

IDAHO DEPARTMENT OF FISH AND GAME

Steven M. Huffaker, Director

Project W-179-R-3

Progress Report



WILDLIFE HEALTH LABORATORY

Study I, Job 1

July 1, 2003 to June 30, 2004

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**ANNUAL PERFORMANCE REPORT
IDAHO DEPARTMENT OF FISH AND GAME**

GRANT NUMBER: W-179-R

SEGMENT NUMBER: 3

GRANT TITLE: Wildlife Health Laboratory

AGREEMENT PERIOD: July 1, 2003 to June 30, 2004

ABSTRACT

During the 2003-2004 project year, the Idaho Department of Fish and Game's (IDFG) Wildlife Health Laboratory (WHL) in Caldwell, Idaho, was actively involved in the collection of biological data in support of wildlife management within the state and in research projects concerning various aspects of wildlife health. More than 2,300 biological samples from a variety of wildlife species were collected and analyzed for serology, complete blood counts, serum chemistries, bacteriology, virology, parasitology, and toxicology. These samples represented over 44 species of animals including bighorn sheep, mule deer, moose, elk, black bear, mountain lion, wild turkey, waterfowl, raptors, and other birds. Necropsies were performed on 284 animals to determine cause of death. The Enforcement Bureau submitted 25 cases to the Forensics Laboratory. Several papers and abstracts were submitted for publication, including papers written and submitted in conjunction with individuals at the Caine Veterinary Teaching and Research Center and the Hells Canyon Initiative. Biological samples were collected from wildlife in several states (Nevada, Montana, Oregon, Colorado, Utah, and Washington) to assist these wildlife agencies in screening wildlife species for disease. WHL personnel offered three animal restraint and drug handling courses for biologists and officers of IDFG, in addition to personnel from the Idaho Department of Agriculture (ISDA) and other state wildlife and law enforcement agencies. WHL personnel were involved in disease investigations and multi-agency research projects with the University of Idaho; Oregon Department of Fish and Wildlife; U.S. Department of Agriculture Animal and Plant Health Inspection Service; National Veterinary Services Laboratory, Iowa; Texas A&M University; U.S. Forest Service; U.S. Bureau of Land Management; and Wyoming Department of Game and Fish.

OBJECTIVE

The primary objective and first priority of the WHL has been to provide support for the wildlife management and research activities of the IDFG, Bureau of Wildlife (BOW), and forensics for the Bureau of Enforcement. Monitoring of all wildlife populations for disease and disease exposure is the major function of the WHL in these activities. Directing and implementing wildlife health and disease research are secondary objectives of the WHL. The WHL services provided have management and research applications; therefore, data obtained from WHL analyses are reported to the wildlife managers, researchers, and other state and federal agencies. Information is disseminated on disease issues in the western states by active participation in the Western Wildlife Health Cooperative. In addition, the WHL houses the forensic lab biologist and supports the Bureau of Enforcement through casework requiring expertise with DNA techniques and equipment.

WILDLIFE TOOTH AGING

During 2003-2004, the WHL received approximately 78 wildlife teeth. The regional offices submitted teeth from big game species including 77 mule deer and one elk tooth that was submitted through the BOW. The WHL received the batches of teeth for entry into a Microsoft Excel file containing Big Game Mortality Report form numbers or other identifying numbers. Additional information recorded included species, IDFG region, sex, and kill date of animal. All teeth were sent to Matson's Laboratory, Milltown, Montana, for dental cementum analysis to determine age of each specimen. Age information was reported to the regions, allowing respective research and management biologists to analyze age structure of the population. All age information was also stored at the WHL to assist big game hunters requesting the age of the animal they harvested.

RIVER OTTER CARCASSES

The WHL makes storage and workspace available to the BOW for river otter carcasses. Trappers were mandated to surrender the entire river otter carcass to the Department within 72 hours of harvest. A two-year graduate research project is currently utilizing the carcasses for analyses of toxin levels, reproductive rates, age and sex structure, and general information on the overall status of the state's river otter population. River otter canine teeth are sent to Matson's Laboratory, Milltown, Montana, where cementum annuli are counted to determine the age of the animal. All of the collected data is provided to the U.S. Fish and Wildlife Service's Division of Scientific Authority (DSA) for assessment of the issuance of CITES export pelt tags for river otters harvested in future trapping seasons.

DISEASE DATA COLLECTION

Biological Samples

One of the primary objectives of the WHL is to establish baseline data on diseases in wildlife populations. Disease agents can be present in individuals or within a population without showing any significant signs or effects of disease. As environmental and population conditions change with time, the significance of disease can shift and can become of concern to wildlife biologists. Factors that influence disease processes including trace mineral levels, stress, loss of habitat, and human interactions must also be considered in situations involving any disease process. Our objective is to establish baseline data on the various wildlife populations in Idaho and to monitor the health of these populations, through time, with continued sampling and analyses.

During the 2003-2004 project year, several important wildlife health issues were investigated. The presence of Brucellosis in elk in eastern Idaho was monitored and a variety of management options were discussed to deal with this disease. Trapping and testing of elk was done in eastern Idaho. During the project year, 105 elk were tested; 101 tested negative and 4 elk tested positive.

Baseline data was collected from mule deer, pronghorn, and bighorn sheep in several locations across the state.

Chronic Wasting Disease has been an important topic nationwide this project year. During the 2003-2004 project year, Department personnel collected 863 brain samples from elk, mule deer, and white-tailed deer. These samples were collected primarily from hunter check stations and some road kills or necropsies throughout the state of Idaho. During the upcoming project year, the WHL plans to continue the surveillance program at hunter check stations, taxidermists, and butchers throughout the state.

West Nile virus (WNV) surveillance was conducted in cooperation with the Idaho Department of Health and Welfare and the ISDA as in past years. Targeted surveillance was done on corvids and raptors. Approximately 60 birds were tested; all were negative. Surveillance efforts will continue for the next several years as WNV becomes established in the state.

During the 2003-2004 project year, WHL personnel processed more than 2,300 biological samples from wildlife throughout the state. Samples were collected for complete blood count (hematology), serology, serum chemistry, viral and bacterial isolation (virology and bacteriology), mycoplasmosis and internal and external parasites (parasitology), toxicology, and genetic projects.

Necropsies

There were a total of 284 animals necropsied during the project year 2003-2004. The species examined included: antelope, bald eagle, bat, bighorn sheep, bison, bobcat, Canadian goose, cedar waxwing, cinnamon teal, cougar, crow, domestic cow, domestic sheep, dove, duck, eared grebe, elk, finch, fox, fox squirrel, gadwall, golden eagle, goshawk, great blue heron, great horned owl, grosbeak, ground squirrel, moose, mule deer, osprey, peregrine falcon, pocket gopher, pygmy rabbit, raccoon, raven, red-tailed hawk, river otter, sage-grouse, sparrow, Swainson's hawk, trumpeter swan, turkey, turkey vulture, waterfowl, white-tailed deer, and Wilson's phalarope.

Necropsy results on songbirds indicated diseases associated with bird feeders, including Salmonellosis and Trichomoniasis. Waterfowl mortality diagnosed by the WHL included botulism, organophosphate intoxication, and feed impaction.

The most common cause of bighorn sheep mortality diagnosed by the WHL was acute bronchopneumonia caused by *Pasteurella multocida*, *Mannheimia (Pasteurella) haemolytica*, and *Mannheimia (Pasteurella) trehalosi*.

FORENSIC TESTING

The forensic biologist handled 25 cases with over 130 evidence items submitted by conservation officers throughout the state. Forensic testing can be done for all big game animals to determine family and species identification of blood and meat evidence. The gender of all big game animals was determined on samples of blood, meat, and hair using DNA technology. The DNA

matching test was used to determine if mule deer samples, such as those from a gut pile, and seized frozen meat, are from the same individual. Other big game matching analyses, including elk and bear, are now available to the conservation officers for casework. Cause of death and X-ray analysis for presence of lead was also conducted.

RESEARCH ACTIVITIES

Research continued to be an important objective of the WHL. Numerous projects are in progress or in various stages of completion. Currently, all research projects that use live animals must follow the protocols and Animal Care and Use Guidelines of the University of Idaho.

A contraception study on female bison was started in June 2002 at the WHL. Six individually identified adult female bison received GnRH vaccine intramuscularly and five received a sham vaccine (sterile water and adjuvant) in June 2002. Blood samples were collected monthly for four months and every two months thereafter. Samples were tested for antibody titers to GnRH at the USDA VS lab in Fort Collins, Colorado. All cows were exposed to a male from July to September and, at present, all control animals are pregnant and five of six vaccinated bison are open. All bison cows, 2003 calves and 2002 bulls were shipped to the USDA Research facility in Fort Collins, Colorado, in March 2004.

A project encompassing long-term monitoring of bighorn sheep that have had contact with domestic livestock was completed in March 2004. A total of 12 sheep that had some level of contact with domestic livestock were captured over a three-year period. All sheep were sampled on the day of arrival and at regular intervals for up to three years to determine if disease agents from the domestic livestock were present and the persistence of these agents. Data analysis will be done in summer 2004. All sheep involved in the project were euthanized by March 2004.

A project to determine risk factors for disease in bighorn sheep was started. A 30-year dataset from a herd of bighorn from Lostine, Oregon, was obtained and the data entered into a Microsoft Access database. Data are currently being evaluated via a risk analysis technique at the University of California-Davis. Results are expected to be completed by fall 2004.

A disease survey of domestic goats (pack goats and herd goats) in the Hells Canyon area was done to try to obtain data on the health profile of goats under different management conditions and to delineate any potential disease concerns for bighorn sheep. A total of 93 animals were sampled and data analysis was completed in March 2004.

An ongoing project to determine the epidemiology of Brucellosis within the elk and bison housed at the WHL is complete. After completion of the strain 19 vaccine trial in elk at the WHL in July 2002, a small number of elk and bison seroconverted to Brucellosis. One animal was culture positive to the same strain of Brucellosis used in the elk vaccine trial. Efforts to determine how the bacteria went from the vaccine trial elk to resident bison and elk is ongoing. All animals involved in the study were euthanized and sampled.

A molecular DNA project was undertaken at the WHL to provide genetic profile data using noninvasive sampling techniques for a black bear population estimate study being carried out in

the Southwest Region. The black bear study included 200 hair or tissues samples to be analyzed in the first year of a long-term monitoring project.

A two-year graduate research project is in its second year of collecting river otter carcasses for analyses of toxin levels, reproductive rates, age and sex structure, and general information on the overall status of the state's river otter population.

ANIMAL RESTRAINT AND DRUG USE CLASSES

WHL personnel are responsible for instructing and certifying biologists and conservation officers in capture techniques using both physical and chemical restraint. These classes are required to use the controlled drugs, and re-certification of personnel is required every two years. Over 50 IDFG personnel were certified through three training classes in 2003-2004. The WHL also offered the course to outside agencies which included ISDA and several law enforcement agencies.

ANIMAL CARE

WHL personnel are responsible for providing care to the animals kept at the WHL. For the project year 2003-2004, WHL personnel cared for 30 elk, 26 bison, and 26 bighorn sheep.

LIAISON WITH OTHER AGENCIES

The WHL has worked with other state, federal, and private organizations on wildlife health issues. WHL personnel are on the Technical Advisory Committee and the Education and Information Subcommittee for the Greater Yellowstone Interagency Brucellosis Committee. This committee is a multidisciplinary task force of state and federal agencies dedicated to eradicating the disease in the Greater Yellowstone area bison and elk.

There was WHL representation on the Western Association of Fish and Wildlife Agencies' Wildlife Disease Committee (Western Wildlife Health Committee). This representation is to help keep state wildlife directors informed of disease issues in wildlife and to coordinate disease surveillance and dissemination of current disease problems in the western USA.

The WHL is also involved with the U. S. Animal Health Association. Membership is maintained on the Captive Wildlife Committee, the Brucellosis Committee, and the Wildlife Disease Committee. These committees help to keep federal and state regulatory agencies informed of wildlife issues and their relationship with livestock diseases.

Strong affiliations are also in place with the University of Idaho, Washington State University, Boise State University, and Texas A&M. These affiliations help the WHL direct and collaborate on research projects as they pertain to wildlife health. In addition, the WHL has worked cooperatively with the National and Idaho Chapter of the Foundation of North American Wild Sheep. WHL personnel also work with the Peregrine Fund and its activities in monitoring birds and nest sites.

ABSTRACTS AND PUBLICATIONS

WHL personnel collaborated on several publications and presented abstracts at scientific meetings during the project year.

Peer-reviewed Publications

- Drew, Mark L., T. Kreeger, K. Waldrup, C. Macintosh. 2004. Pharmacokinetics of ceftiofur in red deer delivered by intramuscular and ballistic implant routes. *Journal of Veterinary Pharmacology and Therapeutics*, 27(1):7-11.
- Drew, Mark L., L. Johnson, D. Pugh, A. Craigmill. 2004. Pharmacokinetics of ceftiofur in alpacas and llamas. *Journal of Veterinary Pharmacology and Therapeutics*, 27(1):13-20.
- Drew, Mark L., R. Etter. Brucellosis in elk (*Cervus elaphus*) in eastern Idaho. *Journal of Wildlife Diseases*, *in review*.
- Drew, Mark L., V. N. Bleich, S. Torres and J. N. Weyhausen. Theoretical reproductive performance for desert mountain sheep in California, *in preparation*.
- Rudolph, K. M., D. L. Hunter, W. J. Foreyt, E. F. Cassirer, and A. C. S. Ward. 2003. Sharing of *Pasteurella* spp. between free-ranging bighorn sheep and feral goats. *Journal of Wildlife Diseases*, 39(4):897-903.
- Rudolph, K. M., D. L. Hunter, R. B. Rimler, E. F. Cassirer, W. J. Foreyt, W. J. DeLong and A. C. S. Ward. Micro-organisms associated with a bighorn sheep pneumonia epizootic in Hells Canyon, Idaho, USA, *submitted*.

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FEDERAL AID IN WILDLIFE RESTORATION

The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sale of handguns, sporting rifles, shotguns, ammunition, and archery equipment. The Federal Aid program then allots the funds back to states through a formula based on each state's geographic area and the number of paid hunting license holders in the state. The Idaho Department of Fish and Game uses the funds to help restore, conserve, manage, and enhance wild birds and mammals for the public benefit. These funds are also used to educate hunters to develop the skills, knowledge, and attitudes necessary to be responsible, ethical hunters. Seventy-five percent of the funds for this project are from Federal Aid. The other 25% comes from license-generated funds.

