FEDERAL AID ANNUAL RESEARCH PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

PROJECT TITLE: Wildlife Health and Disease Surveillance in Alaska

PRINCIPAL INVESTIGATOR: Kimberlee Beckmen

COOPERATORS: US Department of Agriculture, Alaska Department of Environmental Conservation, University of Alaska Fairbanks, National Marine Fisheries, National Marine Mammal Laboratory, Alaska Department of Health and Human Services, US Fish and Wildlife Service, The North Slope Borough, University of California Davis and the University of Tennessee

FEDERAL AID GRANT PROGRAM: Wildlife Restoration

GRANT AND SEGMENT NO. W-33-7

PROJECT NUMBER: 18.74

WORK LOCATION: Alaska, Statewide

STATE: Alaska

PERIOD: 1 July 2008 - 30 June 2009

I. PROGRESS ON PROJECT OBJECTIVES SINCE PROJECT INCEPTION

The Wildlife Health and Disease Surveillance in Alaska project is ongoing. The project statement was revised for the period July 1, 2007 to June 30, 2012. The overall objectives for the project are to:

1) Document, evaluate, and monitor the incidence of diseases in free-ranging wildlife as well as the potential impacts of disease on wildlife populations in Alaska.
2) Ensure animal welfare considerations in the capture and handling of wildlife by the Division for research or management purposes.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL WORK PLAN

JOB/ACTIVITY 1: Maintain the Chronic Wasting Disease Surveillance Program.

The Chronic Wasting Disease section of the Alaska Dept of Fish & Game's Wildlife Conservation website was updated multiple times. In addition to general information on Chronic Wasting Disease, the website includes the results from past years' testing for CWD in Alaska, information on the 2008/09 surveillance efforts and collection of samples, and the current year's results. The CWD webpage was expanded to include links to annual maps of the CWD samples tested in Alaska illustrating the numbers tested by cervid species and game management units for each of the years testing was conducted, a map of the total numbers tested by species and game management unit for the past five years, a North America map showing locations of CWD, and charts of the statewide numbers tested for each species annually.

The regionally specific tri-fold flyer “Chronic Wasting Disease and Alaska” was updated, printed and distributed to ADF&G and USFWS offices in Kodiak, Anchorage, Palmer, Soldotna, Homer, and Delta and made available to the public. In Kodiak, the only location where hunters were solicited for cervid head donations, flyers and posters were also distributed to transportation facilities (e.g. ferry terminal, air charter businesses), hunting license vendors, hunting/sporting stores, and the taxidermy businesses. Posters were posted on community bulletin boards.

Two training sessions were held on the proper collection and preservation of tissue samples for CWD testing with ADF&G and technicians from regions with captive cervid facilities where targeted surveillance is being emphasized. Ten people total were trained.

Targeted surveillance for moose around game farms was increased. In the Palmer area (GMU 14A), a total of 33 road killed moose were collected from areas near game farms and 32 were sampled. One Sitka black-tailed deer killed by a car in Kodiak (GMU 8), in the same northeast area of the island as the game farm, was tested and results are negative.

The population of deer is significantly decreased in the northern part of the Kodiak archipelago, suspected to be due to increased winter mortality the past few years. 2008 harvest numbers were below the average of the last 5 years. A minimum goal of 90 SBT deer was set. Elk heads were not sought as actively as in previous years, but it was expected to receive a minimum of 6. Samples from 14 Roosevelt elk and 99 Sitka black-tailed deer from hunters’ harvests in Kodiak (GMU 8) were collected. Thirteen elk and 96 SBT deer were sampled and tested negative, surpassing the goals set for this year with consideration to this year’s circumstances. One unsolicited Sitka black-tailed deer from a hunter’s harvest in Prince William Sound (GMU 6D) was brought in by the hunter and sampled.

In order to develop draft contingency plans to respond to the event of detecting CWD on a game farm or in the free-ranging cervid population, a number of resources were reviewed including the current response plans from a number of states and Canadian provinces, Chronic Wasting Disease publications, and summary notes from various Chronic Wasting Disease workshops, including experiences that other states had after discovering CWD for the first time. CWD response and management options, goals, and tools to consider for use if a positive case of CWD was found in Alaska, soundly based on current scientific knowledge of CWD and applicable to Alaska, were compiled. A first draft response plan incorporating these various options was written for the event a positive case of CWD is found in Alaska first in the free-ranging population or first in the captive cervid population.

The Alaska CWD Task Force was reformed, and includes members from all three Alaska state departments with responsibilities to cervid populations: the Alaska Department of Fish & Game (free-ranging populations), the Alaska Department of Environmental Conservation (captive cervids), and the Alaska Department of Natural Resources (elk farm permits and fence inspections). The Task Force came to a consensus on development of a general wildlife disease response plan rather than a detailed CWD-specific plan. Task assignments and goals were set to proceed with response plan development.

Table 1. Statewide Free-ranging cervids sampled, ADF&G, July 2008-June 2009.

TARGETED SURVEILLANCE (Clinical Suspects/Roadkill)

GMU/Region	Species	# Samples Collected (APHIS-funded)	# Samples Tested (APHIS-funded)	# Positive (APHIS-funded)	Total # Samples Collected	Total # Samples Tested	Total # Positive
8/Kodiak Archipelago	SBT Deer	1	1	0	1	1	0
14A (Palmer/Wasilla)	Moose	34	15	0	34	15	0
15 (Kenai/Soldotna)	Moose	6	0	0	6	0	0
26/Umiat	Moose	1	1	0	1	1	0
Targeted Surveillance Totals		42	17	0	42	17	0

ACTIVE SURVEILLANCE (Hunter Harvested)

GMU/Region	Species	# Samples Collected (APHIS-funded)	# Samples Tested (APHIS-funded)	# Positive (APHIS-funded)	Total # Samples Collected	Total # Samples Tested	Total # Positive
6/Prince William Sound	SBT Deer	1	0	0	1	0	0
8/Kodiak Archipelago	SBT Deer	0	0	0	99	96	0
8/Kodiak Archipelago	Roosevelt elk	0	0	0	14	13	0
Active Surveillance Totals		1	0	0	113	109	0

Statewide totals (APHIS-funded testing):	**43**	**17**	**0**		
Statewide totals (Overall):			**155**	**126**	**0**

JOB/ACTIVITY 2: <u>Maintain the blood, serum and tissue banks.</u>

Blood and/or serum from 807 samples were accessioned into the archive from mammals that are captured by ADFG personnel. Blood, serum or tissues as suitable were also collected at necropsy on 171 specimens presented for postmortem examination. Samples were accessed to outside investigators and graduate students, including the University of Alaska Fairbanks Museum, University of Tennessee, University of California – Davis, California Department of Fish and Game, who are working on collaborative projects with ADFG. Two ultra cold freezers broke down due to lack of ventilation in the new laboratory building. One was repaired and the other had to be replaced. S. Crawford attended courses on MS Access 2007 to better maintain the serum bank records and test results.

JOB/ACTIVITY 3. <u>Conduct disease and parasite surveillance and monitor changes in disease patterns.</u>

Tissues, parasites, or whole carcasses presented by the public, as well as incidental takes such as road-kill, capture mortalities of other investigators, and animals found dead were examined. Accessions exceeded 200 specimens. Gross diagnoses were assigned when possible and parasite identification or histopathological diagnoses were pursued on unusual cases or those with lesions of concern.

A base-line health assessment of the Teshekpuk Caribou was conducted. Ten caribou each were collected at the Red Dog Mine in March and Teshekpuk Lake in June for in depth health and disease surveillance. Tissue analysis and histopathology is in progress.

I conducted necropsies and health assessments on four Dall's sheep for the Region II sheep biologist. Important pathogens associated with pneumonia and population declines in Bighorn sheep were detected for the first time in Alaska's Dall's sheep.

Serosurveillance results for over 5000 serologic tests were completed and test results entered into the DWC Serology Database.

Four brains from foxes were submitted to the Alaska State Virology Lab for rabies testing.

Wood Bison Herd Health Surveillance for *Brucella abortus*, Johnes, Bovine tuberculosis, Bovine Respiratory virus complex and additional diseases and parasites of concern were conducted in collaboration with the Alaska Department of Environmental Conservation Office of the State Veterinarian and the USDA. An undergraduate student intern from UAF was mentored while participating in a project to develop reference ranges for wood bison serum chemistry and other blood parameters.

I continued to participate on the Wolf Lice mitigation project with co-PI Craig Gardner. Related to the project, I served as a thesis committee member for UAF Master' candidate Theresa Woldstad whose thesis is based on samples and data collected during our studies with lice on wolves.

JOB/ACTIVITY 4. Monitor levels of environment contaminants in species of concern.

A collaboration with UAF faculty, Dr. Todd O'Hara continued a study of mercury contamination in Steller sea lions (Abstract by Castellini et al. below). Hair, blood, liver, kidney and muscle were collected for trace elements and metals analysis on caribou collected at the Red Dog Mine. The heavy metal residue levels will be used to determine if the caribou are accumulating heavy metals in excess of recommendations for human consumption.

JOB/ACTIVITY 5: Assess the nutritional trace mineral status of Dall sheep, moose and caribou.

Blood, serum and tissues samples were collected and submitted for analysis at Wyoming State Veterinary Laboratory. The trace minerals studies were expanded to include muskoxen and data analyzed. Presentations of the results were given at two meetings.

JOB/ACTIVITY 6: Review literature; prepare annual progress reports, a final report, and manuscripts for publication in refereed literature.

Progress reports were generated for Federal Aid and CWD Surveillance program as well as periodic reports on disease surveillance activities. Two manuscripts were published and one has been submitted for review

Published:

G. Wobeser, T. Bollinger, A. Neimanis, and K.B. Beckmen. 2009. Dermoid cysts in caribou. Journal of Wildlife Diseases 45 (2) 505- 507.

ABSTRACT: Subcutaneous dermoid cysts were identified in eight wild caribou (Rangifer tarandus) from northern Canada and one wild caribou from Alaska. The dermoid cysts from Canadian caribou were found among 557 diagnostic specimens that had been

detected by hunters and submitted by resource officers and biologists between 1 January 1966 and 15 May 2007. All of the cysts were located in the cervical region and five of nine were found in the throat area. Dermoid cysts were not diagnosed in any of 1108 white-tailed deer (Odocoileus virginianus), 293 mule deer (Odocoileus hemionus), 174 elk (Cervus elaphus) or 529 moose (Alces alces) examined during the same period at the Canadian laboratory.

In Press:

Lori Quakenbush, Kimberlee Beckmen and Charles D. N. Brower. 2009. Rehabilitation and release of marine mammals in the United States: Concerns from Alaska. Marine Mammal Science.

ABSTRACT: The release of rehabilitated marine mammals has become more common as marine mammal medicine and husbandry have advanced and as anthropogenic activities have impacted marine mammals and their habitats resulting in more injured or otherwise distressed marine mammals brought into captivity for rehabilitation and their subsequent release back to the wild. Moore *et al.* (2007) published an extensive review of the historic, legal, conservation, educational, philosophical, and moral aspects of rehabilitation and release. Further, Moore *et al.* included a good, but incomplete, discussion of the risks and benefits of rehabilitation and release of marine mammals in the United States. Of the 50 United States only Alaska has coastal communities (close to 100) of indigenous peoples who rely on marine mammals for food, clothing, materials, art objects, and activities that sustain them and their cultural identity. Because of this reliance on marine mammals, the action of releasing rehabilitated marine mammals carries a much greater significance to the people of Alaska, which needs to be addressed in a review of the risks and benefits in the United States. The objective of this paper is to expand the discussion presented by Moore *et al.* by including the concerns of people who have much to lose if marine mammals that have been held and treated in captivity become vectors of disease or parasites to wild populations upon their release

Submitted:

J. Lindsay Oaks, DVM, PhD, Thomas E. Besser, DVM, PhD, Kimberlee B. Beckmen, MS, DVM, PhD, Kathy A. Burek, DVM, MS, Gary H. Haldorson, DVM, PhD, Dan S. Bradway, Fred R. Rurangirwa, BVSc, MS, PhD, Margaret A. Davis, DVM, MPH, PhD, Greg Dobbin, MSc,, Pierre-Yves Daoust, DVM, PhD, and Thomas S. Whittam, PhD. Infection and mortality in wild and domestic birds due to *Escherichia albertii*: description of avian strains of an emerging pathogen.

ABSTRACT: A mortality event affecting common redpolls (*Carduelis flammea*) in Alaska led to the identification of *Escherichia albertii* as the probable cause. Subsequent investigation associated *E. albertii* with enteritis in other birds, including a falcon, a chicken, and detection in clinically normal finches. In addition, isolates from finch mortality events in Scotland previously identified as *Escherichia coli* O86:K61 were shown to be *E. albertii*. *E. albertii* is a recently described member of the *Enterobacteriaceae* associated with diarrheal illness in humans, but has not been previously associated with disease or infection in animals. Similar to the human isolates, the avian *E. albertii* isolates contained genes for *eae* (intimin) and *cdt* (cytolethal

distending toxin), but lacked the genes for s*tx* (Shiga toxins). Comparison of *eae* and *cdt* sequences, multilocus sequence typing, and pulsed field gel electrophoresis showed that the avian *E. albertii* strains are heterogeneous and distinct from human *E. albertii* isolates.

I attended several major international meetings, conferences, or symposia to present research findings and received continuing education credits required to retain veterinary licensure in Alaska. In chronological order these meeting and abstracts of presentation were as follows:

Oral Presentation:

Annual Conference of the Wildlife Disease Association, August 4-10 2008, Edmonton Alberta: Pathological Investigations of the Decline of North Slope Muskoxen. Kimberlee Beckmen, Stephen Arthur, Josephine Afema, Jonna Mazet, Kathy Burek, and Elizabeth Lenart.

ABSTRACT: Sixty-four muskoxen were reintroduced into areas in and near the Arctic National Wildlife Refuge in northeastern Alaska in 1969-70. This isolated population expanded to approximately 800 by 1995, then began declining. Numbers dropped sharply in the refuge beginning in 1999. By 2006 virtually no muskoxen were found in the refuge, and less than 400 animals remained in neighboring areas. Several factors appear to be involved in the decline, including weather and brown bear predation on all age classes. Preliminary investigations suggest that disease, parasitism, and essential trace element deficiencies also have had a role. Morbidity and mortality caused by infectious pathogens have been identified, including *Chlamydiophila* polyarthritis, *Pasteurella trehalosi* pneumonia and contagious ecthyma. The potential contributions of *Hemophilius* and bovine viral diarrhea are also being pursued with further diagnostics. Hoof lesions and low copper levels in tissues were detected, leading to further studies of essential elements in comparison to other populations of Alaskan muskoxen. Retrospective and prospective serology indentified antibodies to additional infectious diseases that were not present pre-decline in this population including: *Brucella suis* serovar 4, leptospirosis, and infectious bovine rhinotracheitis. ELISA and PCR on vaginal and conjunctival swabs as well as IHC on joint cartilage indicated the presence of *Chlamydiophila* in up to 45% of adult female muskoxen, compared to rates of 29% seropositive, 100% PCR-negative for females of similar age/reproductive class in a healthy, increasing population in western Alaska.

Poster Presentation:

Health Assessment of Steller Sea Lions in Alaska, USA. Lieske, Camilla; Beckmen, Kimberlee; Burek, Kathy.

ABSTRACT: One hypothesis for the decline in the endangered western stock of Steller sea lions (*Eumetopias jubatus*) as compared to the threatened eastern stock is decreased pup survival rate. In conjunction with surveys for population dynamics, infectious disease prevalence and toxicologic exposure, methods for evaluating individual and population health are important evaluation tools. An objective, quantitative method of comparing individual and population health was developed as part of an epidemiological assessment of Steller sea lion health in Alaska, USA. Utilizing samples collected between 1998 and 2005, from sea lions aged one to 30 months, “normal” ranges for hematology and blood chemistry parameters (hematocrit, white blood cell counts, total protein, albumin/globulin ratio, total bilirubin, BUN, creatinine, liver enzymes (ALT, AST, GGT), alkaline phosphatase, calcium, chloride, sodium, potassium, phosphorus, CO2 and glucose) were determined. These ranges were used to score different parameters, incorporating expected age differences and physiological associations (e.g. renal function score based on both BUN and creatinine). A total health score was calculated combining the blood parameters with physical examination findings. Overall, scores did not vary significantly ($p>0.05$) with age and sex, but scores did vary significantly by rookery, with a significant collection year/rookery interaction. No significant difference in pup and juvenile health was noted between the western and eastern stock.

Attended:

CARMA 5, Circumartic Rangifer Monitoring and Assessment Workshop 5, Vancouver, British Columbia, Canada. Dec 2-4, 2008.

Oral Presentation:

The Wildlife Society, Alaska Chapter Meeting, April 7-8, 2009, Fairbanks AK: Pathological Investigations into the Decline of North Slope Muskoxen. Beckmen, Kimberlee B.[1]*, Stephen Arthur[1], Josephine Afema[2], Jonna Mazet[2], Kathy Burek[3], Patricia Del Vecchio[1], and Elizabeth Lenart[1]

[1]Alaska Department of Fish & Game, Division of Wildlife Conservation, Fairbanks, AK 99701 kimberlee.beckmen@alaska.gov
[2]Wildlife Health Center, School of Veterinary Medicine, University of California, Davis, CA 95616
[3]Alaska Veterinary Pathology Services, Eagle River, AK 99577.

ABSTRACT: During 1969-70, 64 muskoxen were reintroduced in northeastern Alaska. This isolated population expanded to ~800 by 1995, then began declining. By 2006, muskoxen had disappeared from the Arctic National Wildlife Refuge, and ~200 remained on the North Slope during 2007-2008. We studied movements, survival, and reproductive success of radiocollared muskox cows and the relative importance of predation, nutrition, disease, and parasites as causes of the population decline. Birth rates ranged from 51% in 2007 to 84% during 2008. Predation, primarily by grizzly bears, was the most common proximate mortality factor, followed by starvation, disease, and accidents. Pathological investigations suggest that these muskoxen have significant exposure to pathogens and parasites, and exhibit perturbations of essential trace elements. Infectious pathogens identified included *Chlamydiophila sp., Pasteurella trehalosi, Arcanobacterium pyogenes* and contagious ecthyma. Low copper and selenium levels in tissues and lesions consistent with copper deficiency were detected. Retrospective and prospective serology identified antibodies to additional infectious diseases that were not present pre-decline in this population including: *Brucella suis* serovar 4, leptospirosis, and infectious bovine rhinotracheitis. ELISA and PCR on vaginal and conjunctival swabs and IHC on joint cartilage indicated the presence of *Chlamydiophila* in up to 45% of adult female muskoxen, compared to rates of 29% seropositive, 100% PCR-negative for females of similar age/reproductive class in a healthy, increasing population in western

Alaska. The Eastern North Slope muskox population demonstrates multiple perturbations of essential elements, higher prevalence and diversity of parasites and exposure to pathogens in comparison to other populations of Alaskan muskoxen.

Abstracts for presentations/posters and co-authored presentations/posters are below. I kept abreast of current research in wildlife disease through the literature and participated as a reviewer for two journals.

Presented at the Alaska Marine Science Symposium, Jan 2009. Presented by lead author Maggie Castellini. Co-authors Todd O'Hara and Kimberlee Beckmen. Mercury Levels in Steller Sea Lion Pups in Alaska.

ABSTRACT: Exposure to mercury of Steller sea lions (SSL) was assessed by measuring total mercury (THg) in hair and THg and methyl mercury (MeHg) in liver. Livers were obtained from necropsies of SSL pups found dead on rookeries. THg in hair varied significantly by region and age. Young pups had the highest and *most variable* levels with lowest mean values occurring in hair from pups in the southeastern (SEA) population (mean ± S.D., 4.0 ± 1.6 µg/g). THg in hair from month old pups from Amak and Sugarloaf Islands averaged 7.7 ± 2.7 µg/g and 8.2 ± 3.8 µg/g, respectively. Hair from 3 month old pups from Prince William Sound (PWS) had the highest and most variable THg (9.1 ± 6.3 µg/g). *25-40% of young pups from the western populations had THg higher than 10 µg/g,* a level which the EPA suggests may indicate exposure sufficient to produce toxic effects. Older pups, young of the year (YoY) and yearlings had significantly lower THg in hair but regional differences were still apparent in YoY. In this case, hair from pups from SEA and PWS had the lowest THg (1.6 ± 0.6 µg/g and 1.1 ± 0.3 µg/g, respectively) while values from pups captured around Kodiak and in the Aleutians were slightly higher (2.7 ± 0.9 µg/g and 2.3 ± 1.0 µg/g, respectively). This represents lactationally derived hair. There was no apparent difference in THg between the livers of month old Steller sea lion pups from SEA (0.80 ± 0.49 µg/g) and PWS (0.84 ± 0.29 µg/g). THg and MeHg were within ranges reported for other marine mammal pups. Consistent with previous marine mammal studies, the proportion of THg that was in the MeHg form was relatively high (53 ± 6 %). A single fetal sample had a very high proportion of MeHg (75%), although both THg (0.41 µg/g) and MeHg (0.31 µg/g) were relatively low. Hair is likely an efficient post-parturient excretory mechanism for newborn pups exposed to Hg in utero. This matrix offers important insights for exposure of the fetus, a well recognized life stage of concern for Hg toxicosis.

The 84th Annual Meeting of the American Society of Parasitologists, Knoxville, Tennessee August 14 – 17, 2009. Delimiting Hookworm Species Parasitizing Pinniped Hosts Using Gene Trees: Phylogenetic Evidence for Host-Sharing and Switching. S.A. Nadler, K. Beckmen, C. Bell, B. Berón-Vera, A. Castinel, K. Burek Huntington, E.T. Lyons, D. Morgades, R. Norman, C. Pagan, and T.R. Spraker.

ABSTRACT: Uncinaria hookworms have been widely reported from juvenile pinniped hosts, however, investigations of their systematics have been limited, with only 2 species formally described: *Uncinaria lucasi* Stiles from the northern fur seal (*Callorhinus ursinus*) and *Uncinaria hamiltoni* Baylis from the South American sea lion (*Otaria flavescens*). *Uncinaria* hookworms were sampled from these two hosts and six additional

species including Steller sea lions (*Eumetopias jubatus*), California sea lions (*Zalophus californianus*), South American fur seals (*Arctocephalus australis*), Australian fur seals (*Arctocephalus pusillus*), New Zealand sea lions (*Phocarctos hookeri*) and southern elephant seals (*Mirounga leonine*). Approximately 200 individual hookworms were sequenced for 5 genes representing 2 loci (mtDNA and nuclear rDNA). Intra-individual sequence polymorphism was extremely rare. Phylogenetic analysis of these data, both as separate loci (mtDNA versus nuclear rDNA) and combined data sets, yielded strong evidence for 6 independent evolutionary lineages or species. Both of the described species each matured in 2 different host species: *U. lucasi* parasitized *C. ursinus* and *E. jubatus*, and *U. hamiltoni* parasitized *O. flavescens* and *A. australis*. The other 4 undescribed species were each associated with unique host species. Patterns of *Uncinaria* host sharing and phylogenetic relationships of species inferred from gene sequences revealed a strong geographic component to host-sharing, and in one case the potential directionality of the host-switching event.

The Wildlife Society, Alaska Chapter Meeting, April 7-8, 2009, Fairbanks AK:
Oral presentation: Gardner, C., K. B. Beckmen, and Nathan Pamperin. Dog louse infestation of wolves in interior Alaska.

ABSTRACT: The dog louse was diagnosed in wolves in Interior Alaska (Unit 20A) in 2004. Past attempts to eliminate lice from wolves on the Kenai Peninsula (1983) and Mat-Su Valley (late 1990s) using ivermectin failed because not all infected wolves were treated. Louse transmittal is through direct physical contact. Dispersal of infected wolves from south central Alaska was probably the source of infection for wolves in Unit 20A. Future dispersal of infected animals will likely result in movement of the parasite to other parts of Interior Alaska. Our objectives were to determine the extent of louse infestation and the rate of transmittal within and from Unit 20A and attempt to develop a management technique that reduced infestation and transmittal rates. During 2006-2009, we monitored 10-15 packs/year of the 20-23 packs in Unit 20A and 1-2 packs in adjacent Unit 20C (control group) for 12 months to 4 years. Infestation rates of the Unit 20A packs were 55% (2006), 29% (2007), 7% (2008), and 0-6% (2009). We treated 5 packs (2006), 4 packs (2007), and 0 packs (2008) by aerially dropping ivermectin injected bait at den and rendezvous sites of infected packs (up to 7 drops/pack). We examined 1-3 wolves/radiocollared pack during the following October-April and none of the treated packs had lice. We verified that 1 pack that was initially louse-free became infested during the study. The 2 untreated packs in Unit 20C remained louse infested throughout the study. Louse transmission rates within and out of Unit 20A appear to be relatively low, presumably due to current dispersal patterns.

Oral Presentation: Lieske, Camilla, and Kimberlee Beckmen. Serum prevalence and distribution of respiratory disease complex viruses in Alaskan caribou and moose.

ABSTRACT: Bovine Respiratory Syncytial Virus (BRSV), Infectious Bovine Rhinotracheitis (IBR), and Parainfluenza-3 Virus (PI3) plus Bovine Viral Diarrhea (BVD), are considered to comprise the bovine respiratory disease complex. In cattle, although these viruses have high morbidity, they are rarely fatal by themselves. Severe clinical signs are primarily seen in young calves, although signs can be seen in cattle of all ages when introduced to naïve herd. In general, these viruses can establish relatively

mild viral infection of the lungs (pneumonia or pneumonitis). More importantly, they damage the lungs and provide an opportunity for bacterial infections to become established especially in the presence of lungworms. The bacterial infections can then progress into more serious and potentially fatal pneumonia. The goal of this study was to characterize the temporal and spatial distribution of the respiratory disease complex viruses in free-ranging moose and caribou in Alaska using a serologic database of 3655 caribou (collected between 1975 and 2007) and 2330 moose (collected between 1968 and 2007). In general, for caribou there was an apparent increase in prevalence to all the respiratory disease complex related viruses in recent years. The greatest increases in serum prevalence was seen the Northern Peninsula herd. This pattern was not as evident in moose, but they have not been tested as extensively as the caribou. The cause of the recent increase in respiratory complex viruses cannot be determined at this time. Additional samples from herds and GMUs that have not been tested recently would be of benefit to help better characterize and monitor these viral diseases.

JOB/ACTIVITY 7. Perform the duties of Attending Veterinarian.

I trained, assisted and conducted wildlife capture operations as requested by staff. I purchased, prescribed and dispensed animal capture drugs to DWC personal. I gave advice and information to the public and DWC employees related to wildlife health and zoonotic diseases via personal contact in the office, on the phone and through the media. I served as chair or the DWC Animal Care and Use Committee (ACUC) as well as the attending veterinarian for the committee to assure Division compliance with the Animal Welfare Act. I conducted a veterinary review of 25 Assurances of Animal Care Protocols submitted to the DWC ACUC prior to committee review. I conducted IACUC Facility inspections of the Moose Research Center, the Moose/caribou research herd held at the UAF Ag facility in Palmer, and the Wood Bison enclosures at the Alaska Wildlife Conservation Center near Portage. I facilitated and taught at the SafeCapture Wildlife Chemical Immobilization Advanced Workshop in Fairbanks Sept 30-Oct 3. I supervised the veterinary aspects of handling, sampling and treatment of the wood bison in quarantine including two herd round ups and handlings.

I revised the controlled and prescription drug handling and dispensing procedures and advised the director on revising the Division polices related to capture drugs. I conducted training in each of the Regions, attended by 75 personnel, to become proficient in the safe handling, storage and administration of capture drugs. I oversaw the complete inventory and reconciliation of all capture drugs ordered, dispensed and administered during captures for the previous two years.

I consulted with statewide staff on import permit issues and disease testing requirements. An illegal importation required a site investigation and initiation of a federal quarantine. The directive of the governor to disregard DWC Orphan Wildlife Policy and no longer allow the humane euthanasia of orphan moose calves, led to a great deal of additional veterinary duties and expenses for the monitoring of orphan calves being held at two private facilities and develop disease testing criteria for future release. The State Veterinarian actively assisted in disease testing of the calves and made several site visits.

I continued to maintain a strong, mutually beneficial relationship as a liaison between ADF&G and the Department of Health and Human Services/Division of Epidemiology and the Division of Environmental Conservation/Office of the State Veterinarian.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

None.

IV. PUBLICATIONS

[see Appendix A]: G. Wobeser, T. Bollinger, A. Neimanis, and **K.B. Beckmen** (2009) **DERMOID CYSTS IN CARIBOU.** Journal of Wildlife Diseases 45 (2) 505-507.

[see Appendix B] Lori Quakenbush, **Kimberlee Beckmen** and Charles D. N. Brower (2009) **Rehabilitation and release of marine mammals in the United States: Concerns from Alaska.** Marine Mammal Science.

V. RECOMMENDATIONS FOR THIS PROJECT

Disease surveillance and veterinary activities have steadily increased in scope and intensity over the course of this performance period. The Wood Bison Reintroduction Project animals under quarantine and the orphan moose added at tremendous amount of work that was not previously anticipated. To continue to provide wildlife veterinary services at the level currently expected, staffing levels and funding must be increased as well as a decrease in some duties. Federal funding of CWD surveillance continues to decrease and it is no longer sufficient to maintain adequate surveillance of free-ranging cervids in Alaska. Likewise, funding for West Nile Virus surveillance is no longer available for Alaska. These deficiencies will need to be mitigated by other funding sources including Federal Aid. Additional field and captive studies testing the effects of diseases and parasites on wildlife health are needed to understand the role of these factors on populations so they can be manipulated as needed for management purposes.

VI. APPENDIX

Appendix A and B are attached.

PREPARED BY:

Kimberlee Beckmen
Wildlife Veterinarian

SUBMITTED BY:

-type name-
Kim Titus
Wildlife Scientist

APPROVED BY:

Clayton Hawkes
Federal Assistance Coordinator
Division of Wildlife Conservation

____
Douglas N. Larsen, Director
Division of Wildlife Conservation

APPROVAL DATE: __________________