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The Committee met on October 29, 2019 at the Rhode Island Convention Center in Providence, Rhode Island, from 13:04 – 17:30 PM. There were 33 members and 27 guests present. There were no resolutions submitted in 2018. The first presentation was given by Andreas Eleftheriou who was the joint USAHA and American Association of Wildlife Veterinarian's student travel award recipient.
There was no time specific paper presented.

Presentations & Reports:

The Role of Interspecific Competition in the Ecology of Hantavirus, and Their Host, the Deer Mouse

Andreas Eleftheriou, DVM, USAHA and American Association of Wildlife Veterinarians Student Travel Award winner, Wildlife Biology Program, University of Montana, Missoula, MT

(Other authors) Amy Kuenzi, [2]Department of Biology, Montana Tech of the University of Montana, Angela D. Luis, Wildlife Biology Program, University of Montana, Missoula, MT

As species biodiversity declines worldwide, infectious diseases of wildlife and humans are becoming more common. To explain this pattern, the "dilution effect" hypothesis was proposed, which posits that species diversity (i.e. number/evenness of species) can regulate disease risk. However, some claim that species identity is more important than merely species diversity. For example, competition from a dominant species in a given community may alter behavior, and induce chronic stress in another species, which can subsequently influence its exposure and susceptibility to infection, respectively. Chronic stress, typically characterized by a rise in baseline glucocorticoids (GCs), can increase susceptibility to infection through suppression of the immune system.

In western Montana grasslands, small mammal communities consist primarily of deer mice (*Peromyscus maniculatus*), voles (*Microtus* spp.) and shrews (*Sorex* spp.). Deer mice are asymptomatic carriers of Sin Nombre hantavirus (SNV), a directly transmitted pathogen that can cause fatal disease in humans. The deer mouse-SNV system is ideal for examining effects of competition on pathogen transmission because of two reasons. Firstly, voles are dominant competitors of deer mice, so they may influence their behavior, stress physiology, and/or immunity. Secondly, SNV transmission in deer mice increases with higher species diversity, which may be the result of higher intraspecific contact rates (i.e. exposure to infection) and/or higher susceptibility to infection given contact. Thus, we hypothesized that dominant voles will alter contact rates and/or induce stress-mediated immunosuppression in deer mice, while shrews may have a lesser effect.

To address our hypothesis, we live-trapped and marked small mammals over 2 years in western Montana grasslands. Deer mice were evaluated for scar numbers (proxy for contact rates), demography, and body condition scores (BCSs; a measure of stress physiology). We also collected blood and feces from deer mice, and prepared blood smears. To avoid trap-induced effects on baseline GCs, feces were collected within 4 hours of capture. Stress-induced GCs (a measure of stress physiology) were evaluated from feces collected from deer mice confined in a trap overnight. In the laboratory, blood was evaluated for white blood cell counts/differentials, and SNV antibodies, and feces for fecal corticosterone metabolites (FCMs) to measure stress physiology (baseline and stress-induced GCs). To quantify FCMs, we used a corticosterone enzyme immunoassay that was previously validated for use with deer mouse feces. Using mixed effect regression trees, we found that higher vole density was associated with lower scar numbers and BCSs, but that higher shrew density was associated with higher scar numbers, but lower BCSs and stress induced FCMs. We were unable to directly examine relationships between competition and SNV infection because of low numbers of infected deer mice. Overall, our findings suggest that interspecific competition may influence SNV transmission in deer mice via contact rates and stress physiology. Consequently, competition may influence SNV outbreaks and spillover into humans. Hence, identity of species and their ecological roles may be more important in regulating disease risk than solely species diversity.

Pullorum disease testing in endangered species: Challenges and potential impacts

Jessica A. Emerson, DVM, DACZM; White Oak Conservation, Yulee, FL

Pullorum disease, caused by *Salmonella enterica* subspecies *enterica* serovar Gallinarum biovar Pullorum (commonly referred to as *S.* Pullorum), is an important disease in the poultry industry with mortality in commercial operations approaching 100%. Prevention and control of Pullorum disease is primarily achieved through testing and culling, vaccination of chicks, and biosecurity measures. These strategies have been critical in minimizing the risk and consequences of this disease in domestic chickens.

Gallinaceous birds and ratites are common in many zoological collections. Pullorum disease testing is often required in these species prior to movement throughout the US, often employing the same testing methodology of the poultry industry. These methodologies have not been validated in non-domestic avian species and information available at this time indicates that they are not predictive of infection. In endangered species where every individual matters for the future of the population, utilizing appropriate diagnostic tests, understanding results, and minimizing unintended consequences are imperative.

Update on 2019 Hemorrhagic Disease Activity and Asian Longhorned Tick Surveillance

Mark G. Ruder, Southeastern Cooperative Wildlife Disease Study (SCWDS), College of Veterinary Medicine, University of Georgia, Athens, GA

(Other authors) Stacey Vigil, Seth White, Alec Thompson, Natalie Stilwell, Brianna Williams, Rebecca Poulson, Michael Yabsley and David Stallknecht, SCWDS, College of Veterinary Medicine, University of Georgia

In collaboration with the USDA-APHIS-VS and SCWDS member wildlife agencies, SCWDS has been conducting surveys of wildlife for *Haemaphysalis longicornis* (Asian longhorned tick) in the United States. Methods have included 1) live animal trapping and environmental sampling in localized areas where *H. longicornis* has been documented, 2) passive regional surveillance of white-tailed deer and other wildlife, and 3) tick collections from wildlife presented to wildlife rehabilitation facilities in areas where *H. longicornis* has been documented. As of October 25, 2019, we have examined ticks from ~1600 individuals representing 53 species from 21 states resulting in numerous new state, county, and host records. Although the situation is dynamic, to date, these surveys have detected *H. longicornis* in seven states (New Jersey, Maryland, West Virginia, Virginia, North Carolina, Kentucky, and Pennsylvania) on white-tailed deer, raccoons, Virginia opossum, elk, woodchuck, red fox, gray fox, coyote, eastern cottontail, and red-tailed hawk.

Annually, SCWDS processes tissue samples from throughout the United States from wild ruminants with suspected orbiviral hemorrhagic disease. For samples that test positive by RT-PCR, virus isolation is attempted and isolates are identified to serotype. Samples with no virus isolate are not further typed. Findings from the 2018 and 2019 transmission seasons are reported here. During 2018, 102 viruses were detected from 212 tissue samples, representing 6 species of wild ruminant (183 white-tailed deer, 16 mule deer, 10 elk, 1 pronghorn, 1 bighorn sheep, and 1 moose) from 23 states. Isolations of epizootic hemorrhagic disease virus (EHDV)-2 (58), EHDV-6 (1), bluetongue virus (BTV)-1 (1), BTV-18 (1), and BTV-24 (2) were made from white-tailed deer or mule deer (see Table). An additional 25 untyped BTVs were detected in white-tailed deer, mule deer, or elk (FL, GA, ID, MD, MO, MS, NC, NE, PA, and SC), and 14 untyped EHDVs were detected in white-tailed deer, mule deer, or elk (FL, MO, MS, MT, NC, NE, PA, SC, TN, and WV). As of October 24, 2019, 196 viruses have been detected from 316 tissue samples, representing 25 states and 5 species (293 white-tailed deer, 9 mule deer, 8 elk, 4 pronghorn, and 2 cattle). To date, isolations of EHDV-1 (1), EHDV-2 (126), and BTV-2 (1) were made from white-tailed deer, pronghorn, or cattle (see Table). An additional 16 untyped BTVs have been detected in white-tailed deer (AR, FL, GA, NC, NE, PA, and WV) and 52 untyped EHDVs have been detected in white-tailed deer, mule deer, or elk (AR, FL, GA, ID, IN, KS, KY, MO, NC, WI, and WV).

2018 SCWDS EHDV & BTV Diagnostics
Virus Serotypes Detected

STATE	SPECIES	VIRUS
Florida	white-tailed deer	EHDV-2
		BTV-18
		BTV-24
Georgia	white-tailed deer	EHDV-2
Idaho	white-tailed deer	EHDV-2

Kansas	white-tailed deer	EHDV-2
Kentucky	white-tailed deer	EHDV-2
		EHDV-6
Louisiana	white-tailed deer	EHDV-2
Missouri	white-tailed deer	EHDV-2
Mississippi	white-tailed deer	EHDV-2
Montana	mule deer	EHDV-2
North Carolina	white-tailed deer	EHDV-2
North Dakota	white-tailed deer	EHDV-2
	mule deer	EHDV-2
Nebraska	mule deer	EHDV-2
Pennsylvania	white-tailed deer	EHDV-2
West Virginia	white-tailed deer	EHDV-2
		BTV-1

2019 SCWDS EHDV & BTV Diagnostics

Virus Serotypes Detected

as of October 24, 2019

STATE	SPECIES	VIRUS
Alabama	white-tailed deer	EHDV-2
Arkansas	white-tailed deer	EHDV-2
Georgia	white-tailed deer	EHDV-1
		BTV-2
Idaho	white-tailed deer	EHDV-2
	pronghorn	EHDV-2
Indiana	white-tailed deer	EHDV-2
Kansas	white-tailed deer	EHDV-2
Kentucky	white-tailed deer	EHDV-2
Louisiana	white-tailed deer	EHDV-2
Missouri	white-tailed deer	EHDV-2
North Carolina	white-tailed deer	EHDV-2
North Dakota	white-tailed deer	EHDV-2
Virginia	white-tailed deer	EHDV-2
Wisconsin	white-tailed deer	EHDV-2
West Virginia	white-tailed deer	EHDV-2
	cattle	EHDV-2

Update from the OIE National Focal Point for Wildlife and the OIE Working Group on Wildlife

Jonathan Sleeman, National Wildlife Health Center, United States Geological Survey, Madison, WI

The need to fight animal diseases at global level led to the creation of the Office International des Epizooties (World Organization of Animal Health; OIE) through an international agreement signed in 1924. The OIE is the intergovernmental organization responsible for improving animal health worldwide with 182 Member Countries and regional offices on every continent. The OIE recognizes the threats to public, animal and environmental health from wildlife diseases and encourages all countries to increase capacity to conduct surveillance, early detection, and initiate appropriate response to outbreaks and spread of diseases in wildlife. Activities of the OIE related to wildlife diseases include a Working Group on Wildlife of scientific experts, development of science-based standards related to disease risks at the wildlife, domestic animal, and human interface, support to Member Countries to protect animal health including wildlife and biodiversity, and surveillance and notification of wildlife diseases through the global OIE information system WAHIS-Wild. Each Member Country is encouraged to appoint a National Focal Point for Wildlife (NFW) with several responsibilities, including:

1. establish a network of wildlife experts within his/her country or to communicate with the existing network, and to facilitate communication among several authorities where responsibility is shared;
2. under the authority of the OIE Delegate of his/her country, to support the optimal collection and submission of wildlife disease information to the OIE through WAHIS-Wild.

Specifically, there are approximately 50 non-OIE listed wildlife diseases of interest (http://www.oie.int/wahis_2/public/wahidwild.php/Diseaseinformation/popup/diseaselist) and the NFW is responsible for submission of the annual voluntary report for wildlife to OIE concerning detections of these diseases. Reporting of wildlife diseases is important to build situational awareness regarding wildlife health, build national knowledge capacity, increase coordination among agencies, and integrate wildlife health into other surveillance frameworks. Reports of a detection of a wildlife disease of interest in the United States can be submitted via the U.S. National Focal Point for Wildlife, Dr. Jonathan Sleeman (Center Director, USGS, National Wildlife Health Center, Madison, WI 53711, Tel: (608) 270 2401;
Email: jsleeman@usgs.gov). Alternatively, reports can be submitted via WHISPers (https://www.usgs.gov/centers/nwhc/science/whispers) which is partner-driven, web-based tool for sharing information about historic and ongoing wildlife mortality and morbidity events. WHISPers provides natural resource management partners and the public with timely, accurate information on where wildlifedisease events are occurring or have occurred for better preparation and decision making. The recently redeveloped WHISPers portal allows partners to directly enter event information for real-time display and to share information with colleagues within and across agencies for better communication and event response coordination.

Changes in chronic wasting disease ecology in elk at Rocky Mountain National Park

Jenny G. Powers, DVM, Director National Park Service, Biological Resources Division

(Other authors) Nathan L. Galloway, National Park Service, Biological Resources Division, Ryan J. Monello, National Park Service, Inventory and Monitoring Program, Pacific Island Network, Margaret A. Wild, Washington State University, Department of Veterinary Microbiology and Pathology

We conducted two key studies at Rocky Mountain National Park, Colorado, to investigate the population-level effects of chronic wasting disease (CWD) in elk with historically high densities (up to 110 elk/km^2 on portions of the winter range). CWD was first detected in this population in 1981 and by the early 2000s half of the adult elk found dead tested positive for CWD. We estimated disease prevalence of ~13% (8-19%; n=136) in adult females in 2008. Additionally, we estimated that the population growth rate in female elk was flat (λ~1.0) and that CWD can reduce adult female survival and decrease population growth of elk (Monello et al. Journal of Wildlife Management, 2014). In a subsequent study, we are investigating disease dynamics in the elk population and monitoring changes in disease transmission pressure associated with locally specific reduced elk density and increased elk dispersion. We have a preliminary estimate of prevalence for 2012-2016 of ~8.5% (4.6-13.3%; n=138). Results corroborate that CWD reduces adult female elk survival and this increased mortality decreases the population growth rate. Concurrent with our study, elk are re-distributing to lower elevations outside of the park, where CWD prevalence has always been lower, resulting in much lower densities within the park. The effects of this on CWD prevalence are unclear; movement may simply spatially dilute disease across the landscape or lower densities may reduce disease transmission.

Bovine Tuberculosis in Indiana: An Update from the Wildlife Perspective

Nancy Boedeker, Wildlife Veterinarian, Indiana Department of Wildlife

In response to bovine tuberculosis identified in farmed deer and cattle, the Indiana Department of Natural Resources (DNR) began surveillance for the disease in hunter-harvested deer in 2009. Between 2009 and 2015, the DNR submitted samples from 1415 hunter-harvested deer from the surveillance zones in the southeastern part of the state and all tested negative. Although expecting to stop testing deer in 2015, due to the detection of bovine tuberculosis on additional southeastern Indiana farms in 2016, the DNR instead intensified testing, with 2270 hunter-harvested deer submitted for surveillance during the next two hunting seasons (2016-17, 2017-18). Additionally, wildlife samples (deer and mesocarnivores) were collected by USDA-APHIS Wildlife Services from affected premises and submitted for testing. A single wild deer and 3 raccoons collected directly from affected premises between 2016 and 2019 were positive for *Mycobacterium bovis*, with whole genome sequencing strongly suggestive of transmission from livestock to wildlife. An additional 89 hunter-harvested and targeted wild deer were submitted by the DNR during the 2018-2019 hunting season. All hunter-harvested deer from Indiana have tested negative for bovine tuberculosis. There is no evidence that bovine tuberculosis is established in wildlife populations in Indiana. Continued vigilance is recommended with testing of additional wildlife from the most recently affected cattle farm (depopulated in August 2018) under consideration for the spring and fall of 2020. The DNR remains committed to supporting state and federal partners in maintaining the eradication of bovine tuberculosis from Indiana.

Ante-mortem Chronic Wasting Disease Testing Cervids in Texas

Bob Dittmar DVM, Wildlife Veterinarian, Texas Parks and Wildlife Department

Ante-mortem testing for chronic wasting disease (CWD) in Texas is being used to increase surveillance for CWD in captive facilities for intrastate movement of deer. To date over 34,000 samples from almost 33,000 animals have been tested. Of those, a few over 4,700 were subsequently tested after death and 85 of those were determined to be positive on postmortem tests. Analysis of the number and types of ante-mortem tests, length of time from ante-mortem testing to postmortem testing and comparative sensitivity is ongoing. Ante-mortem sampling is used to upgrade status for movement, substitute for missing mortalities and evaluate disease presence in positive facilities. Medial retropharyngeal lymph node (MRLN), recto-anal mucosa

associated lymphoid tissue (RMALT), and tonsil biopsies are the tissues sampled, with rectal providing most samples. Age of the animal, biopsy size and operator expertise are factors in limiting inconclusive results. Ante-mortem testing is a useful tool to increase surveillance for CWD on a herd level basis.

Annual Update from the Cervid Health Team Fiscal Year (FY) 2019

Tracy Nichols, Staff Scientist, Cervid Health Program, USDA APHIS Veterinary Services, Ft. Collins, CO

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, herds participating in the HCP 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 farmed cervids from enrolled herds certified as low risk for CWD may move interstate. Currently, 28 States participate in the voluntary CWD Herd Certification Program and have Approved HCPs. FY 2019 marks the seventh year that Approved States have submitted their CWD HCP annual reports to APHIS. In FY 2019 there were 2,192 enrolled cervidae herds: 1,696 deer, 361 elk and 135 mixed species herds. Of those, there were 1,748 certified cervidae herds: 1,337 deer, 314 elk and 97 mixed species herds.

CWD in Farmed Cervids

Summary of CWD detections. As of September 30, 2019, CWD has been confirmed in wild deer and elk in 23 U.S. States, and in farmed cervids in 17 States. In total, 26 States have identified CWD in wild and/or farmed cervids. CWD has been reported in 117 farmed cervid herds in the United States.

FY 2019 CWD Detections in Farmed Cervids: Seventeen newly identified CWD positive farmed cervid herds were identified in FY 2019 (9 white-tailed deer, 6 elk, and 2 mixed herds). Twelve herds were within 20 miles of confirmed CWD positives in the wild.

Pennsylvania:

November 2018: NVSL confirmed CWD in a three-and-a-half-year-old white-tailed doe in Fulton County. The doe was a natural addition to the 23 head breeding deer herd that sits within a half mile of where CWD has been identified in the wild. This herd was not enrolled in the HCP and was depopulated with Federal funds in April of 2019. All 23 depopulated animals were found to be CWD positive.

January 2019: NVSL confirmed CWD in a three-and-a-half-year-old white-tailed buck in Clearfield County. The buck was a purchased addition to a hunt preserve of 12 white-tailed deer

that was not a participant in the Federal HCP. This animal resided on the preserve four days before being hunted. The animal was traced back to an HCP-certified breeding herd in Fulton County within a CWD-endemic area. This breeding herd consisted of 137 white-tailed deer and was depopulated in May 2019 with Federal indemnity. There were 27 additional positives identified at depopulation.

April 2019: NVSL confirmed CWD in one three and one four-year-old white-tailed doe in a breeding herd in Fulton County in a CWD-endemic area. The herd consists of 12 white-tailed deer and is not enrolled in the Federal HCP. The herd is under quarantine and the owner will depopulate.

May 2019: NVSL confirmed CWD in a two-and-a-half-year-old white-tailed buck in Fulton County. The buck was a natural addition to the 320 head breeding deer herd that lies within a CWD-endemic area. This herd was not enrolled in the Federal HCP and is under quarantine. To date, eight additional CWD-positive animals have been identified from this herd.

June 2019: NVSL confirmed CWD in a six-year-old white-tailed doe in Perry County. The doe was a natural addition to the 222 head breeding deer herd that lies within a CWD-endemic area. This herd was double fenced and certified in the Federal HCP. It is currently under quarantine.

Wisconsin:

January 2019: NVSL confirmed CWD in a six-year-old white-tailed buck in a Forrest County hunt preserve. This herd was already under a trace quarantine from a breeding facility in Marinette County in FY18 and is not enrolled in the Federal HCP. This hunt preserve consists of approximately 399 animals, is not in a CWD endemic area, and remains under quarantine.

June 2019: NVSL confirmed CWD in a two-and-a-half-year-old white-tailed buck in Portage County. The buck was a purchased addition to a hunt preserve of 151 white-tailed deer not enrolled in the Federal HCP. CWD has been detected 11 miles from this site. The index animal resided there for five days prior to being harvested. This herd was depopulated with State indemnity and no additional positive cases were found. The source herd for the index animal was a double-fenced, federally certified HCP breeding herd within a CWD-endemic area consisting of 42 white-tailed deer. The herd was depopulated with Federal funds. An additional six CWD-positive animals were identified at depopulation.

August 2019: NVSL confirmed CWD in a six-year-old elk bull in in Burnette County. The bull was a purchased addition to a small breeding herd of five elk five years prior to CWD detection. The herd is certified in the Federal HCP, within an area endemic for CWD, and is currently under quarantine.

South Dakota:

January 2019: NVSL confirmed CWD in a two-year-old elk cow in Clark County. The cow was a purchased addition to the herd, which was certified in the Federal HCP. The herd consisted of 18 animals and was depopulated with Federal funds in October 2019. CWD test results are pending. CWD has not been identified in the wild in this area. The source herd for this animal was in Meade County certified in the Federal HCP. CWD was identified in a seven-year-old bull and an eight-year-old cow elk in September 2019. This herd consisted of five animals, was not in a CWD-endemic area, and was depopulated with Federal funds in October 2019. CWD test results are pending.

Colorado:

October 2018: NVSL confirmed CWD in a seven-year-old cow elk from a hunt preserve in Mesa County. The bull was a purchased addition and was moved into a pasture that had previously contained CWD-positive animals. This herd is certified in the Federal HCP certified, consists of 191 animals, and remains under quarantine.

November 2018: NVSL confirmed CWD in a one-and-a-half-year-old elk bull in Jackson County. The bull was a natural addition to the herd which is certified in the Federal HCP and consists of 42 animals within a CWD-endemic area. This herd is under quarantine.

Michigan:

September 2019: NVSL confirmed CWD in a two-year-old female white-tailed deer in Montcalm County. The doe was a natural addition to the breeding herd which consists of 50 white-tailed deer. This herd is not enrolled in the Federal HCP, is within a CWD-endemic area, and is under quarantine.

Nebraska:

September 2019: NVSL confirmed CWD in a five-year-old elk cow in Buffalo County. The cow was a purchase addition to the herd in 2018. This is a breeding herd of 48 elk, and it is not enrolled in the Federal HCP. The herd is currently under quarantine and is not in an area where CWD has been identified. The source herd of this animal was an HCP-certified herd in Lincoln County, Oklahoma.

Oklahoma:

April 2019: NVSL confirmed CWD in a two-year-old elk bull in and in a two-year-old elk cow in May 2019 in Lincoln County. Both were natural additions to the herd. This herd was certified in the Federal HCP and consisted of 246 elk in the breeding area, and more than 50 in the hunt preserve. Animals in the breeding facility and hunt preserve were depopulated with Federal funds in August and September 2019. No additional CWD positive animals were identified.

Cervid Health Program Staffing

The USDA APHIS Cervid Health Program (CHP) has undergone some organizational and staffing changes in FY19. Small ruminant health programs including CHP are now a part of the Ruminant Health Center under the direction of Dr. Alecia Naugle. Dr. Diane Sutton is the Ruminant Health Center Assistant Director for small ruminant health programs. Dr. Nancy Hannaway is no longer with the CHP and Drs. Byron Schick and Tracy Nichols are the current CHP points of contact. Dr. Nichols is primary for CWD policy, research coordination and tissue archive. Dr. Schick is primary for cervid indemnity, cervid TB and brucellosis policy, and CWD annual reporting.

CWD Program Standards

The CWD Program Standards were published and took effect in May 2019. A webinar highlighting the most significant changes was presented to State Animal Health officials to clarify important aspects of the standards such as consequences of poor quality and missing samples, ante mortem diagnostics, sample collection and submission, epidemiological investigations, indemnity, and biosecurity. This webinar, and others related to the revised Program Standards, can be found on the Cervid Health Webpage (www.aphis.usda.gov/animalhealth/cervid) on the CWD Herd Certification Program page linked from the CWD Section. Additionally, the Cervid Health Program continues to address topics

related to the changes in the Program Standards on monthly calls with State Animal Health officials to allow for questions and clarifications.

CWD Research and the Cervid Health Program

Determination of the predictive value of whole genome markers: USDA APHIS initiated, and then collaborated with Texas Parks and Wildlife, on a study with Texas A&M University geneticist Dr. Christopher Seabury to evaluate the white-tailed deer genome for genetic markers that might influence susceptibility to CWD. Dr. Seabury identified a suite of genes (inside and outside of the prion gene) that appear to predict the susceptibility of WTD to CWD with greater than 80% accuracy. The study will be submitted for scientific peer review shortly. Based on the preliminary findings from this initial study, APHIS and Texas Parks and Wildlife have provided funding to validate the predictive model and will provide additional samples to better inform the model for potential use in the future.

Evaluation of RT-QuIC assay on targeted ante and postmortem tissue samples: The RT-QuIC amplification assay has been demonstrated by numerous scientific studies to be a highly sensitive tool for the detection of CWD. There is increased interest by both the cervid industry and wildlife managers to develop more sensitive ante and postmortem CWD diagnostic tools. This topic was also identified as one of the top five most important CWD research targets at the 2019 CWD Research Consortium hosted by Michigan State University. Dr. Nichols from the APHIS Cervid Health Program is a member of this consortium and is collaborating with the USDA Agricultural Research Service (ARS) in Pullman, WA, and USGS National Wildlife Health Center in Madison, WI to evaluate RT-QuIC CWD detection sensitivity and specificity on retropharyngeal lymph node, as tonsil and rectal biopsy.

TB in Farmed Cervids

Annual TB Surveillance Summary

In FY 2019, 10,285 cervids were tested for bovine TB using the DPP serologic test and 2,658 cervids were tested using the single cervical test (SCT).

The primary DPP serological testing identified 27 TB suspects (0.26%); 12 of these animals tested negative, 9 tested positive on the re-test at least 30 days later and were classified reactor, and 3 were euthanized without a 2nd DPP. Three animals are pending retest. From the 9 reactors, 8 cultured negative for *M*. *bovis* and one animal is pending necropsy.

The SCT test identified 41 responders (1.54%). All responders were retested with the Comparative Cervical Test and were found negative.

Cervid TB: DPP evaluation in Mule and Sika Deer

On October 1, 2018, Veterinary Services initiated a pilot project to evaluate the Dual Path Platform (DPP) test in Mule and Sika deer.

The Center for Veterinary Biologics (CVB) licensed the DPP in 2012 as a primary test for elk, red deer, white-tailed deer, and fallow deer. Veterinary Services approved the DPP for official TB program tests in cervid species for elk, red deer, white-tailed deer, fallow deer and reindeer.

The DPP has been widely accepted in the cervid industry. The test has demonstrated sufficient sensitivity and specificity in the species for which it is approved. The advantage of the serologic test is that it requires only one capture event; thereby, reducing the potential for injury and improving animal welfare. Cervid industry representatives have identified the evaluation of the DPP for use in mule deer and sika deer as a priority.

The DPP will be evaluated as a primary and secondary test for TB in Mule and Sika deer. The project will utilize serum samples submitted by designated accredited veterinarians for herd TB certification purposes. Samples will be collected and submitted in a manner consistent with the requirements of Veterinary Services Guidance 6701.3 and will be considered Official cervid TB tests.

The project will end for each species when a sample size target of 306 individual animals has been reached. The project for Mule and Sika DPP validation will occur concurrently. As of September 30, 2019, VS NVSL has processed 10 samples for Mule deer and 0 samples for Sika deer.

Industry representatives have indicated the use of the DPP will likely increase in Mule and Sika deer over the next two years as herds rotate through the 36-month herd accreditation interval.

Association of Fish & Wildlife Agencies CWD Updates: Additional BMPs, State Surveillance and Management Survey, and Diagnostic Laboratory Capacity Survey

Jonathan Mawdsley, Association of Fish and Wildlife Agencies, Washington, D.C.

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Additional Best Management Practices for Chronic Wasting Disease

The Association of Fish and Wildlife Agencies (AFWA) had developed an initial set of best management practices for prevention, surveillance, and management of CWD in 2017-2018. These practices were endorsed by AFWA's Fish and Wildlife Health Committee and the Directors in September, 2018. The approved version of these BMPs and the accompanying technical report have been posted on committee's website.

The intent of the Association is for this to be a "living document" to track new developments in science, management of this disease. Subsequent to the development and approval of the original BMPs, several topics identified as high priorities by state wildlife agencies and partners.

Four topics were selected by the AFWA Fish and Wildlife Health Committee for development of new best management practices: taxidermy and meat processing; facilities quarantine; Inter-state / Inter-provincial notification of positive testing results; and responding to hunter inquiries re: testing of animals. The Association convened over thirty wildlife disease experts, veterinarians, academics, state and federal agency biologists to write, edit, and review these new practices. Drafts of the practices were circulated to state wildlife agency directors and wildlife chiefs for review. The practices were presented in September, 2019, at the AFWA Annual Meeting where they were approved by the AFWA Directors. The final approved texts of

these practices is available for download on the AFWA Fish and Wildlife Health Committee's website: https://www.fishwildlife.org/afwa-acts/afwa-committees/fish-wildlife-health-committee

AFWA State CWD Needs Survey

At the Association we have heard anecdotal information from state wildlife agency staff indicating that states are seeing significant increases in expenditures related to the prevention, surveillance, and management of CWD. States are improving their surveillance efforts and there is also increased hunter demand for testing, particularly in response to recent recommendations from the U. S. Centers for Disease Control and Prevention.

AFWA staff surveyed the state fish and wildlife agencies in 2017 and again in 2019 to determine current and anticipated expenditures on CWD testing and management. In 2019, thirty states responded, including all states with CWD-positive wild deer. Key findings include:

- State agencies are spending $14.3 million this year on testing; at least 159,000 animals will be or are being tested this year (average of 5,600 animals/state reporting).
- There is a dramatic increase in testing demand: average expected increase of 32% in number of animals tested between this year and next, across all states.
- State agencies anticipate spending $84 million on CWD testing over next five years.
- State spending on prevention and management is roughly equivalent to expenditures on testing; $13 million in 2019 alone.
- Common management activities reported by multiple states include: development and revision of CWD management plans; interagency coordination among state, federal, and local government partners; communications among partners, with hunters, and with the general public; review of regulations; and also targeted research to answer high-priority management questions.

NAHLN Lab Survey: Chronic Wasting Disease Capacity and Needs

At the Association we have heard significant concerns from multiple states regarding existing capacity for CWD testing and anecdotal information about the lack of testing capacity, shortages of key testing resources, and staffing shortages at the existing testing labs. Working collaboratively with the Cornell Wildlife Health Lab, we reached out to the 28 NAHLN approved labs to obtain information about laboratory testing capacity. Twenty-two of the 28 NAHLN-approved labs participated in the survey. Six of these labs use IHC only, eight labs use ELISA only, and eight use IHC and ELISA.

With regards to IHC testing, multiple concerns were raised by respondents. Four labs will need to replace all of their testing equipment due to the loss of approval for the BioCare testing platform. Labs also report issues with availability of reagents for the other two approved testing platforms, Leica and Ventana. Issues were also reported with regards to pricing of reagents and the phasing out of maintenance contracts for older equipment. Four labs report that they have difficulty having enough people to do testing; one lab runs samples once a week to maintain efficiency, but this prolongs turn-around time; and one lab does not have enough pathologists to support testing by reading the slides. Seven of the labs performing IHC expressed the desire to double their testing capacity, five would like for their capacity to remain the same, and one lab has expressed the opinion that IHC should only be confirmatory and thus, would like IHC testing to decrease in that lab.

With regards to ELISA testing, all 16 labs performing this testing use the BioRad equipment, and two labs also use the IDEXX equipment. The age of the equipment ranges from one to nine plus years, two labs report that they will be replacing equipment in the next two years, and one lab expressed the possibility of needing additional equipment if testing demand continues to increase. Nine of the 16 labs reported issues with the availability of BioRad testing kits, resulting in delays in testing. Nine of the 16 labs reported difficulties in having enough staff to support testing, because it is a seasonal job (with highest demand during hunting season).

Additional concerns expressed by labs in regards to ELISA testing include:

- General concern for availability of replacement equipment.
- Bio-Rad equipment needs to be repaired fairly regularly.
- Annual service contract plan is expensive.
- Repairs do not happen in a timely manner.
- Short expiration dates on the kits which becomes a problem in the off season.
- The two-plate kit is inconvenient for labs with large numbers of samples.
- Bio-Rad is not updating their operating system for new versions of Windows; this presents challenges when the lab has to go to a new computer system.
- Desire for automated instrument for the detection part of the assay – currently available and in use in Europe.
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Six of 16 labs would like to increase their testing capacity; the remaining labs would like their capacity to remain the same. Thirteen of 16 labs would be interested in running the IDEXX ELISA if it was approved for captive cervids.

Fifteen of 21 labs test samples directly for hunters. At two labs, the state pays the fee; at the other 13, the hunter pays the fee. Prices range from $0 to $80 per test with an average of $48 per test. At some labs, the cost depends on in-state versus out-of-state and whether the whole head or just the sampled tissues are received.

Twenty of 22 labs said that they would be interested in using RT-QuIC testing technology if it were approved for CWD testing. Many of these labs stipulated that the switch would be dependent on NAHLN approval, affordable pricing for the equipment, and that the appropriate specificity and sensitivity could be achieved. Five of these labs expressed that they did not know a lot about this platform but were interested in learning more. One of the two labs that was not interested in RT-QuIC expressed concern that laboratory contamination would be a major issue in endemic states. The other lab that was not interested said that additional research would be required before they would be willing to move away from the current standard for CWD testing across the country.

Potential Use of Detection Dogs in Detecting and Managing Diseases in Wildlife and the Environment

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Recent avian influenza outbreaks have resulted in global biosecurity and economic concerns. Monitoring can be complicated because primary reservoirs are often asymptomatic for the disease and can potentially spread the influenza virus along migratory bird flyways. In a previous study, trained mice correctly discriminated the health status of individual ducks on the

basis of fecal odors when feces from post-infection periods were paired with feces from pre-infection periods. Chemical analyses indicated that avian influenza infection was associated with a marked increase of acetoin (3-hydroxy-2-butanone) in feces. This was followed by a study with domesticated male ferrets (*Mustela putorius furo*) trained to display a specific conditioned response (i.e. active scratch alert) in response to a marked increase of acetoin. Ferrets rapidly generalized this learned response to the odor of feces from infected mallards. More recently, six dogs have been similarly trained to identify avian influenza infection via olfactory cues found in feces. These results bolster the assertion that trained mammalian biosensors should be employed in an avian influenza surveillance program.

Committee Business:

Two resolutions were presented, discussed and approved. The first requested USDA/APHIS to consider validating the use of amplification assays for the detection of chronic wasting disease and the second the Department of the Interior to prioritize the identification of resources to support the proposed facility updates the USGS National Wildlife Health Center Laboratory Facilities