REPORT OF THE COMMITTEE ON BRUCELLOSIS

Chair: Glenn E. Plumb, WY
Vice Chair: Jim R. Logan, WY

The Committee met on October 12, 2009 from 1:00-4:30 p.m. and October 13, 2009 from 8:00-11:30 a.m. at the Town and Country Hotel, San Diego, Calif. There were 50 members and 52 guests present. The meeting was chaired by Dr. Glenn Plumb, and there were ten scientific presentations and reports, a panel dialogue on the future of the U.S. Brucellosis Program, and five resolutions presented to the Committee for consideration. Dr. Jim Logan, Vice-Chair, gave a brief review of the 2008 meeting in Greensboro, North Carolina, and reported on two resolutions from that meeting. The response from United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) to both was positive.

The Committee received reports from the following three subcommittees, which are included at the end of this report:

- Report of the Scientific Advisory Subcommittee on Brucellosis;
- Report of the Feral Swine Subcommittee on Brucellosis and Psuedorabies; and
- Report on the Subcommittee on Brucellosis in the Greater Yellowstone Area.

FY09 US Cooperative Brucellosis Eradication Program was presented by Dr. Debra Donch, APHIS-VS.

The Future of the US Brucellosis Program
Dr. LeeAnn Thomas, APHIS-VS

The cooperative Federal-State-industry effort to eradicate brucellosis (*Brucella abortus*) from cattle in the United States has made significant progress since the program's inception in 1934. In 2008 and once again in July 2010 all States were recognized as Class-Free (i.e. disease free status). However, unique challenges remain in the form of a surveillance system that uses redundant surveillance streams where slaughter stream samples are tested with multiple testing protocols; a time consuming and rigid regulatory process; a costly and inflexible State-based status classification system; a continued foci of endemic disease in bison and elk in the Greater Yellowstone Area; and the implementation of more stringent interstate movement requirements when States impose more stringent requirements on states with affected herds. Veterinary Services' (VS) developed a concept paper that has been made available for public comment in the Federal Register that describes our approach to addressing these challenges that included specific input from the GYA States. The concept paper provides an action plan that: Effectively demonstrates the disease-free status of the United States through a national status-based program supported by a national surveillance strategy, Enhances efforts to mitigate disease transmission from wildlife, Enhances disease response and control measures, Modernizes the regulatory framework to allow VS to address risks quickly and sensibly, and Implements a risk-based disease management area concept. To succeed, this new approach will require VS' continued partnership with State animal health and wildlife officials, other Federal agencies, industry, international partners, academia, and other stakeholders. Successful partnerships will allow us to use available resources efficiently to achieve program objectives and protect our national livestock herd. This action plan will benefit Federal and State animal health officials, the regulated industries, and producers by allowing a more adaptable science-based response that is both effective and timely and that addresses the unique challenges facing the program today. Copies of the action paper have been made available at this meeting today for your review and comments.

Carrying capacity of Yellowstone bison: implications for conservation and brucellosis management

Glenn Plumb, National Park Service

(Excerpted from: Plumb, GE, PJ White, MB Coughenour, and RL Wallen. 2009. Carrying capacity, migration, and dispersal in Yellowstone bison. Biological Conservation 142:2377-2387) Yellowstone bison historically occupied approximately 20,000 km^2 in the headwaters of the Yellowstone and Madison rivers in what is now referred to as the northern Greater Yellowstone Area. However, by the early 20th century, Yellowstone National Park (YELL) provided sanctuary to approximately two dozen of the only relict, wild and free-ranging bison remaining in the United States. The successful conservation of this bison population to a high near 5,000 animals in 2005 is a conservation epic that has led to an enduring series of societal conflicts and disagreements among various publics and management entities regarding issues of perceived overabundance and the potential transmission of the *Brucella abortus* pathogen to domestic cattle. Park ungulate management policies evolved in 1969 to preclude deliberate culling inside the park and allow ungulate abundance to fluctuate in response to weather, predators, resource limitations, and outside-the-park hunting and land uses. Bison numbers increased rapidly under this policy and, since the 1980s, increasing numbers have moved outside the park during winter where some have been culled by state and federal agencies. These movements and removals led to loosely extrapolated claims that bison were overabundant and had degraded their range. Such claims, in turn, have led to calls for intensive management to limit the abundance and distribution of bison, including fencing, fertility control, hunting, and brucellosis test-and-slaughter programs. Central to this debate is whether bison move outside the park because their abundance has surpassed levels that can be supported by the park's forage base, and the implications of disease and perceived overabundance for long-term bison conservation.

The park encompasses 9,018 km^2 in the western United States, including portions of Idaho, Montana, and Wyoming. The bison population consists of central and northern herds that occupy ranges of approximately 1200 km^2, respectively, with variable plant communities and precipitation patterns along a decreasing elevation gradient (2,400 to 1,600 m). Winters are severe, with snow-water equivalents averaging 35 cm and temperatures reaching -42 C, though windswept areas in the upper portions of the Hayden Valley and patchily distributed geothermal areas reduce snow cover and costs for accessing food, traveling, and thermoregulation. The bison population is chronically exposed and infected with *Brucella abortus*. Since the initial detection of this non-native pathogen in Yellowstone bison in 1917, with transmission presumably from infected livestock, up to 60% of this population has tested positive for anti-bodies indicating exposure to the brucellosis pathogen. However, only about one-half of these test-positive bison are likely infected. To manage the risk of brucellosis transmission from Yellowstone bison to cattle, the federal government and State of Montana agreed to the Interagency Bison Management Plan (IBMP) in 2000. This plan established guidelines for implementing hazing, test-and-slaughter, hunting, and other actions affecting bison near the park boundary. The IBMP established a primary conservation area of approximately 9,050 km^2 for the bison population that includes all of YELL and several zones of intensive, adaptive management outside the northern and western boundaries of the park where limited numbers of bison are allowed under various contingencies.

Admittedly, the term *carrying capacity* is one of the most common and confusing terms used in wildlife management because it denotes a variety of meanings. *Ecological carrying capacity* has been defined as the natural limit of a population set by resources in a particular environment, or an equilibrium represented by *K* of the logistic equation, that populations tend towards via density-dependent effects from lack of food, space, cover, or other resources. Ecological carrying capacity is often simplified to the number of herbivores in dynamic equilibrium with the forage base (i.e., food-limited carrying capacity). Coughenour recently evaluated if Yellowstone bison had reached a food-limited carrying capacity by parameterizing and testing a spatially-explicit ecosystem model for the YELL ecosystem that integrated data from site water balance, plant biomass production, plant population dynamics, litter decomposition and nitrogen cycling, ungulate herbivory, ungulate spatial distribution, ungulate energy balance, ungulate population dynamics, predation, and predator population dynamics submodels. The model simulated the central and northern bison herds, as well as two resident wintering elk herds and summer immigrant elk. When the model was run for 50 years without management removals or migrations outside the park, the northern herd displayed a mean of 2,400 bison, and the central herd displayed a mean of 3,800 bison, for a total of 6,200. The actual maximum total count of Yellowstone bison within a year was 3,531 bison in the central herd and 1,484 bison in the northern herd, for a total of approximately 5,000 during summer 2005, with an estimated sightability of 0.97. Thus, neither the central or northern bison herds have exceeded their estimated mean food-limited carrying capacities in the park, though simulations suggest there should be extensive inter-annual variations in estimated carrying capacity due to variations in weather, forage availability, competition, and other factors.

Seasonal bison movements between central ranges, and movements to lower-elevation winter ranges along the boundary of began when population size increased above 1,500 for the central herd and 550 for the northern herd. These thresholds are well below estimates of food-limited carrying capacity. Thus, bison left the park during winter even though their theoretical food-limiting carrying capacity has not been reached, suggesting that density-dependent and independent mechanisms interacted to induce movements. As bison numbers approach a theoretical food-limited carrying capacity, decreasing body condition and vital rates are indications of nutritional stress, suggestive of competition for food supplies, even though total forage is not deleted. Furthermore, as snow depth increases, the available foraging area is reduced to increasingly limited areas at lower elevations and on thermally warmed ground. Residence times in foraging areas is negatively correlated with bison numbers, suggesting that competition increased in high-quality foraging areas as more bison migrate onto the winter range and, in turn, bison travel and redistribution increases. Though bison appear to respond to fine-scale changes in food availability, they also operate at larger scales through migration and dispersal. Migration is defined as movement from one spatial unit to another, with a return component, and conversely, dispersal is defined as movement from one spatial unit to another, without return (at least in the short term). Increases in winter range areas used by the central and northern herds have been characterized as range expansion (i.e., dispersal), even though bison returned to traditional summer ranges in the park (i.e., migration). Several authors have conclude that movements within and outside the park likely enabled bison to maintain relatively stable instantaneous densities (i.e., density equalization) during winter as population size increased. Increases in winter range areas from mid-1980s onwards thus contributed to increased population growth in both herds, and ecological carrying capacity increased once new ranges were found; creating a positive feedback cycle. The effects of road grooming for over-snow vehicle recreation on the demography and movements of bison in the central portion of the park during winter have been debated since the early 1990s. Meagher expressed concern that energy saved by bison traveling on packed snow resulted in enhanced survival and population growth and, in turn, increased movements to boundary areas. Others have concluded that, despite intensive monitoring, that there is no evidence that bison preferentially used groomed roads in central YELL during winter. Bison movements and the spatial distribution of travel corridors are primarily controlled by topographic and habitat attributes such as slope, landscape roughness, habitat, foraging areas, with streams the most influential landscape feature affecting the bison winter travel network. Bison thus move beyond park boundaries in winter in response to interactions between population density, variable forage production driven by growing season precipitation, snow conditions, and competition between bison and elk. During spring, bison also redistribute to obtain green forage at lower elevations in and outside the park, while upper-elevation portions of the winter range are still covered with snow.

Yellowstone bison have not exceeded estimates of their theoretical food-limited carrying capacity in YELL, but began to migrate to lower elevations in or outside the park during winter as numbers increased and climatic factors (i.e., snow, drought) interacted with density to limit nutritional intake and foraging efficiency. This behavioral response has enabled bison to maintain relatively stable population growth and increase their food-limited carrying capacity as numbers increased. These findings suggest the concept of food-limited carrying capacity is somewhat different for Yellowstone bison because decreased intake or foraging efficiency induces distant movements well below ecological carrying capacity and large-scale starvation of animals. This behavioral response at a lower threshold likely represents the "nutritional" or "foraging efficiency" carrying capacity for bison when intake rates are not meeting their needs or expectations. Bison occupying the Yellowstone and Madison River watersheds historically operated at a scale larger than YELL and recent density-related dispersal movements by Yellowstone bison represent an attempt to operate at this larger scale. These movements are a natural process resulting from successful conservation, but can also serve as a "sink" because bison are generally culled from the population if they resist brucellosis risk management actions (e.g., hazing attempts to return them to the park). People often have a scale of perception that is set by the duration of their experiences, and we imprecisely remember not much more than half a century of experience, which generally extends over relatively small scales of space. Thus, it is not surprising that many people have conveniently forgotten bison are migratory wildlife that once wintered in low-elevation valleys throughout the GYA and beyond. For much of the past 100 years, Yellowstone bison were constrained to 2-3 relatively independent breeding groups that migrated into three discrete wintering areas, but did not regularly and extensively venture outside the park.

The limited spatial scale of this paradigm has reinforced multi-generational societal perceptions that Yellowstone bison should always remain within the boundary of YELL, and is reflected in the status and authority for management afforded to bison adjacent to the park in the GYA states. The Comprehensive Wildlife Conservation Strategies for Idaho, Montana and Wyoming greatly curtail wild bison abundance and distribution outside YELL. For the purposes of brucellosis management, the United States Department of Agriculture considers all bison removed from YELL, for purposes other than consignment directly to slaughter, as alternate livestock. Thus, even if the risk of brucellosis transmission could be eliminated from bison, it is unlikely these massive animals would be tolerated in many areas outside the park due to social and political barriers such as human safety concerns (e.g., motorists), conflicts with private landowners (e.g., property damage), depredation of agricultural crops, competition with livestock grazing, lack of local public support, and lack of funds for state management. Since the evolution of a substantially larger bison conservation area outside of YELL is the prerogative of the GYA states, the prevailing social carrying capacity of Yellowstone bison is perhaps most limiting.

Freese et al. and Sanderson et al. recently documented that the North American bison is ecologically extinct across its former range and called for urgent measures to conserve the remaining wild and free-ranging bison, and restore the species as wildlife in focal areas across its historic range. Conservation of the migratory and nomadic tendencies of bison, as well as their ecological role (e.g., nutrient redistribution, competition with other ungulates, prey for carnivores, carcasses for scavengers, stimulation of primary production, dispersal of plant seed), is paramount for the perpetuation of the species. Thus, there is strong scientific and management support for managing the Yellowstone population above a minimum conservation target of 2,500 bison. Given the spatial and temporal scales aligned with this primary conservation area, this objective should be possible, with appropriate levels of management-induced dispersal "sink" conditions (e.g., hunting and brucellosis risk management). While evidence indicates the Yellowstone bison population has not exceeded the park's food-limited carrying capacity, it is also clear that the interactive effects of severe winters with population levels greater than 4,500 induce large-scale migrations of bison to lower-elevation winter range outside YELL. Such migrations would jeopardize brucellosis risk management objectives by overwhelming temporal and spatial separation between bison and cattle. Thus, we propose that a Yellowstone bison population that varies on a decadal scale between 2,500 and 4,500 animals should satisfy the collective long-term interests of stakeholders, as a balance between the park's forage base, conservation of the bison population and their migratory tendencies, brucellosis risk management, and other societal constraints.

Idaho Review (Report pending)

Montana Review,
Dr. Martin Zaluski, Montana State Veterinarian

In July 2009, Montana was Classified Brucellosis Free, and consequently all 50 states in the Nation have been declared free of brucellosis in livestock. Montana will continue the Brucellosis Action Plan through January 10th, 2010 (6 months following reclassification to Class Free), at which time the area for livestock surveillance and risk mitigation activities will be adjusted. The 2008 elk surveillance (mostly hunter harvest) yielded 880 usable samples. Of the 880 samples, 62 (7%) were seropositive on standard serologic tests, and 13 (1.5%) were determined to be positive on western blot. Western blot positive elk were found in 5 hunting districts (HD) in the 2008 surveillance and in 4 HD in 2007 surveillance. The road ahead includes continuation of wildlife surveillance, adjustment of the livestock surveillance area, continuation of risk mitigation activities in livestock, and development of objective tools to assess risk of transmission and risk mitigation.

Wyoming Review
Dr. Jim Logan, Wyoming State Veterinarian

Wyoming lost it's free status in 2004, and we regained our free status in 2006. We had one case of Brucellosis in 2008 that was confined to one herd due to early detection. This herd was depopulated in October 2008. Over 8,000 head of cattle that were tested in relation to this herd all tested negative. We still have our free status. However, if one more case is found anywhere in the state between now and October 2010, our free status will be lost. All of Wyoming's cases have been confirmed to have been of wildlife origin. All infected herds were located within close proximity to elk feedgrounds and/or calving grounds. Wyoming's revised Chapter 2 Brucellosis Rules were signed into effect on May 8, 2009 by Governor Dave Freudenthal. These rules require Brucellosis vaccination statewide, with more stringent vaccination requirements within the Designated Surveillance Area (DSA). They also require that all female cattle 12 months of age and over (statewide) be officially identified. The Chapter 2 Rules also require that female cattle 18 months of age and over cattle originating in the DSA must be tested. All tests must be completed within 30 days prior to change of ownership, movement from the DSA, interstate movement, and exit from feeder channels. DSA cattle that are tested during "low-risk" exposure time frames (July 1 through November 1) will be allowed to move within 60 days of the negative test date. DSA cattle that are tested during "high-risk" exposure time frames (November 2 through June 30) will be allowed to move only within 30 days of the negative test date. Tests may be conducted at the ranch prior to movement or at a Wyoming Livestock Auction Market prior to sale. Wyoming recently revised its rules and no longer requires first point testing statewide except for cattle originating within the DSA.

As a form of strategic surveillance, the Chapter 2 Rules also require Wyoming Custom Slaughter Facilities to collect blood samples from all Bovinae 12 months of age and older at the time of slaughter, and to submit the samples to the Wyoming State Veterinary Laboratory for testing. This surveillance exceeds national standards and requirements. Through Wyoming's prevention and surveillance efforts, large numbers of animals have been vaccinated and tested for Brucellosis. From July 1, 2008 to June 30, 2009, there were 179,705 Bovinae vaccinated for Brucellosis statewide. 178,940 of those vaccinated were cattle, while the remaining 765 were bison. 179,056 were calfhood vaccinates, and 649 were adult vaccinates. During the same time frame, 82,930 Bovinae were tested for Brucellosis statewide – 82,918 of these animals tested negative, while 12 animals from the 2008 infected herd tested positive. These testing numbers include all herds (infected, adjacent, and contact) associated with the case in 2008, as well as from the rest of the state through routine surveillance. In the last 9 years, Wyoming has tested over 800,000 head of cattle for Brucellosis. This includes infected herds, the adjacent and/or contact herds associated with the infected herds, as well as routine testing statewide.

The Wyoming Livestock Board, Wyoming Department of Agriculture, USDA/APHIS, Wyoming State Vet Lab, and Wyoming Game and Fish personnel held four meetings with producers statewide to discuss the new APHIS concept for the National Brucellosis Program's future. Wyoming, Idaho, and Montana state veterinarians have provided considerable input to APHIS in the development of this new concept. It is our collective goal to prevent the spread of Brucellosis from wildlife within our DSA's to cattle anywhere in the United States. We do still expect to find sporadic cases of Brucellosis among our cattle herds as long as there is a wildlife reservoir of the disease in our state. Our test and identification requirements provide good surveillance, traceability, and early detection. We expect this, along with wildlife risk mitigation efforts, to prevent the disease from spreading beyond the boundaries of our defined surveillance area. The Wyoming Livestock Board pays the direct costs of Brucellosis testing for required testing within the DSA. The Wyoming legislature has allocated funds for Brucellosis Risk Mitigation

Projects to help producers. Such projects include: spaying heifers, voluntary surveillance testing, adult vaccination, strategic fencing, emergency strategic relocation of cattle, authorized strategic bison or elk feeding to prevent commingling, and emergency cattle feeding.

Dr. Terry Kreeger, Wyoming Game and Fish Department veterinarian reported on Brucellosis wildlife risk mitigation authorities in Wyoming. Surveillance activity includes testing of samples submitted by hunters from elk killed in specific hunt areas each year as well as sampling elk trapped or killed I the Designated Surveillance Area annually. This testing has indentified increased seroprevalance in Western Park County (east of YNP) which is an area where there are no elk feedgrounds. The test and removal pilot project on three elk feedgrounds in Sublette County is in the fifth and final year. This project has shown a decrease in seroprevalance in elk in each of the past three years and test and removal will remain a tool for future use in strategic locations. Prevention activities in clued vaccination with strain 19 or 2 of the 23 elk feedgrounds. Elk feeding is one mechanism used to attract elk away from cattle feedlines and to prevent co-mingling. WGFD is shortening the feeding season as weather allows and is experimenting with feeding techniques to attempt to reduce the contamination of elk and to spread them out of the feedground to avoid exposure. Research efforts include Brucella/Yersinia diagnostic chute side test development and vaginal implant transmitter studies. The WY Livestock Board and the WGFD are also working with the USFWS and the Wind River Indian Reservation to conduct surveillance activities on elk on the reservation which is adjacent to Wyoming's Designated Surveillance Area.

Summary of the Panel on the Future of the National Brucellosis Program

Dr. Mike Gilsdorf moderated a panel discussion addressing the future of the national Brucellosis program and the concept paper recently published in the federal register. Panelists were Dr. Lee Anne Thomas, USDA-APHIS-VS, Dr. Tom Roffe, USGS, Dr. Terry Kreeger, WGFD, Mr. George Teagarden, Kansas Animal Health Official, and Dr. Bill Barton, Idaho State Veterinarian. The panel agreed that it is time to make appropriate changes to the national program for *Brucella abortus* in cattle while recognizing that it is important to mitigate exposure risks from infected wildlife in the GYA. Pertinent comments and questions brought forth by the panelists and meeting participants included: Slaughter surveillance and timely reporting of results to the state veterinarians should continue to be a part of the program; Brucellosis does not really have a negative effect on elk population. We do not currently have the necessary tools to eradicate the disease from wildlife populations, but we do need to continue working together to mitigate exposure risks and manage wildlife to prevent transmission from wildlife to livestock; Vaccine research is necessary for both wildlife and cattle and this must include vaccine delivery system development; Better diagnostics are necessary and research funding must be secured; Legal constraints and agency authorities are limiting factors in our ability to deal with the wildlife issues; Public education about the issue is of paramount importance; and Wildlife (elk and bison) population must be kept at objective to efficiently manage brucellosis. State animal health officials have concerns including: Continued adequate surveillance nationwide needs to be funded even when resources are redirected to where the risks in greatest; State veterinarians need to be involved in assessing the adequacy of stat program's ability to prevent the spread of Brucellosis from the GYA; Implementing an "oversight committee" composed of GYA state veterinarian, GYA producers, non-GYA state vet, non-GYA producer, APHIS/VS personnel and others TBD would help maintain the validity of a state's program; APHIS does not intend to "walk away from" the brucellosis issue in the GYA; There will be continued reliance on state's authority to issue quarantines and require surveillance, prevention, movement restrictions, and animal identification; Traceability is a critical component of the program's success; Regulatory performance standards to provide a "level of comfort" for trading partners; Idaho, Montana, Wyoming will continue to enforce their current brucellosis regulations to protect their states and all other stated from spread of Brucellosis whether this concept goes forward or not; Funding for abortion serology surveillance should be maintained; and There is concern about decreasing first point testing nationwide due to surveillance adequacy and also animal identification capabilities pertaining to traceability. There was general agreement that providing flexibility in the national program and utilizing targeted surveillance with traceability is an appropriate direction for the program at this time.

Committee Business:

The Committee reviewed and passed five resolutions, which were submitted to the Committee on Nominations and Resolutions for review.

REPORT OF THE SCIENTIFIC ADVISORY SUBCOMMITTEE ON BRUCELLOSIS

Chair: Dr. Philip Elzer

Subcommittee Chair Phillip Elzer, Brucellosis Researcher, Louisiana Annual State University (LSU), convened the Subcommittee at 12:00 p.m., October 12, 2009. Subcommittee members present included Don Davis, Phillip Elzer, Don Evans, Barb Martin, Steve Olsen, and Jack Rhyan. There was one scientific issues referred to the Subcommittee during the year. There were 23 visitors also in attendance. Don Evans presented on new suspect range for the FPA for cattle based on the data provided by Texas and Missouri. The committee recommends that Veterinary Services amend the 9CFR and UM&R to change the suspect range from 11-20 delta milipolar units to 11- 40 as long as the animal is complement fixation negative. Don Evans presented data that was used to originally evaluate swine brucellosis serology from 1999. Swine Health Staff requests that the Brucellosis Scientific Advisory Committee review available data and provide a recommendation on a surveillance (not diagnostics) testing algorithm to be used for swine brucellosis. Dr. Plumb charged the committee to evaluate the above request. Based on the data from 1999 the committee recommends the FPA test followed by Complement fixation on all FPA positive samples. Steve Olsen is communicating with the scientists in Russian regarding the S82 vaccine in order to develop a review paper and once this information is conveyed, Dr. Olsen will present it to the committee. Frank Galey, University of Wyoming, introduced the Consortium for the Advancement of Brucellosis Science (CABS) which is a follow up on the Laramie Agenda. CABS is a cooperative effort among scientists and stakeholders to evaluate current brucellosis research, indentify gaps, and develop research protocols for funding partners for the advancement of brucellosis science for both domestic and wild animals. A resolution to support CABS was presented to the committee and the committee unanimously endorsed the resolution and it was given to Dr. Logan for presentation to the main committee. The committee discussed the decline in our ability to do scientific research in the field of brucellosis due to the select agent rules and regulations. This is so dramatic that the national capacity to do large animal research has evaporated. This is apparent by the total lack of scientific presentations to the USAHA general assembly on brucellosis. In the past it was possible to do large ungulate brucellosis research in the following states: Colorado, Idaho, Iowa, Louisiana, Texas, and Wyoming. During that time any one facility could conduct research using 30 -300 large ruminant species. As of this date Iowa can 24 cattle or perhaps elk in the current facilities. In the future assuming commissioning, accreditation and all other approvals are met the Iowa and Louisiana facilities can conduct large animal brucellosis research in indoor facilities. The committee still encourages USDA and CDC to support the outdoor brucellosis research facilities check list to aid in the expansion of the much needed brucellosis research in wild ungulates. VS requested that the Brucellosis Scientific Advisory Subcommittee evaluate the use of *Brucella abortus* Strain RB 51 vaccine in bison between the age of 12 and 18 months. If this Subcommittee recommends the use of this vaccine in this age of animal, the Center for Veterinary Biologics will evaluate the recommendation. Data was presented by Dr. Olsen regarding serological responses in bison calves vaccinated with RB 51 between the ages of 12 to 24 months. Bison calves vaccinated during this time frame remained sero-negative after vaccination. The committee recommends that Veterinary Services expands the use of RB 51 vaccination in bison calves to the age of 12 to 24 months. Dr. Walt Cook, WY asked the committee for their opinion on the role of wolves and the transmission of brucellosis to wild or domestic animals. The committee had an active discussion regarding this issue and the committee resolves that canids are not a significant source for the transmission of brucellosis based on scientific research, published data and historical experiences. The brucellosis scientific advisory committee unanimously endorsed the resolution developed by the subcommittee on brucellosis in the GYA, regarding the review of select agent status for *Brucella abortus*.

REPORT OF THE FERAL SWINE SUBCOMMITTEE ON BRUCELLOSIS AND PSUEDORABIES

Chair: Dr. C. Carter Black

The Subcommittee met on Sunday, October 11, 2009. Twenty-three persons were in attendance at the meeting, including 10 members of the Subcommittee. Reports were provided on a number of disease issues of interest to USAHA and its members. A summary of the reports is included below. Dr. Joseph L. Corn, Southeastern Cooperative Wildlife Disease Study (SCWDS), University of Georgia, provided an update on the National Feral Swine Mapping System (NFSMS). SCWDS produced nationwide feral swine distribution maps in 1982, 1988 and 2004 by working directly with state and territorial natural resources agency personnel. In 1982, 17 states reported feral swine in a total of 475 counties. In 2004, 28 states reported feral swine in 1014 counties. With support from USDA-APHIS-Veterinary Services (VS) the SCWDS has now developed the National Feral Swine Mapping System (NFSMS), an interactive data collection system to be used to collect and display real time data on the distribution of feral swine in the United States. The real time feral swine distribution maps are produced using data collected from state and territorial natural resources agency personnel and from USDA-APHIS-Wildlife Services (WS). The real time map is available to be viewed by the public on the NFSMS home page. Distribution data submitted by agency personnel are evaluated by SCWDS on a continual basis, and the real time distribution map updated with verified additions on a monthly basis. Feral swine populations and/or sightings are designated on the map either as established and breeding populations, or as sightings. The 2008 map revealed that feral swine are currently in 35 states. The NFSMS is accessed via the internet at http://www.feralswinemap.org/. Mr. Seth Swafford, USDA-APHIS-Wildlife Services gave an update on the USDA-APHIS-Wildlife Services. Wildlife Services has conducted projects on trap monitors, feral swine barriers and experimental FMD infection in feral swine at FADDL. They worked on projects in North Carolina, Nebraska and Kansas in addition to depopulation projects in Michigan, Tennessee and Pennsylvania. Wildlife Services conducted Comprehensive Disease Surveillance for CSF, FMD, Brucellosis, PRV, Trichinae and Toxoplasmosis in feral swine. Dr Greg Hawkins, Texas Animal Health Commission reported on B suis infection in cattle in Texas. There have been 46 head of cattle in 31 herds infected with B suis from 1998 through 2009. They are concerned that there may be cow to cow transmission of B suis. With termination of first point testing these animals will be detected at slaughter and the state will not be able to determine if B suis is the cause of the titer. Dr. Troy Bigelow, USDA, APHIS gave an update on the swine programs. USDA is funding the SCWDS feral swine mapping project and Wildlife Services feral swine disease surveillance project. Dr. Bigelow reported that there was three transitional swine herds infected with swine brucellosis (SB) in Georgia. All states are SB Free except Texas which is stage 2. All states are Stage V (Free) for PRV. Dr. Bigelow also reported on the new surveillance system that will be conducted at the NAHLN and Regional laboratories. USDA is also working on swine diseases regulatory changes and updates. Dr. Edwin Hahn, University of Illinois, reported on his studies of pseudorabies viruses from feral origin and domestic origin. Most strains that have surfaced in transitional outbreaks can be distinguished by sequencing within the gene for gC. Virus strains from feral swine in the South Central States showed the greatest variation in gC sequence. Sixty-three feral samples were also tested for the viral gene for gE. Absence of the marker gE gene would be an indication of the presence of marker vaccine virus. No evidence of marker vaccine was found in feral swine samples, suggesting that vaccines were not circulating. Detection of viral DNA in most feral pig oral tissues suggests that the virus uses oral spread as part of the transmission mechanism in addition to what has been shown about venereal transition. Highest virus load was in tonsils, but viral DNA was also found in salivary glands, taste buds and mucosa near the tusks. The development of a real time PCR assay to quantify the actual number of genome copies in a tissue was described that represents a powerful tool for both detection and research in viral pathogenesis. There was one resolution presented and passed concerning SB and is forwarded to the Committee on Brucellosis adjourned at 4:10.

REPORT ON THE SUBCOMMITTEE ON BRUCELLOSIS IN THE GREATER YELLOWSTONE AREA

Chair: Dr. Martin Zaluski

The purpose of the Subcommittee on Brucellosis in the Greater Yellowstone Area is to provide support and recommendations to the Committee on Brucellosis for disease transmission risk management and the eventual elimination of the disease in the Greater Yellowstone Area. Arising from the highly successful national brucellosis eradication program among domestic livestock and captive wildlife, free-ranging wild elk and bison in the GYA are now recognized as the last reservoir of B. abortus in the United States. The Subcommittee on Brucellosis in the Greater Yellowstone Area serves as a forum and clearing house for ideas and proposals that have been submitted to it by state and federal members, industry representatives, researchers, wildlife interests and others. Members present included Marty Zaluski, Terry Kreeger, Michael Gilsdorf, P.J. White, Neil Anderson, Jim Logan, Bill Barton, and Dave Hunter. Brian McCluskey, DVM, Director, Western Region USDA-APHIS described an effort to quantify risk of brucellosis transmission based on herd management practices that include vaccination, biosecurity, testing and traceability. Brant Schumaker , Candidate PhD, University of California, Davis, spoke about his project to model the geography of risk of transmission in the Northern GYA. The project aimed to characterize spatio-temporal shedding probabilities on the northern GYA landscape from bison and elk populations. Through this project, Brant assessed the probability of shedding in two-month intervals from January to June based on mild, average, and severe winter snowfall patterns. Shedding maps will show the varying probabilities by season, snowfall, and across the landscape. Glenn Plumb, PhD, Chief of Natural Resources, Yellowstone National Park spoke about the carrying capacity for bison in the park and indicated that the target for bison population abundance in Yellowstone National Park should be between 2,500 and 4,500 animals (see full presentation below). Kelly Proffitt, PhD, Wildlife Research Biologist, Montana Department of Fish Wildlife and Parks, spoke about elk-wolf interactions in the Greater Yellowstone Area (GYA). In the GYA, elk responses to predation risk have received considerable attention since reintroduction of wolves. Elk responses to predation risk have included changes in group size, vigilance, movement rates, and habitat selection. Kelly discussed how these responses may affect elk to elk and elk to livestock brucellosis transmission risk. Dave Hunter, Wildlife Veterinarian, Turner Enterprises, Inc., spoke about the challenges of operating a large domestic bison operation within the brucellosis surveillance area of Montana.