Report of the Committee on Wildlife Diseases
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Vice Chair: Peregrine Wolff, NV

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The Committee met on October 25, 2015 at the Rhode Island Convention Center in Providence, Rhode Island from 1230-5PM. There were 43 members and 59 guests present. Chairperson Colin Gillin welcomed the membership and guests to the 2015 Committee meeting on Wildlife Diseases and read the committee purpose and discussed committee membership and how to become a member. He also discussed the process of submitting recommendations and resolutions and asked for any new business, of which, there was none forwarded. There were no resolutions from this committee from 2014 and one proposed resolution submitted by a committee member for 2015. This resolution was emailed to the listed membership 10 days prior to the committee meeting for review.

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 2015 committee on Wildlife Diseases:

USAHA/AAWV Wildlife Student Scholarship Presentation - ***Alison Keggan V'17 Cornell***
Highly Pathogenic Avian Influenza: Biosecurity and Surveillance- A Management Perspective ***Colin Gillin***
HPAI in Wild Birds and Plans for Future Surveillance – A report from the Interagency HPAI Steering Committee ***Tom Deliberto***
2015 Bighorn Sheep Health Update – ***Peregrine Wolff***
Concordance in Diagnostic Testing For Bacterial Respiratory Pathogens in Bighorn Sheep ***Hank Edwards***
Bluetongue Virus in the Pacific Northwest: a Diagnostic Perspective ***Danielle Nelson***
U.S. Hemorrhagic Disease Update 2014-15 ***Mark Ruder***
Current Status of Brucellosis in Wyoming ***Hank Edwards***
Chronic Wasting Disease Research and Updates from Colorado ***Mike Miller***
Summary of Recent Chronic Wasting Disease events in Texas ***Mitch Lockwood***
Epidemiology of Recent Chronic Wasting Disease in Ohio ***Susan Skorupski***
USDA-APHIS-VS Cervid Health Program– ***Randy Prichard***

The first presentation given was by the USAHA Student Travel Scholarship award winner, Ms. Allison Keggan, a veterinarary student attending Cornell University School of Veterinary Medicine. 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. Ms. Keggan discussed her background and research titled ***Investigation of Trypanosome Vectors in the Home Range of Javan Rhinos in Ujung Kulon National Park, Indonesia***.

Summaries of presentations given during the general program of the 2015 Committee on Wildlife Diseases

Highly Pathogenic Avian Influenza: Biosecurity and Surveillance- A Management Perspective
Colin Gillin, Oregon Department of Fish and Wildlife
Brandon Reishus, Julia Burco

Policy, politics and the public's will are major drivers in wildlife disease and how wildlife management agencies respond and what diseases they focus on and expend and commit resources towards. Avian influenza is a good example. Highly pathogenic avian influenza (HPAI) may be considered by many to be merely a problem of the domestic poultry industry. However, it moves and is transmitted through wildlife species that serve as reservoirs. Through wild reservoir species distribution, movements, proximity and interactions with domestic animals and humans, HPAI shows us that it is as important an issue due to wildlife's connection to the disease as the disease ever has been in poultry. These reservoir species are known to wildlife managers and the public as common and plentiful. They are the managed waterfowl including at the forefront the dabbling ducks, but also potentially all wetland bird species that share wetland habitats with waterfowl. Other important considerations in the HPAI response include the multitude of stakeholders, constituents, and all humans that may interact directly or indirectly with wild and domestic avian species from hunters to the poultry consumer to any animal or human that may contract illness from an influenza. HPAI and the very concepts and drivers of disease and their components show that wildlife management can be more about managing people and their poultry property than about managing wildlife directly. We are also reminded as managers that wildlife-related loss or damage to property and domestic animals associated with predation, crop loss, or disease like HPAI, is an issue involving management and wildlife policy.

In this presentation, the migratory bird flyways were discussed. A flyway is a geographic area where groups of migratory birds generally confine their movements between seasonal habitats. We examined the concept of the globe basically being one large over-lapping flyway extending N- S and also in an overlapping E - W direction. It is important from an animal and disease movement standpoint to understand how and why they are used by waterbirds. In North America as in many places of the world, it is interesting that even non-adjacent flyways overlap in areas such as the Atlantic and Pacific flyways in their northern reaches. These animal and disease connections occur worldwide.

We looked at how the Eurasian H5N8 subtype was circulating in Korea in early 2014. This virus type occurred in the East Asian Flyway which covers about ½ of Eastern Siberia. It also overlaps with most if not all Eurasian Flyways and the Pacific flyway on the northern breeding grounds. One assumption of this outbreak was that infected birds migrated north from Korea/Japan. Then on Summer staging areas in Eastern Siberia they mixed with birds from all over Eurasia and North America. Newly infected flocks migrated then down their respective flyways including south in western Canada to Washington, Oregon, and California. By November 2014, the stage was set for the present North American outbreak. Detections were also seen simultaneously in England, Netherlands, and Germany.

Many of the carriers and reservoir waterfowl species are known. However, shorebirds and seabirds also share these habitats with infected waterfowl. And many of these species can carry disease extreme distances in short time periods (i.e. bar-tailed godwits c.6,000 km flight to Alaska in4.5 days).

Some Basic Principles of Current Outbreak: This virus causes no significant pathology in waterfowl or reservoir species. However, it does cause significant disease and is a threat to domestic poultry and is not currently a significant risk to wild or domestic mammals or humans.

So what are the issues in Wildlife? There are wildlife species at risk. We've seen some pathology and mortality to some raptor species consuming infected reservoir hosts and exposed Canada geese have indicated neurological pathology - So there is precedent for concern. There are industries and communities affected. Falconry has see the greatest risk and mortality in the western US. Zoological collections are always a consideration although most generally have adequate biosecurity but are also magnets for wild birds. Gamebird farms and competitive gamebird dog trials are a constituency of wildlife management and requires reaching out and communicating and educating. Again, biosecurity is a major preventative measure. Wildlife rehabilitation is a major concern in HPAI outbreaks. Most state wildlife management agencies regulate and many interact closely with this community of important stakeholders. Rehabbers have the ability to provide tremendous community outreach – they are also high on the risk scale for having a HPAI bird in their possession. And then people that interact directly and indirectly with wild birds – hunters, agency personnel (duck banders) researchers, and the public, all are at some level of risk. HPAI can change from a poultry disease to a human health crisis in short order.

With this in mind, it is important to remember viruses change and evolve. This can increase virus virulence or make reservoir species become morbidity and mortality cases. An change in the virus from a seemingly innocuous poultry virus can suddenly affect mammal and other very mobile bird species. And most importantly humans can become morbidity case. How viruses change and evolve is complex and unraveling how this occurs will take funding and time.

HPAI in Wild Birds and Plans for Future Surveillance – A report from the Interagency HPAI Steering Committee

Tom DeLiberto, USDA APHIS, Wildlife Services, NWRC

A novel H5 clade 2.3.4.4 highly pathogenic avian influenza virus (HPAIV) was detected in North America in late 2014. Motivated by both the alarming spread of new H5 variant viruses in Asia and Europe as well as by the detection of HPAIV in both domestic poultry in Canada and in wild and captive birds in Washington, an intensive study was initiated to conduct HPAIV surveillance in wild birds in the Pacific Flyway of the United States, followed by additional surveys in the Central and Mississippi Flyways. Findings of HPAIV positive samples widespread in wild waterfowl suggest that some species suffer no detectable morbidity and mortality once infected, although clinical disease has been documented for some wild bird species and losses in US domestic poultry are unprecedented.

In July, 2015, state and federal agencies initiated a National Surveillance effort to provide information that will improve management actions that are taken to address the multitude of issues associated with HPAIVs. This includes risks to commercial poultry, backyard poultry, game bird farms, wild birds, wild bird rehabilitation facilities, falconry birds, and captive bird collections in zoos/aviaries. Specific objectives of the plan are to: 1) identify the distribution of influenzas of interest by U.S. flyways and through select, high priority watersheds; 2) detect spread of influenzas of interest to new areas of concern; and 3) provide a flexible surveillance framework that can be modified to monitor wild waterfowl populations for re-assortments of influenzas, introductions of new viruses, and to estimate apparent prevalence of important influenzas once detected in an area of concern.

Update of Pneumonia in Bighorn Sheep

Peregrine Wolff, Nevada Department of Wildlife

Dr. Wolff reviewed bighorn sheep health during 2015 including topics concerning bighorn sheep pneumonia and bighorn sheep / domestic sheep interactions; collaboration with the domestic sheep industry, policy, research, and publications.

The Western Association o Fish and Wildlife Agencies Herd health Monitoring Recommendations were presented and completed in July 2014

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.

A July 2015 Train the Trainer workshop was conducted by the WAFWA BHS experts and held in Ft. Collins, CO. Instructors were from from BC, CO, NV, WY with attendees from all western state agencies, BC, NWT and NPS. The training reviewed sampling guidelines, anatomy, equipment, laboratory techniques, clinical signs, under the microscope and photographic techniques along with case reviews. There was also hands on live animal sampling, sample handling, and necropsy.

Disease management - Lambs recruitment can be 0% for many years (+/- 18). Lambs are born healthy but later die of pneumonia. Survivors may still carry the bacteria. Current management questions - Why do some herds suffer little to no annual lamb mortality? Why do some herds suffer annual lamb mortality? Can we do anything about it?

Mycoplasma ovipneumoniae - New Strain Introductions. Multiple strain types of M. ovi are found in large domestic sheep flocks. However, single strain type is found in nearly all in BHS die-offs. Interestingly, domestic goats carry separate strains of M. ovi..

Recently the American Association of Wildlife Veterinarians and The Wildlife Society put together a Joint Issue Statement on Domestic sheep and goats disease transmission risk to wild sheep. This is available on both the AAWV and TWS websites.

The Federal Land Management Agency Risk Assessment Analysis for 2016 Appropriations Language directs the Forest Service and BLM to 1) complete risk analysis of allotments with risk of contact between domestic and wild sheep; 2) Identify alternative grazing allotments suitable for domestic sheep; and 3) Engage stakeholders in the analysis and encourage collaboration in finding solutions

Concordance in Diagnostic Testing For Bacterial Respiratory Pathogens in Bighorn Sheep.
William Edwards, Wyoming Game and Fish Department
Daniel Walsh, Frances Cassirer, Michael Bonds, Daniel Brown, William Edwards, Glen Weiser, Mark Drew, Robert Biggs, Karen Fox, Michael Miller, Sudarvili Shandthalingam, Subramaniam Skirumaran, and Thomas Besser.

Reliable diagnostic tests are essential for wildlife disease investigation and management. Laboratory diagnostic tests for wildlife diseases are generally adopted from published methods, but frequently vary

between laboratories due to the lack of standardized commercial kits. Ring and proficiency tests provide independent measures of laboratory performance in comparison with known standards or results from other participating laboratories. To evaluate the reliability of diagnostic testing for bacterial respiratory pathogens of bighorn sheep (Ovis canadensis), we conducted a series of ring tests across six diagnostic/research laboratories and three reference laboratories routinely involved in detection of Mycoplasma ovipneumoniae, Pasteurellaceae, and/or the Pasteurellaceae gene encoding leukotoxin (lktA). Consistency of results for replicate samples within laboratories was high (median agreement = 1.0). Median agreement between laboratories was high for PCR detection of M. ovipneumoniae and culture isolation of Mannheimia spp. and B. trehalosi (median agreement 0.89 – 0.95, Kappa 0.65 - 0.74), and lower for PCR detection of Mannheimia spp. lktA (median agreement 0.58, Kappa 0.12). Most errors on defined status samples were false negatives, suggesting that test sensitivity was a greater problem than specificity. However, tests for M. haemolytica and for lktA also yielded some false positive results. Despite differences in testing protocols, median agreement among laboratories and correct classification of controls for most agents was 0.80 or higher, meeting or exceeding the standard required by federal proficiency testing programs. This information is valuable for interpreting test results, for laboratory quality assessments, and for advancing diagnosis of respiratory disease in wild sheep.

Bluetongue Virus in the Pacific Northwest: a Diagnostic Perspective

Nelson Danielle D., Washington State University, Veterinary Microbiology and Pathology
Wolff, PL, Mansfield KG, Johnson DJ, Bradway, DS, Evermann JF, and Baszler TV

Bluetongue virus (BTV), an Orbivirus that is closely related to Epizootic Hemorrhagic Disease Virus (EHDV), has periodically caused disease outbreaks in wild and domestic ruminants in the Pacific Northwest over the last 60 years. BTV is diagnosed in tropical, subtropical, and temperate regions during the summer and late fall between approximately 50o North and 35o South. Only a few Culicoides sp. have been proven to serve as vectors for viral transmission, and in the United States, C. sonorensis and C. insignis are the vectors. BTV infection can be clinical or subclinical in ruminants, and while domestic sheep and wild deer commonly have clinical disease, disease in domestic cattle, goats, and South American camelids is sporadic. In 2015 (through mid-October), the Washington Animal Disease Diagnostic Laboratory detected BTV nucleic acid by RT-PCR from the following animals located in Washington, Idaho, Nevada, Oregon, and California: 33 deer, 14 domestic sheep, 8 domestic cattle, 6 bighorn sheep, and 1 yak. Serotype 17 was identified in 21 of the animals and serotype 13 was identified in 1 cow from Nevada. By contrast, in 2014 BTV was identified in 3 cattle and 1 domestic sheep from Washington, and the serotype was not determined. Clinical signs are associated with increased vascular permeability and can include fever, hyperemia and congestion, oculonasal discharge, facial edema, hemorrhage and erosions of mucous membranes, coronitis and lameness and generalized weakness and depression. In addition, internal postmortem lesions are related to systemic vascular endothelial damage and include edema (especially in the subcutis and lung), hemorrhage, and ischemic necrosis of many tissues from microvascular thrombosis. A “blue tongue” can develop in sheep due to necrotizing vasculitis, ischemia, and resultant cyanosis. Sudden death without detectable gross lesions is also considered a classic presentation. Histologically, vascular necrosis or inflammation are often not detected histologically, subtle lesions such as edema may be confounded by autolysis, and euthanasia due to gunshot may confound gross and histological detection. The clinical presentation, species affected, and lesions due to Epizootic Hemorrhagic Disease Virus are very similar, and these viruses should be considered when diagnosing outbreaks of hemorrhagic disease and sudden death in the late summer and fall. In subclinically affected species such as pregnant cattle, congenital malformations and reproductive losses are observed in the subsequent calving season, and while this may occur in subclinically infected wild ruminants, detection would be unlikely. Laboratory confirmation of BTV infection involves either identification of the virus or identification of the host response to infection (serology). Identification of BTV agent is most useful to confirm clinical cases, to determine individual animal freedom from infection, and to investigate infection prevalence. Serology is not useful to confirm clinical cases, but is useful for determination of population or individual animal freedom from infection, investigation of infection prevalence, and determining post-vaccination immune status. Identification of agent is most often done by RT-PCR to identify BTV genetic material and can be used for virus strain typing; RT-PCR can differentiate BTV from EHD. The best samples for RT-PCR testing are whole blood, and fixed or fresh lung, spleen,

kidney, brain or other tissues with lesions. Agar gel immunodiffusion (AGID) is a good screening serology test for Orbivirus infection. The competitive ELISA is specific for BTV, and virus neutralization test from an isolate can be used for strain serotyping. Altogether, BTV causes outbreaks of acute disease and reproductive loss in domestic and wild ruminants. Tracking infection and serotype prevalence and distribution is necessary to understand the epidemiology of this important vector-borne virus infection.

U.S. Hemorrhagic Disease Update 2014-2015

Mark G. Ruder, Clara Kienzle, David E. Stallknecht, SCWDS, University of Georgia

During 2014, there were 27 viruses isolated from 114 virus isolation attempts made, representing 22 states and 6 species (98 white-tailed deer, 6 bison, 4 mule deer, 3 big horn sheep, 2 black-tailed deer, and 1 elk). Isolations of EHDV-2, EHDV-6, BTV-17, and BTV-18 were made from white-tailed deer and EHDV-2 was isolated from a black-tailed deer (see Table). The isolation of BTV-17 represents the first isolation of any BTV serotype from New Jersey. As of September 30, 2015, there have been 40 viruses isolated from 113 virus isolation attempts made, representing 19 states and 5 species (103 white-tailed deer, 4 mule deer, 3 elk, 2 key deer, and 1 bison). Isolations of EHDV-1, EHDV-2, EHDV-6, and BTV-17 were made from white-tailed deer.

2014 SCWDS Hemorrhagic Disease Diagnostics
Virus Isolations

STATE	SPECIES	VIRUS
Florida	white-tailed deer	EHDV-6
		BTV-18
Georgia	white-tailed deer	EHDV-2
Idaho	white-tailed deer	EHDV-2
Kentucky	white-tailed deer	EHDV-2
Louisiana	white-tailed deer	EHDV-2
		EHDV-6
Mississippi	white-tailed deer	EHDV-2
Montana	white-tailed deer	EHDV-2
New Jersey	white-tailed deer	BTV-17
North Carolina	white-tailed deer	EHDV-6
Oregon	black-tailed deer	EHDV-2

2015 SCWDS Hemorrhagic Disease Diagnostics
Virus Isolations
Thru September 30, 2015

STATE	SPECIES	VIRUS
Florida	white-tailed deer	EHDV-1
		EHDV-6
Idaho	white-tailed deer	BTV-17
Indiana	white-tailed deer	EHDV-2
Kansas	white-tailed deer	EHDV-2
Kentucky	white-tailed deer	EHDV-2
Louisiana	white-tailed deer	EHDV-2
Mississippi	white-tailed deer	EHDV-2
Missouri	white-tailed deer	EHDV-2
Montana	white-tailed deer	BTV-17
North Carolina	white-tailed deer	EHDV-6

Current Status of Brucellosis in Wyoming

William Edwards, Wyoming Game and Fish Department
Hally Killion, Kylie Sinclair, Jessica Jennings-Gaines, and Mary Wood.

Brucellosis is an infectious disease caused by bacteria of the genus Brucella. Despite nationwide eradication efforts in the US, Brucella abortus remains a significant concern to livestock producers due to wildlife reservoirs in the Greater Yellowstone Area (GYA). While it is believed that B. abortus has minimal population impacts in bison and elk, the disease can cause significant economic losses in the livestock industry. In Wyoming, B. abortus has remained localized within elk and bison in the GYA since its initial discovery in bison in 1917. Over the past three years, seven brucellosis seropositive elk have been documented in the Bighorn Mountains of North Central Wyoming. This represents the first detection of seropositive elk outside of the GYA in Wyoming and presents the threat of brucellosis spreading to and becoming established in areas outside of the GYA.

Chronic Wasting Disease Research and Updates in Colorado
Michael Miller, Colorado Division of Parks and Wildlife

Dr. Michael Miller, Colorado Division of Parks and Wildlife, led a brief discussion on the implications of a recent study on chronic wasting disease (CWD) host range. The Case Western study results, presented at an international prion conference in May 2015, complement other efforts to assess human susceptibility to chronic wasting disease that have been ongoing since the mid-1990s. Findings from a variety of experimental & epidemiological studies support messaging since the mid-1990s that human illness resulting from CWD exposure appears unlikely. The new study's results are consistent with other previous & contemporary data suggesting a low probability of human prion disease resulting from CWD exposure. Dr. Miller noted that even though human illness seems unlikely, minimizing the occurrence of CWD and encouraging other precautions for minimizing human exposure to CWD may be prudent. Trends observed in Colorado since 2002 suggest increasing infection rates in affected mule deer and elk herds, with the exception of one population unit intensively managed through harvest in the early 2000s. Controlling CWD will likely need to rely on hunting in order to remain politically, socially, and fiscally sustainable. Consequently, early intervention -- while infection rates are still low -- may offer the best opportunity to both suppress epidemics and minimize the likelihood of hunters harvesting infected animals. Dr. Miller suggested that the timing and approaches to CWD control may deserve more attention and reconsideration than given in recent years.

Summary of Recent Chronic Wasting Disease events in Texas
Mitch Lockwood, Texas Parks and Wildlife Department
Bob Ditmar (TPWD), Andy Schwartz, Texas Animal Health Commission

Introduction:
- 3.9 million free-ranging white-tailed deer
- 700K white-tailed deer hunters
- 600K white-tailed deer harvested annually
- $3.6 billion economic output for all hunting
- $2.1 billion for deer hunting
- 1,300 deer breeding facilities
- > 110,000 deer in breeding facilities
- > 2,200 free-ranging deer moved annually through various permits

Texas Parks and Wildlife Department (TPWD) has been conducting CWD surveillance throughout the state since 2002. Biologists have collected more than 26,000 samples from hunter-harvested deer, and others have collected more than 21,000 samples in order to meet TPWD permitting requirements, totaling almost 48,000 samples. Additionally, Texas Animal Health Commission (TAHC) has maintained a Voluntary CWD Herd Certification Program since 1995.

In 2012, CWD was discovered in 2 mule deer samples from far West Texas (Hueco Mountains) as a result of a targeted surveillance effort. This area is directly adjacent to a region in New Mexico with

documented CWD occurrence. To date, five more positive samples have been obtained from this population through hunter harvested mule deer, indicating a disease prevalence of 10%.

Mule deer and white-tailed deer are regulated by TPWD, while other susceptible species (including elk) are regulated by the TAHC. This has generated the need for enhanced coordination and communication between these two agencies.

The TPWD/TAHC CWD Management Plan was developed by both agencies in consultation with the state's CWD Task Force. The Task Force is comprised of wildlife biologists, deer and elk breeders, veterinarians and other animal-health experts from TPWD, TAHC, Texas Veterinary Medical Diagnostic Laboratory, Texas Department of State Health Services, Texas A&M College of Veterinary Medicine, and USDA. The plan includes mandatory check stations for susceptible species taken inside the CWD Containment Zone, which covers portions of Hudspeth, Culberson, and El Paso counties. Artificial movement of deer is prohibited in the CWD Containment Zone.

On June 30, 2015 a sample from a Medina County (area on border of southern Edwards Plateau and northern South Texas Plains ecoregions) deer breeding facility was confirmed positive for CWD. The index breeding facility participated in TAHC's voluntary CWD Herd Certification Program, and had tested 62 of 65 mortalities prior to June 2015 (60 not detected, 2 location results) since permitted in 2006. There were a total of 136 adult deer in the inventory on June 30, 2015, and the herd was considered to be relatively young.

During the previous 5 years, 107 deer were transferred from 30 deer breeding facilities into the index facility. During that same period, 835 were transferred from the index facility to 147 different facilities including 96 deer breeding facilities, 46 release sites, 3 DMP sites, and 2 sites in Mexico.

TPWD and TAHC immediately placed a temporary moratorium on movements of all captive deer in the state, and TAHC placed a Hold Order on the 177 "Tier 1" facilities. Since then, TPWD and TAHC worked with the CWD Task Force and industry stakeholders to develop a plan to lift the moratorium on deer transfers, which includes additional CWD testing requirements in deer breeding facilities or on registered release sites. Additionally, TAHC has removed the Hold Order for 120 facilities, leaving a total 57 facilities remaining under a Hold Order as of October 16, 2015. Most deer breeding facilities were authorized to transfer deer by August 24, 2015.

Depopulation at the index facility was initiated in July 28 and completed on September 30, 2015. CWD was detected in a total of 4 (out of 136 adults) white-tailed deer in the index facility, all of which were 2-year-old bucks that were natural additions.

On September 15, 2015, CWD was confirmed in one of the trace-forward facilities, from which 84 deer had transferred out to 9 different facilities (5 deer breeding facilities, 3 release sites, and 1 nursing facility) since it received deer from the index herd. This resulted in 7 additional Hold Orders being issued by TAHC, 4 of which have since been released. The CWD-positive at the trace-forward facility was also a 2-year-old buck that was born in the index facility.

In summary, CWD has been detected in a total of 5 captive white-tailed deer in Texas, 4 of which were located in the index facility, and 1 was located in a trace-forward facility. There are 36 deer from the 2-year-old cohort originating in the index facility that are reported to be alive in 7 deer breeding facilities, and possibly as many as 6 deer from that cohort still alive on release sites. Additionally, there are 33 deer that traced through the index facility that are still alive in 15 deer breeding facilities, and possibly as many as 51 trace-through deer are still alive on 24 different release sites, and 2 trace-through deer may still be alive in Mexico.

TPWD has intensified the statewide CWD surveillance efforts, with a goal to collect samples from more than 8,000 hunter-harvested deer, including 300 samples within a 5-mile radius of the index facility. TAHC will continue to pursue indemnity on exposed deer located in trace-forward facilities in an attempt to conduct a more thorough epidemiological investigation. TPWD and TAHC have committed to

reevaluate movement qualification standards that apply to deer breeding facilities and release sites following the 2015-16 hunting season. Both agencies are exploring ante-mortem testing protocols, and will continue to seek guidance from experts in the field.

Epidemiology of Recent CWD Cases in Ohio
Susan Skorupski, Assistant Director, USDA-APHIS-VS

Background
Ohio has had a voluntary Chronic Wasting Disease (CWD) Herd Certification Program for all cervidae for at least 12 years. Ohio has 331 cervidae herds in the CWD monitoring program with 256 at Certified level. In October 2012, Ohio White Tail Deer rule became effective. It includes several categories of white tail deer operations. Monitored Herds cannot sell or give away animals and includes hunting preserves. Under this rule, hunting preserves cannot move live animals from the premises and must annually sample 30 animals or 30% of harvested deer, based on the number of deer harvested during the previous year. Herds with Status are herds enrolled in the CWD Certification Program but not yet at certified level. Certified Status Herds are enrolled in the CWD monitoring program and have reached certified status. Ohio has 135 Monitored Herds, including 24 hunting preserves, 75 Herds with Status, and 256 Certified Status herds.

Ohio's approach to infected animals and associated animals and herds
Infected herd – herd where a CWD infected animal resided when the test positive sample was collected. Herd quarantined.

Exposed herd – any herd where an animal that tested CWD positive has resided within the 5 years before the CWD diagnosis. Whole herd quarantined

Herd that contains an exposed animal – whole herd quarantined unless epidemiology information suggests the animal is of lower risk of spreading CWD.

Exposed animal – animal that was exposed to the CWD infected animal any time during the five years prior to when the animal died or was euthanized and sampled/tested positive for CWD.

Recent CWD history in Ohio

a.Pennsylvania traces
In the spring of 2014, Ohio received information on traces associated with CWD positive cases in Pennsylvania. Three Ohio herds were designated as Exposed herds because positive deer from infected herds in PA had been in the Ohio herd s during the previous 5 years. Fifty Ohio herds received 256 exposed deer from the 5 PA herds and 3 Ohio exposed herds. 85 of those animals were tested with Not Detected results in Ohio herds. 66 animals were traced to Out of State herds. That leaves 101 animals either standing in quarantined herds or not tested when they died or were harvested. 18 herds/preserves remain under quarantine.

b. First CWD positive found in Ohio
On October 22, 2014, National Veterinary Services Laboratory (NVSL) confirmed a CWD positive result for a 2.5 year old buck killed at a hunting preserve in Holmes County Ohio on October 2, 2014. The hunting preserve had been under quarantine since April 1, 2014 because of PA traces and was required to do 100% sampling of harvested deer. The positive animal had official identification tracing the animal to a CWD certified Pennsylvania herd. Records including a Certificate of Veterinary Inspection indicate the animal moved to Ohio March 13, 2013. Genetic testing was conducted to support the accuracy of the trace to the Pennsylvania herd. This herd was depopulated without indemnity April 27-29, 2015. 224 animals were depopulated at owner expense and sampled for CWD. All tests had Not Detected results for CWD. The premises was evaluated as a minimally contaminated facility. No cervidae have been added to the premises at this time.

The owner of the hunting preserve business also owns or is associated with breeding herds at other locations in Holmes County.

c. Second positive premises in Ohio
A white tail deer breeding herd owned by the same person who owned the CWD positive hunting preserve was designated as a positive herd in the spring of 2015. A CWD positive animal was sampled on 3/12/2015 and reported on March 25, 2015. The animal was a 5 year old whitetail doe purchased from a Wisconsin herd in February 2013. A second CWD positive animal was reported from this herd on May 22, 2015. This animal was a 1.5 year old natural addition doe.

This herd was initially established in the fall of 2012 with the purchase of a CWD certified herd from the estate of a deceased owner. In the spring and fall of 2013, additional animals were added from at least 9 OH herds , 1 WI herd, 17 PA herds, and 3 IN herds. This herd had been quarantined since April 1,2014 because of traces from several CWD exposed or positive herds in Pennsylvania, including the herd that was the source of the CWD positive deer in the Ohio hunting preserve. It had received over 120 animals from these herds.

On June 15 and 16, this herd was depopulated with federal indemnity. Samples were collected for research purposes. 241 animals including 44 fawns were euthanized, sampled and tested. Sixteen additional positive were identified. They originated from 5 Ohio CWD certified herds and 4 Pennsylvania CWD certified herds. One of the Ohio herds was the herd that was used to initially establish this herd. One positive animal was over 60 months of age so that Ohio herd was not designated as an exposed herd. The other three Ohio herds were quarantined as exposed herds.

Records reviews identified 334 exposed animals associated with Ohio exposed herds. 42 Ohio herds containing these animals were quarantined. They have remained under quarantine until the quarantined animal(s) are euthanized and tested Not Detected for CWD or 60 months have passed since animals entered the herd. From Ohio Exposed Herd 1, 56 animals moved to 21 Ohio herds and 83 animals moved out of state. 27 animals were either already dead and tested with CWD Not Detected results or have since been tested with CWD Not Detected results. From Ohio Exposed Herd 2, 76 animals moved to 16 Ohio herds and 94 animals moved out of state. 25 animals were either already dead and tested with CWD Not Detected results or have since been tested with CWD Not Detected results. From Oho Exposed Herd 3, 21 animals moved to 5 Ohio herds and 4 animals moved out of state. 7 animals were either already dead and tested with CWD Not Detected results or have since been tested with CWD Not Detected results. Ohio received 2 exposed animals from the exposed herd in Pennsylvania associated with this case. In summary, 334 exposed animals were identified and traced to 40 Ohio herds. 59 of those in Ohio have been tested with Not Detected CWD results. 181 have been traced out of state and 94 are still standing in 26 quarantined herds/hunting preserves.

Ohio Exposed Herd 1 has been in the CWD Certification Program since September 2003 and has an inventory as of 48 head over 1 year old. Ohio Exposed Herd 2 has been in the CWD Certification Program since October 2003 and has an inventory of 93 animals. Ohio Exposed Herd 3 has been in the CWD Certification Program since February 2009 but started with a status date of May, 2001 and has an inventory of 17 deer.

In addition Ohio received reports of 72 exposed deer form OOS Exposed herds traced to 18 Ohio herds. 18 of those animals had moved to out of state herds. 30 animals were tested in Ohio with Not Detected results. 12 animals remain in 7 quarantined herds.

The summary of all traces associated with positive cases in Ohio and Pennsylvania in 2014 – 2015 are:

Total exposed animals traced to Ohio:661
Total tested Not Detected: 176
Total animals traced to Out of State Premises: 265
Total premises initially quarantined 87
Total premises remaining quarantined: 40

Total Hunting Preserves quarantined: 10

USDA Cervid Health Program Updates
Randy Pritchard, USDA, APHIS, Veterinary Services

Voluntary Chronic Wasting Disease (CWD) Herd Certification Program
The APHIS National CWD Herd Certification Program (HCP) was implemented in 2014. It is a voluntary Federal-State-industry cooperative program administered by APHIS and implemented by participating States. The program provides uniform national herd certification standards that minimize the risk of spreading CWD in farmed cervid populations. Participating States and herd owners must comply with requirements for animal identification, fencing, recordkeeping, inspections/inventories, as well as animal mortality testing and response to any CWD-exposed, suspect, and positive herds. APHIS monitors the Approved State HCPs to ensure consistency with Federal standards through annual reporting by the States. With each year of successful surveillance, participating herds will advance in status until reaching five years with no evidence of CWD, at which time herds are certified as being low-risk for CWD. Only captive cervids from enrolled herds certified as low risk for CWD may move interstate. Currently, 30 States participate in the voluntary CWD Herd Certification Program; 29 have Approved HCPs and one has Provisional Approved status. VS is working with the remaining State to transition it to Approved status. FY2015 marks the second year that Approved States have submitted their CWD HCP annual reports to APHIS. APHIS is currently reviewing these reports.

Review of CWD Program Standards

The CWD Program Standards provide clarification and guidance on how to meet CWD Herd Certification Program and interstate movement requirements. VS committed to an annual review of the Program Standards by representatives of the cervid industry and appropriate State and Federal agencies. VS planned to perform a review in FY2015; however, this did not occur due to the response to highly pathogenic avian influenza (HPAI). VS expects to conduct a review in FY2016.

CWD in Farmed and Wild Cervids

Retrospective Epidemiology of CWD in Farmed Cervids: In response to a 2014 USAHA Resolution, VS asked States to include a retrospective summary of the epidemiology of all positive herds with their annual HCP reports for FY2015. Unfortunately, the response to HPAI delayed completion of this summary. Five States reported information to date. A few States indicated that they did not have the resources to devote to this request. VS will continue to gather this data and to collect more comprehensive data in the future.

Summary of CWD detections. As of September 30, 2015, CWD has been confirmed in wild deer and elk in 21 U.S. States, and in farmed cervids in 16 States. In total, 23 States have identified CWD in wild and/or farmed cervids. CWD has been reported in 70 farmed cervid herds in the United States. Confirmation of the disease in 3 free-ranging, wild white-tailed deer in Michigan in 2015 marked the first report of CWD in the wild cervid population in this State.

FY2015 CWD Detections in Farmed Cervids: In FY2015, CWD was identified in eight farmed cervid herds: one white-tailed deer breeding herd in Pennsylvania, one elk breeding herd in Utah (traced back from a hunting facility in Utah), one white-tailed deer (WTD) breeding herd and one WTD hunting preserve in Ohio (owned by the same producer), two WTD breeding herds in Wisconsin, one WTD and elk herd in Texas, and a second WTD herd in Texas (traced from the first positive herd in Texas). The positive animals in Utah, Ohio, and Texas represented the first reported cases of CWD in captive cervids in all three of these States.

White-Tailed Deer Breeding Herd, Pennsylvania: On October 6, 2014, the National Veterinary Services Laboratories (NVSL) confirmed CWD in a 6-year-old doe from a captive WTD breeding facility in Reynoldsville, Pennsylvania. The doe was euthanized and tested because she was classified as a CWD-

exposed animal that had previously resided in ***two*** trace back exposed herds. This herd was assembled in 2013 through the purchase of 16 animals from other HCP-certified herds in Pennsylvania, and had been under quarantine for receiving exposed animals from a trace back exposed herd. The remaining herd of eight WTD was depopulated with Federal indemnity on February 18, 2015, and no additional positive animals were detected. USDA collected samples for research purposes.

Elk Breeding Herd, Utah: On December 23, 2014, NVSL confirmed CWD in 3-year-old captive elk. The elk had been at a hunting park located in northern Utah, where he had resided for approximately 3 weeks prior to being hunter killed. All hunter-killed animals at the hunt park are required to be tested for CWD, and this animal was sampled through routine surveillance. The elk was traced back to its herd of origin, and that facility was quarantined. The herd was assembled in 1999 with bulls, and later elk cows, that originated from Colorado. Historical testing records for the herd were unavailable. The remaining 70 elk were depopulated using Federal indemnity funds on March 3, 2015, and an additional 25 elk were confirmed as CWD-positive. USDA collected samples for research purposes.

White-Tailed Deer Hunting Preserve, Ohio: On October 22, 2014, NVSL confirmed CWD in a buck taken from a captive WTD deer hunting preserve in Ohio. This was the first time that CWD had been detected in Ohio. The preserve was tested as part of Ohio's CWD monitoring program. The herd had been under quarantine since April 2014 because it was a trace-forward herd associated with a CWD-exposed herd in Pennsylvania. The positive animal was traced to its herd of origin, a captive WTD breeding herd in Pennsylvania, through DNA identity testing. On November 26, 2014, the Ohio State Veterinarian issued an Order of Destruction for animals on the hunting preserve. The State executed this Order on April 27-30, 2015. The herd of 224 WTD was depopulated and no other positives were detected. USDA did not provide Federal indemnity.

White-Tailed Deer Breeding Herd, Ohio: On March 31, 2015, NVSL confirmed CWD infection in a 5-year-old WTD doe from a captive breeding herd in Holmesville, Ohio. The index animal was received from a Wisconsin WTD farm in January 2013. The CWD-positive herd was owned by the same individual as the Ohio hunt preserve that was found to be CWD positive in October 2014. On May 22, 2015, NVSL confirmed a second positive case in the same herd -- a yearling WTD doe that was a natural addition in the same breeding herd. The herd had been under quarantine since April 1, 2014 due to epidemiological linkages with two WTD herds in Pennsylvania – one a positive herd and the other a traceback exposed herd. USDA provided Federal indemnity and depopulated this herd on June 15 and 16, 2015. USDA collected samples for research purposes. NVSL confirmed CWD in 16 additional animals in the herd. Of the 16 positives, one was natural addition and the rest were purchased additions. The positive animals were purchased from February 26, 2013 through September 24, 2013, except for one purchased in 2012. Eleven purchased additions traced-back to 3 herds in Pennsylvania and four purchased additions traced to three other herds in Ohio.

White-Tailed Deer Breeding Herd, Wisconsin: On October 6, 2014, NVSL confirmed CWD in a 2-year-old doe born in June of 2012 that died on a Richland County farm. The facility is within the CWD management zone in Wisconsin. The remaining 51 deer were euthanized on November 20, 2014, and seven additional positives (all males born in 2012) were found. Two of these 7 were purchased additions with the last added to the herd in January 2013. All sales from this herd were to shooting preserves. This premises was double fenced and had been compliant in a herd certification program for over 10 years.

White-Tailed Deer Breeding Herd, Wisconsin: On June 19, 2015, NVSL confirmed CWD in a 7-year-old female WTD from a breeding facility in Eau Claire County. The doe was a natural addition to this breeding herd. This is the first positive CWD case, captive or wild, in this county. The doe was found dead and was showing no clinical signs of CWD at the time of death. Since 2003, this herd has tested 391 animals for CWD and all had "not detected" results. In addition, 317 animals have tested "not detected" from the associated hunting preserve over the same time period. A second positive natural addition doe from this herd was confirmed positive by NVSL on September 10, 2015. Several escape episodes have occurred from this herd. The herd is currently under quarantine and plans are underway for depopulation with State indemnity.

White-Tailed Deer and Elk Breeding Herd, Texas: On June 30, 2015, NVSL confirmed CWD in a 2-year-old WTD buck from a captive WTD and elk breeding herd in Medina County, Texas, approximately 500 miles from previously reported positive free-ranging mule deer in far West Texas. This was the first time that the disease had been detected in farmed cervids in the State. The index buck was born on the premises and found dead on June 18, 2015. Over 40 high-risk deer (i.e., pen mates, dam, others) were euthanized and tested after the index case was found. The NVSL confirmed CWD infection in two of those deer. Interestingly, all three of the positive deer identified to date on this premises have the same AI sire. However, the significance of this finding is unclear. In the past 5 years, records indicate that 130 WTD from 33 facilities moved into the positive herd and 838 WTD moved out of the positive herd to 147 different herds. One positive WTD was found in one of these trace-out herds (see herd description below). Additionally, 23 elk were also moved from this herd to another herd in TX in 2014. All trace-outs have been intrastate except for movements to two premises in Mexico. Premises that have received deer from the index herd are under movement restrictions. VS is collaborating with animal health authorities in Mexico. VS paid indemnity and depopulated this herd on September 30, 2015, and no additional positive animals were detected. USDA collected samples for research purposes.

White-Tailed Deer Herd, Texas: On September 14, 2015 NVSL confirmed CWD from tissues from a WTD in Lavaca County, Texas. This animal was a traceout from the first CWD positive herd from June 30, 2015. Additional epidemiology is ongoing.

Cervid Tuberculosis

The CervidTB Stat-Pak and Dual Path Platform (DPP) serologic tests were approved for use in captive and free-ranging North American elk, white-tailed deer, red deer, fallow deer, and reindeer effective February 4, 2013. In early 2014, the CervidTB Stat-Pak was discontinued by its manufacturer and an amended interim final rule was published in July 2014 making the DPP test both a primary and secondary test for TB in cervids. Animals that have 2 consecutive positive tests at least 30 days apart are classified as TB reactors, and APHIS provides indemnity for these animals to conduct further diagnostic testing.

In FY2015, 15,486 cervids were tested serologically for bovine TB, and 31,862 cervids have been tested since introduction of the serological tests in 2013. In FY 2015, primary DPP serological testing identified 62 TB suspects of which 21 of these animals had negative tests when retested at least 30 days after the primary test. Twenty-three cervids were identified as TB reactors when tested positive to the secondary DPP test. Thirty-one necropsies have been performed on suspect and reactor cervids in FY 2015. Mycobacterial culture results are available on 30 of these animal's tissues at this time. Twenty-six of the cultures were negative, two were identified as *M. avium* and two identified as *M. intracellular.* No cultures have been positive for *M. bovis* in FY 2015.

VS recently completed a statistical analysis of the DPP testing data, including optical density (OD) levels, for the previous 3 years of testing. The specificity of the first DPP test using the current cut-off OD value was 99.6% while the specificity after the second DPP test was 99.86%. The false positive percentage of 0.034% is considered very low. Based on this analysis, raising the OD cut-off value would increase the false negative percentage significantly (i.e. reduce test sensitivity) while having very little effect on the false positive percentage (i.e., no change in test specificity). As a result, VS does not intend to revise the DPP OD cut-off level for any species of cervids in 2016. We will continue to analyze these data to determine if changes are needed in the future.

National Animal Health Monitoring System Cervid Industry Study

Beginning early September 2014, VS, in cooperation with the National Agricultural Statistics Service, conducted the first national study of the U.S. farmed cervid industry. The study surveyed 3,000 producers from all States that have farmed cervids. The survey response rate was 42.5%, which is exceptional for a mail survey. Responses indicate that the U.S. captive cervid population is made up of 65.6% deer operations, 21.2% elk/red deer/sika deer operations, and 13.2% operations with both deer and elk. The study was initiated at the request of industry stakeholders. A report from the study is currently being finalized and should be available in 2015. The survey objectives are based on responses from a needs assessment that was conducted by VS in 2013. The study 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.

Cervid Health Webpage

In 2015, the Cervid Health Team launched a new comprehensive webpage that consolidated all the cervid program disease and other information in one site. In addition to updating existing content, new information was also made available. The new Cervid Health webpage can be found on the APHIS website under the Animal Health and Animal Disease Information links on the left-hand menu.

Cervid Health Program Budget

The Cervid Health Program includes the CWD herd certification program and the cervid TB program. It is funded through the Equine, Cervid, and Small Ruminant Line Item. In FY2015, the Cervid Health Program was appropriated $3.0 million by Congress for cervid health activities. This funding was allocated as follows:

- **Indemnity**−$1.1 million for CWD and cervid TB. (An additional $230,000 was provided to support herd depopulation activities in TX)
- **CWD Research**−$200,000 to support USDA Wildlife Services research for development of CWD live animal diagnostic testing
- **Cervid Health Program**−$1.2 million for general program support (primarily field activities).

APHIS anticipates the FY2016 Cervid Health Program funding will remain at FY2015 levels.

Committee Business:

One resolution was proposed by a committee member titled CHRONIC WASTING DISEASE TESTING PROTOCAL FOR WILD CERVIDAE proposing the United States Animal Health Association (USAHA) urge the USDA to amend CFR 81.3 (b); proposing wild cervids captured for interstate movement and release, have two forms of identification, one of which that is official identification, must be PrP genotyped for Chronic Wasting Disease resistance, tested for Chronic Wasting Disease using a rectal biopsy test. The committee discussed and debated the terms and science related to this resolution proposal including that currently there is no science indicating there are “genotype resistant” cervids to acquiring the CWD prion. The term “resistant” is miss-leading. There are only different cervid genotypes that acquire the infectious prions at different rates and show clinical signs at variable rates, some at prolonged periods after acquiring the prion or they are slow to accumulate detectable levels.. Since all infected animals would be presumed to be capable of shedding the prions into the environment, genotypes with clinical “resistance” or prolonged indication of clinical presentation of the disease, may well potentially be considered prolonged shedders of the prion. Additionally there was discussion put forth by several committee members concerning the lack of regulatory validation of the rectal biopsy test. Also, the test can only be used on young animals and there I significant test sensitivity and specificity variability between cervid species when using this test. A new motion to the proposed resolution was to table this resolution, reword the resolution potentially to be a recommendation for USDA to provide a guidance document to the states for surveillance of CWD on interstate translocations od wild cervids. It was proposed that this new resolution/recommendation be discussed during the Farmed Cervid Subcommittee and forward then to the Captive Wildlfie and Alternative Livestock committee. The motion was proposed by member Charlie Seale and seconded by member Sean Shaffer which was passed by committee.

The Committee on Wildlife Diseases adjourned at 515 PM.