarin, Washington State University, has been working on developing two approaches to prevent infection of bighorn sheep with Mannheimia hemolytica. The first approach involves utilizing leukotoxin negative Bibersteinia trehalosi to potentially inhibit the growth of leukotoxin (Lkt) positive M. hemolytica in the oropharynx of domestic sheep, thus eliminating the transfer of lkt positive M. hemolytica to bighorn sheep. The second approach involves the use f a mutant form of a virus which would contain fragments of leukotoxin positive M. haemolytica. The properties of the mutant virus are such that it reactivates under stress which would in essence provide a booster effect thus allowing animals develop adequate lifelong immunity with a single dose of the vaccine.

The Role Of “Super Shedders” In The Persistance Of Disease In Bighorn Sheep

Idaho department of Fish and Game, Washington State University and South Dakota State University are collaborating to investigate whether respiratory disease persists within bighorn sheep populations through the infection of a relatively small number of chronic or “super shedders” of Mycoplasma ovipneumoniae that are responsible for driving disease transmission. Captive pen studies of ewe/lamb groups will test whether ewes that are identified as persistent shedders will have different rates of lamb survival vs. ewes that are classified as non-shedders of M. ovipneumoniae.

Respiratory Disease Surveillance In Bighorn Sheep: Linking Pathogens And Herd Health

Wyoming, Colorado and Montana are conducting a joint research project to better understand the distribution and pathogenicity of the respiratory pathogens that are recovered during pneumonia die-off events in bighorn sheep, specifically investigating if there is a link between pathogen presence and herd health. The group is two years into a three year study, and has sampled 187 bighorn sheep from ten herds in Wyoming. Blood, feces, and swabs (tonsil, nasal and ears) were collected. Future research will include similar analysis from bighorn sheep herds in Colorado and Montana.

Bighorn Sheep Sinus Tumors Are Associated With Co-Infections By Potentially-Pathogenic Bacteria In The Upper Respiratory Tract

A collaborative project between Colorado and Wyoming to study whether or not the presence of sinus tumor features (tumor score) affected the likelihood of detecting potentially-pathogenic bacteria from upper respiratory sinus lining tissues in bighorn sheep. A PCR assay for the detection of leukotoxigenic Pasteurellaceae bacteria as well as a PCR for the detection of Mycoplasma ovipneumoniae were used, to screen sinus lining tissues from bighorn sheep for the presence of these potentially-pathogenic bacteria. The presence of sinus tumors may present a possible mechanism for maintenance and shedding of bacterial agents from the upper respiratory tracts of bighorn sheep.

Publications:
A number of publications have been published in that addresses bighorn sheep pneumonia. These publications are available on the University of California (Davis) Wildlife Health Center website dedicated to Wild and Domestic Sheep Disease.
(http://www.mwvcrc.org/content/view/122/102)

Meningeal Worm – The Interface between the Swamp and the Fence

Mark L. Drew, Idaho Department of Fish and Game, Wildlife Health Laboratory, Caldwell, Idaho

The meningeal worm, *Parelaostronglylus tenuis*, is a nematode parasite of the meninges of white-tailed deer (*Odocoileus virginianus*). The parasite causes mortality in most other species of cervid and bovid that it infects, largely with the exception of cattle and sheep. The parasite is transmitted by a variety of terrestrial snails and slugs and in the natural host (white-tailed deer) the larvae migrate within the dorsal horns of the spinal cord cranially to the meninges without producing clinical signs. In other species of ungulates, *P. tenuis* larvae migrate through the spinal cord and can end up in various locations within the brain. The aberrant migration pattern leads to the severe clinical signs prior to death which can include muscle weakness, circling, incoordination, head tilt, inability to rise and thrashing.

Many surveys for meningeal worm have been done in the past both to outline the distribution of the parasite and to develop risk assessments for the possible introduction of the parasite in locations where it is not known to exist. In general, the distribution of the parasite, based on fecal surveys for dorsal-spined larvae in fecal samples or dissection of heads to find adult parasites in white-tailed deer, is the eastern portion of North America, with the western boundary at or near the 100th meridian. Many locations west of the boundary have appropriate species of snails or slugs and white-tailed deer for the parasite to exist, but the parasite is not present presumably due to environmental conditions. However, most areas west of the present distribution of the parasite also have numerous species of wild ungulates that would likely experience negative population level consequences if the parasite was introduced.

The widespread captive cervid industry, currently enumerates xxxx wtd, elk, fallow …. The natural host of the parasite, the white-tailed deer, is one of the most common species of domestic cervids in North America and numbers of captive white-tailed deer are increasing in many states. It is also known that some elk (*Cervus elaphus*) that are infected with P. tenuis can tolerate the infection and even produce larval worms which can transmit the infection to other animals.

Many states in the west, including Idaho, prohibit the importation of domestic or captive cervids from east of the 100th meridian. The primary basis for the prohibition is the presence of susceptible cervid and bovid hosts and the appropriate intermediate hosts. If the parasite were introduced, control of the parasite would be very difficult as the intermediate hosts are difficult to control in the environment and there is no good treatment for affected individuals.

Introduction
Parelaphostrongylus tenuis is a metastrongylid parasite of white-tailed deer (*Odocoileus virginianus*) (Anderson, 2000; Lankester, 2001). The intermediate hosts are terrestrial slugs and snails.
Numerous cervids including moose (*Alces alces*) and elk (*Cervus canadensis*) as well as domestic ungulates including sheep, horses, cattle, llamas and alpacas can all be affected by *P. tenuis* (Lankester 2001; Gerhold et al., 2010; Tanabe et al., 2010; Mitchell et al., 2011). Currently, *P. tenuis* infection is diagnosed using by post-mortem examination of brain or spinal cord sections. This technique has variable to low sensitivity and often animals are diagnosed as *P. tenuis* suspects. The construction of a live animal test would be a significant and sensitive diagnostic, research, and surveillance tool. In addition it would allow for detection of subclinically infected animals which would assist with understanding the epidemiology of the disease. Additionally the test would be useful to determine the western extent of *P. tenuis* distribution. Although the historic distribution of *P. tenuis* extended to the 100th meridian (Lankester, 2001), recent anecdotal evidence suggests that *P. tenuis* has extended beyond its historical range.

Deer farming is one of the fastest growing industries in rural America, and it is a great alternative agricultural pursuit for families. Compared to traditional livestock, the deer industry is booming. It generates $3 billion for the U.S. economy and supports tens of thousands of jobs in communities across the country. In fact, a Texas A&M study reports deer farming as one of the fastest growing industries in rural America (NADFA 2014) 250,000 animals NADFA 2014 white tailed deer, fallow deer, sika deer, reindeer . numbers of elk farms and farmed elk total 800 farms and 35,000 elk in Canada, and 1,200 farms and 70,000 elk in the United States 150-160,000 farmed elk in N AM

Association between *Treponema* spp. and Severe Hoof Disease in Elk from Washington State, USA

Kristin G. Mansfield[1,4], Nicholas J. Evans, and Sushan Han[3]
[1]Washington Department of Fish and Wildlife, Spokane Valley, Washington, USA; [2]Department of Infection Biology, Institute of Infection and Global Health, University of Liverpool, Liverpool, UK; [3]Diagnostic Medicine Center, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, Colorado, USA; [4]Email: kristin.mansfield@dfw.wa.gov

Reports of elk (*Cervus elaphus*) with lameness and severely deformed or missing hooves increased dramatically in southwest Washington state during the late winter and early spring of 2008. The geographic distribution of reports of the disease has continued to expand since then, and at this time is estimated to encompass a core area of approximately 10,500 km^2 (4,000 mi^2). A diagnostic investigation to determine the cause was initiated in 2009. Radiography, bacteriology, virology, serology, and trace mineral analysis failed to reveal a cause of the disease. Histopathology and silver staining of lesions from affected hooves demonstrated the presence of deeply invasive spirochetes accompanied by significant inflammation. Furthermore, *Treponema phagedenis*-like and *Treponema medium*-like spirochetes were isolated from diseased elk hooves. These isolated *Treponema* represent two of the three phylotypes known to be highly associated with hoof diseases in domestic animals: bovine digital dermatitis in cattle and contagious ovine digital dermatitis in sheep. Based on findings to date, it appears that *Treponema* spp. may have a causal role in the emergence of a significant disease of free-ranging elk in the Pacific Northwest of North America.

Research Update on VOC Sampling in Wildlife & Livestock for Bovine TB and Brucella

Jack Rhyan & Pauline Nol; Wildlife/Livestock Disease Investigations Team; U.S. Department of Agriculture; Animal and Plant Health Inspection Service, Veterinary Services

Analysis of volatile organic compounds from breath of animals is being tested as a screening tool for brucellosis and bovine tuberculosis. In two studies of *Mycobacterium bovis* naturally- and experimentally-infected animals, analyses of breath VOCs by gas chromatography/mass spectrophotometry and by an electronic nose showed different patterns of VOCs in breath of infected and non-infected cattle. In two studies of Brucella seropositive and seronegative Yellowstone bison, different patterns of VOCs were detected between seropositive and negative animals by GC/MS and the electronic nose. Results of these studiessuggests the need for continued evaluation of this emerging technology.

SCWDS Hemorrhagic Disease and Culicoides Survey Updates: 2014

Daniel Mead, Joseph Corn, David Stallknecht, and Stacey Vigil

Dr. Daniel Mead presented the Southeaster Cooperative Wildlife Disease Study hemorrhagic disease report as well as an update on the SCWDS *Culicoides* survey. SCWDS has received samples (mostly WTD) from 13 states for HD testing. EHDV-2 has been detected in samples submitted from GA, LA, and OR. EHDV-6 has been detected in samples submitted from FL and NC. BTV-17 was detected in NJ.

SCWDS has been conducting surveys to determine what *Culicoides* spp. are present in the SE since 2007. Since 2007 they have collected at 307 sites and have collected over 227,196 biting midges. Dr. Mead provided a list of species that were found outside of their previously recorded ranges.

Brucellosis Surveillance and Management in Montana Elk Populations

Neil Anderson[1], Kelly Proffitt[1], Quentin Kujala[2], Julee Shamhart[3], Jennifer Ramsey[1], Keri Carson[1], Jenny Jones[1], Justin Gude[2 1] Montana Fish, Wildlife & Parks, Bozeman, MT; [2]Montana Fish, Wildlife and Parks, Helena, MT: [3]Montana Fish, Wildlife and Parks, Missoula MT

Montana Fish, Wildlife and Parks (MFWP) initiated a targeted surveillance project for brucellosis in elk in the winter of 2010/2011. Targeted surveillance focused on wintering elk herds in areas adjacent to the known distribution of brucellosis in Montana's elk populations. Surveillance efforts detected brucellosis in three areas where brucellosis had not been known to exist, resulting in the expansion of the geographical distribution of the disease in elk populations. Where detected, seroprevalence in elk ranged from approximately 5% - 23%. These findings also led to the expansion of the Designated Surveillance Areas (DSA) for brucellosis in livestock. The cause of the expansion may likely be due to several factors including: increased surveillance efforts, changing elk distributions and expansion of the disease into new population segments. Surveillance in two areas, the Pioneer Mountains and the Tobacco Root Mountains, failed to detect brucellosis, increasing confidence that these elk populations pose little risk for transmitting brucellosis to livestock.

MFWP, through a citizens working group, developed guidelines for managing elk populations within the DSA. The fundamental objectives of the guidelines consist of: 1) minimize transmission of brucellosis from elk to livestock, 2) maximize acceptance of management actions by major stakeholders, and 3) maximize cost effectiveness. Management efforts focus on elk distributions within the DSA and maintaining separation between elk and livestock during the brucellosis risk period from January thru June. The tools available for managing elk distributions include hazing elk, limited hunting seasons, limited fencing of small areas (hay stacks and feed lines), and continued research and education. The guidelines also call for the establishment of local working groups to address elk/cattle distribution issues. All management plans are subject to the public process and MFWP Commission approval. A lawsuit has been filed seeking an injunction for actions proposed by one local working group and tentatively approved by the MFWP Commission.

Chronic Wasting Disease in Pennsylvania Captive Cervids Current Status

Craig Scultz, State Veterinarian, Pennsylvania Department of Agriculture

Cervid Farming In Pennsylvania

Captive cervid operations became regulated by the Pennsylvania Department of Agriculture (PDA) in 2005. They were previously regulated by the Pennsylvania Game Commission. The cervid industry exhibited expansion under PDA and peaked in 2009 at nearly 1500 herds – over half certified herds.

Cervid Regulation in Pennsylvania

Orders of General Quarantine - Provide for a nimble regulatory response to animal disease threats – classified as dangerous transmissible diseases (DTD) under Pennsylvania's Domestic Animal Law. CWD was designated as DTD in 2006.The First Order of General Quaranti To address new disease control procedures a Revised Quarantine Order was put in place in 2014 to meet Federal HCP Standards and address CWD positives in a five year fully certified herd in 2012.

History of Pennsylvania CWD Positives

October 2012 – A small (10 head) Certified Herd in New Oxford, PA (Adams County) submitted routine mortality reports. A "thin" lactating white tailed doe with no other clinical signs was observed and tested positive for CWD. Depopulation yielded second positive – a young male. The facility

proved to have some compliance-challenges in their HCP operation with marginal recordkeeping. A positive trace-back exposed herd in Lycoming County (North Central PA) according to records was the birth herd of infected animal. The positive doe left this herd as a fawn and was considered a relatively low risk situation. Following discovery, there were subsequent numerous trace forward exposed herds. Subsequent DNA testing demonstrated no link between the positive Adams County doe and the purported Lycoming County birth herd. All additional test results of cervids in trace back/forward exposed herds were "not detected".

PA CWD Response Plan

A CWD Interagency Task Force was convened and included key members of the Pennsylvania Department of Agriculture, Pennsylvania Game Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Department of Health, USDA, APHIS, and additional members from academia and Agricultural Extension

Disease Management Areas

The number of captive cervids tested at Pennsylvania Veterinary Laboratory inculed:

2008 - 2,448
2009 - 2,347
2010 - 2,518
2011 - 3,133
2012 - 2,307
2013 - 2,197
Since 2002 – 21,335

Free Ranging Cervids Tested by the Pennsylvania Game Commission during the 2012-2013 Hunting Season included 2,088 from Adams/York Disease Management Area 2 with an additional 2,945 tested statewide. Also, 3 South-Central Positives were discovered in Blair and Bedford Counties from Hunter Harvest surveillance. Two additional road kill surveillance positives were found in DMA 2 confirmed in 2013

During the 2013-2014 Hunting Season, 738 from Adams/York Disease Management Area were tested, 1060 from Blair Bedford Disease Management Area, 3322 from elsewhere in the state, with1 additional road kill surveillance positive from DMA 2 confirmed in 2014. Since 1998 – Over 48,000 free-ranging deer have been tested.

CWD Program Participants in Pennsylvania

Approximately 1200 Farms

HCP /HMP – 602/367	May 2014
HCP/HMP – 466/650	October 2014

Ratio is changing with enrollment in new programs.

CWD in PA Captive Certified Herds

A total of nine white-tailed deer in two, five-year fully certified herds have tested CWD positive. Recently a 10th positive deer was found in a new herd in DMA 3. Disease transmission was confirmed in two herds. Recordkeeping gaps in the index Adams County herd prevented successful trace of the index positive animal to the premises of origin. DNA did not confirm herd of origin as indicated in participant's records. The Jefferson County herd was a small herd assembled through purchase of fully certified deer. There was excellent recordkeeping and program compliance in all implicated herds including positive and trace-back exposed herds. Trace-back exposed herds however, showed high animal movement/turnover.

CWD in PA Certified Herds

Jefferson County herd – small herd (15-20 total inventory) assembled in 2012-2013 through purchase of fully certified WTD from 5 year fully certified source herds. CWD positive animal identified through routine surveillance sample that tested positive in April 2014.

Second surveillance sample subsequently tested positive. And the herd was depopulated in July 2014 yielding five additional CWD positives totaling 7 positives out of 17 adult animals.

Benefits to Disease Research

Through efforts of the captive cervid industry live animal samples were collected from the quarantined positive herd prior to depopulation. Collected tissues included Whole Blood, Rectal Tissue, and Nasal Brushings. Post mortem samples (eyes, blood, rectal tissue) were collected at Pennsylvania Veterinary Laboratory after depopulation at time of CWD sample collection.

Trace-back-Exposed Herds -Risk Considerations

1. Herd Disease Surveillance through Mortality Testing. Risk considerations include missed/poor quality/untestable samples and animals sold to herds with unknown previous testing status where results are not obtainable.

2. Animal Movements into the Herd. Risk considerations include animals associated with CWD positive herd in the past; CWD in free-ranging cervid population; and proximity to CWD infected herd.

Other High Risk Activities Associated with Captive operation includeTaxidermy, Handling of high risk materials from hunts, Rehabilitation, and Fawn rearing

Exposed Deer - Risk Considerations in Determining Testing Priority:

Length of Time in a CWD Positive Herd
Length of Time in CWD Exposed Herd
Length of Time on Contaminated Soil
Length of Time since Exposure (Positive Animal or Soil) Occurred.

Specific Requirements in the Pennsylvania Program included 1) Tamper-resistant tags for <u>both</u> forms of ID, 2) Pre-approval of recipients of captive cervids – must be enrolled and approved before receiving animals, 3) Regulatory verification of decomposed cervids considered untestable, 4) Documentation of all transactions/movements:

> "Set forth the type of transaction, which included sold, lent, leased, consigned, exchanged, bartered, gifted, boarded, *moved including for breeding purposes, given, harvested or otherwise transferred and whether such transaction transferred ownership or mere possession of the cervid(s)."*

5) Inventory verification by accredited Category II Accredited Veterinarian only, 6) Regulatory verifications separate and at the discretion of USDA or PDA, 7) Annual Program inspections may include ID/inventory sample but do not serve as hands-on or distance-visual ID verification, and 8) Participant responsibility to maintain certified cervids in a continuous certified environment – supported by all movement documents.

Additional Specific Requirements in the Pennsylvania Program

Mortality testing requirement

HCP Herds

1) 100% of all mortalities of CWD susceptible cervids (>12 months) from all causes to include all suspects.
2) HCP cervids sold to HMP herds (including hunting preserves)are subject to HMP testing requirement.
3) HCP cervids that remain under the ownership of the HCP at time of harvest in an HMP preserve are subject to HCP testing requirement.

HMP Herds

50% of all mortalities of susceptible cervids (> 12 months) from all causes to include all suspects.

Recent Event October 7, 2014 – A DMA 3 captive cervid testing positive for CWD was identified through trace activity in another small herd. This herd was place in quarantine and the investigation is ongoing.

Iowa CWD Herd Depopulation 2014

David Schmitt, DVM, State Veterinarian – Iowa Department of Agriculture and Land Stewardship

Iowa's recent CWD Positive deer herd was appraised and Indemnified by USDA in 2014. A CWD Herd Plan and Fence Maintenance Agreement was put in place and a joint depopulation was undertaken August 25 – 27, 2014 with USDA VS, USDA WS, IDALS, KSU, and USDA Security. A total of 356 white-tailed deer were depopulated including 173 does and 183 bucks

The CWD herd depopulation involved extensive planning and was conducted under an Incident Command System structure. The event period included Sunday, August 24th operations staff meeting; Monday, August 25th – 109 deer depopulated and samples collected; Tuesday, August 26th – 146 deer depopulated and sampled; Wednesday, August 27th – 101 deer depopulated and sampled, followed by clean-up.

During the CWD team meeting the sampling area was reviewed and animals in the herd identified as Iowa CWD Positive Herd with Official ID tags applied to all deer in the herd. Tag identification results included:

- Does – 173 (48.6%)
  - 139 with ID tags – 80.3%
  - 34 no ID tags – 19.7%
- Bucks – 183 (51.4%)
  - 139 with ID tags – 76%
  - 44 no ID tags – 24%
- WTD in herd tagged
  - 78% with ID tags
  - 22% with no ID tags

CWD results from the infected herd included high prevalence with 284 positive animals (79.8%) and 72 deer where CWD was not-detected in the samples takes (20.2%). CWD was identified at different rates in the tissues tested:

Obex
- 6 Location – 1.7%
- 146 Not-detected – 41%
- 204 Positive – 57.3%

MRP Lymph Nodes
- 72 Not-detected – 20.2%
- 284 Positive – 79.8%

Cleaning and Decontamination Inspection occurred on September 9, 2014 with the Order of Quarantine issued August 12, 2012. The Quarantine Release was signed and sent September 12, 2014.

Research related to this CWD event

Dr. Nicholas Haley (Kansas State University) - rectal samples, nasal brushings, and blood
Tracy Nichols from National Wildlife Research Council – blood and feces
Iowa State University Veterinary Diagnostic Laboratory - blood and rectal samples

Rectal biopsies were split 3 ways for IHC (Immunohistochemistry), RT-QuIC (Realtime- Quality Induced Conversion) [an amplification assay for detecting low levels of prions, and] to ISU VDL for other research. A total of 355 samples were included in the project.

Rectal Biopsy results

IHC

Had 129 positives out of 283 positives at NVSL = 44.2 % Sensitivity- similar to RAMALT in sheep

and goats
Had 1 false positive = 98.6 % Specificity
Obex positive deer had higher rates of positive on IHC

RT-QuIC
Tissue homogenized
Had 201 positives out of 283 positives at NVSL= 67.7% Sensitivity - 50% better than IHC
6 false positives = 92.6% Specificity
Obex positives had higher rate of positive on RT-QuIC

2014 Cervid Health Program Updates

Patrice Klein, Cervid Health Program Team Leader, USDA APHIS VS; Dallas Meeks, Randy Pritchard, Owen Henderson, Alecia Naugle

Chronic Wasting Disease Herd Certification Program

The national CWD HCP and requirements for interstate movement were established when APHIS published the CWD interim final rule (9 CFR Parts 55 and 81) in June 2012. The rule became effective in August 2012. APHIS accepted public comments on preemption of State regulations, as that aspect of the rule had changed significantly since the rule was proposed. APHIS considered the preemption comments and revised the rule by amending the definition of herd plan to replace 'eradication' with 'control' of CWD and adding the definition of 'established slaughter facility'. A final rule was published in April, 2014. Comments received on other topics are held for future rulemaking. A total of 29 Approved states are participating in the national CWD HCP.

The CWD program standards accompany the rule to provide clarification and guidance on how to meet CWD herd certification program and interstate movement requirements. The standards were first published in July 2012. In response to stakeholder requests, APHIS set up a discussion group in November 2012 to provide input on revisions to these program standards. The group included representatives from the cervid industry, State animal health officials, State wildlife officials, diagnostic laboratories, and Veterinary Services. APHIS published the revised Program Standards in the Federal Register in December 2013 and accepted comments until March 31, 2014. APHIS received 328 comments reflecting the diverse stakeholder positions noted in the discussion group and made four changes as a result of these comments. The revised standards became effective on May 9, 2014. A provision exists for the annual review of the Program Standards by representatives of the cervid industry and appropriate State and Federal agencies, and further revision as necessary.

In August 2014, APHIS met with representatives from the Association of Fish & Wildlife Agencies (AFWA) to discuss their concerns with the CWD rule and program standards. Two specific topics included limitations to interstate movement and the need for retrospective epidemiologic assessments of CWD positive animals from herds monitored for many years to better assess risk of disease transmission.

As of October 2014, CWD has been confirmed in wild deer and elk in 19 U.S. States, and in farmed cervids in 13 States. In total, 22 States have identified CWD in wild and/or farmed cervids. Confirmation of the disease in a free-ranging, wild white tailed deer in northeastern Iowa in April 2014 marked the first report in the wild cervid population in this State.

To date, CWD has been reported in 65 farmed cervid herds in the United States. In the last 2 years, CWD has been identified in a red deer herd in Minnesota (May 2012), and a white tailed deer (WTD) herd each in Iowa (July 2012), Wisconsin (November 2013), and Pennsylvania (April 2014). The herds in Minnesota, Iowa, and Pennsylvania were depopulated in 2014 and provided federal indemnity. All animals from these depopulated herds are tested for CWD. No additional CWD positives were reported in the red deer; a total of 7 of 15 WTD in the PA herd were reported CWD positive; and approximately 80% of the deer in the IA herd tested CWD positive. The Wisconsin herd and the owner's hunt facility, as

well as the 5 herds in Colorado and 3 herds in Nebraska remain under State's quarantine. All mortalities from these quarantined herds are tested for CWD.

In September 2014, 2 new CWD positive WTD herds were reported, one in Wisconsin and the other in Pennsylvania (same county as previous herd). APHIS is in discussion with the state officials to consider indemnity for these herds.

Cervid Tuberculosis

In February 2013, APHIS implemented official program testing at the National Veterinary Services Laboratories (NVSL) for cervids with the CervidTB Stat-Pak and Dual Path Platform (DPP) serologic tests in captive and free-ranging North American elk, white-tailed deer, red deer, fallow deer, and reindeer. However, the CervidTB Stat-Pak was discontinued by its manufacturer in early 2014. APHIS amended and published the cervid TB serology interim final rule in July 2014 making the DPP test both a primary and secondary serology test for bovine TB in cervids. No public comments were received. VS Guidance (6701.2) on the Primary and Secondary Serological Test for Diagnosing Bovine Tuberculosis (TB) in Farmed and Captive Cervids also was amended in March 2014.

A manufacturer's shortage of the DPP test kits occurred in April 2014 resulting in an interruption of testing at NVSL for 3 weeks. NVSL banked submitted samples to test when the DPP test kits became available and reported all test results in less than 2 weeks after the remaining test kits arrived. Another manufacturer's shortage of DPP test kits is expected by the end of October due to increased submissions for serological testing at NVSL. The manufacturer is unable to resupply test kits for at least 6 weeks. NVSL will again freeze all samples received and resume testing as soon as kits are available.

In FY2014, to date, 16,300 Cervids have been tested serologically for bovine TB. Eight necropsies have been performed on serologic suspect and reactor cervids. Mycobacterial cultures for M. bovis were negative on 6 of those animals; 2 cultures are pending.

National Animal Health Monitoring System Cervid Industry Study

Beginning in September 2014, VS, in cooperation with the National Agricultural Statistics Service, initiated the first national study of the U.S. farmed-cervid industry. The study includes a survey of 3,000 producers from all States that have farmed cervids and will provide baseline industry statistics, a description of current production practices and challenges, producer-reported disease occurrences, and an overview of health management and biosecurity practices. Reports from the study should be available in Spring 2015.

Cervid Health Program Budget

The Cervid Health Program includes the CWD herd certification program and the cervid TB program within the Equine, Cervid, and Small Ruminant Health Center. In FY2014, the Cervid Health Program was appropriated $3.0 million by Congress for cervid health activities.

Funding was allocated to provide $1.1 million for indemnity, $200,000 in CWD research towards development of live animal diagnostic test methods, and $1.2 million for general program support. APHIS anticipates the FY2015 Cervid Health Program budget to remain at FY2014 levels and will propose similar funding allocations.

Committee Business:

No recommendations or resolutions were brought forward during the 2014 meeting of the Committee on Wildlife Diseases. The meeting adjourned at 5:05 PM