

IDAHO DEPARTMENT OF FISH AND GAME

Jerry Mallet, Interim Director

Project W-170-R-23

Job Progress Report



WILDLIFE HEALTH LABORATORY

Study V: Wildlife Surveys and Inventories

Job 1: Wildlife Laboratory

July 1, 1998 to June 30, 1999

By:

Mark Drew, D. V. M.

Karen Rudolph, Ph.D.

Julia Mulholland

Mary Ann Clemens

Sandra Shewmaker

September 1999

Boise, Idaho

Findings in this report are preliminary in nature and not for publication without permission of the Director of the Idaho Department of Fish and Game.

The Idaho Department of Fish and Game adheres to all applicable state and federal laws and regulations related to discrimination on the basis of race, color, national origin, age, sex, or handicap.

If you feel you have been discriminated against in any program, activity, or facility of the Idaho Department of Fish and Game, or if you desire further information, please write to: Idaho Department of Fish and Game, 600 S. Walnut, Box 25, Boise, ID 83707; OR the Office of Human Resources, U.S. Fish and Wildlife Service, Department of the Interior, Washington, DC 20240.

**PROGRESS REPORT
SURVEYS AND INVENTORIES**

STATE: Idaho **JOB TITLE:** Wildlife Laboratory
PROJECT: W-170-R-23
SUBPROJECT: Lab **STUDY NAME:** Wildlife Surveys and Inventories
STUDY: V
JOB: 1
PERIOD COVERED: July 1, 1998 to June 30, 1999

ABSTRACT

During the 1998-1999 project year, the Idaho Department of Fish and Game (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. The WHL processed approximately 3,153 teeth for age analysis including 65 ungulates, 785 bobcats, and 2,303 black bear. More than 475 biological samples from a variety of wildlife species were collected and analyzed for serology, complete blood counts, serum chemistries, bacteriology, virology, parasitology, and toxicology. Nearly 20 species of animals were sampled including California bighorn sheep, Rocky Mountain bighorn sheep, mule deer, white-tailed deer, moose, elk, black bear, mountain lion, duck, goose, wild turkey, waterfowl, raptors, and other birds. Necropsies were performed on 28 animals to determine cause of death. The Enforcement Bureau submitted 12 cases to the Forensics Laboratory. Several papers and abstracts were submitted for publication in conjunction with individuals at the Caine Veterinary Teaching and Research Center, American Association of Wildlife Veterinarians, and the Wildlife Disease Association Conference. Biological samples were collected from wildlife in several states (North Dakota, Nevada, Montana, Oregon, Utah, and Washington) and Yellowstone National Park to assist these wildlife agencies in screening wildlife species for disease. WHL personnel are certified to run brucellosis and meningeal worm assays on wildlife species. WHL personnel offered the animal restraint and drug handling course for biologists and officers of IDFG; US Department of Agriculture, Animal Plant Health Inspection Service, Wildlife Services; National Park Service; Caine Veterinary Teaching Center; veterinarians, and other state wildlife agencies. WHL personnel are involved in disease investigations and multi-agency research projects with Oregon Fish and Wildlife; Washington Department of Wildlife; U.S. Department of Agriculture, Animal and Plant Health Inspection Service; National Biological Research Division, Montana; National Veterinary Services Laboratory, Iowa; Texas A&M University; and Wyoming Department of Fish and Game.

OBJECTIVE

The primary objective and first priority of the Wildlife Health Laboratory (WHL) has been to provide support for the wildlife management and research activities of the Bureau of Wildlife.

Monitoring of all wildlife populations for disease and disease exposure is also a function of the WHL. Directing and implementing wildlife health and disease research has also become a major objective of the lab. Laboratory services provided have management and research applications; therefore, data obtained from lab 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 our forensic lab biologist and supports the Bureau of Enforcement through casework requiring laboratory equipment and expertise.

WILDLIFE TOOTH AGING

During 1998-1999 the WHL received approximately 3,153 wildlife teeth. The regional offices submitted teeth from big game species including 65 mule deer. The WHL received the batches of teeth for entry into a dBase file containing Big Game Mortality Report form number, or other identifying number. 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.

Bobcat Jaw and Tooth Collections

Following the December 1998 bobcat season, trappers were required to submit a lower jaw from each bobcat having a pelt tagged. These mandibles were boiled to allow extraction of canines for age and sex determination. By visual inspection the presence of milk teeth or an open-ended root canal indicated a juvenile cat. Those animals having a closed root canal were aged as adult cats. The lingual to buccal width of each canine was gauged to determine sex of the animal. Statistically, the female canines were those measuring less than 5.40 mm at maximum root width. Typical male canines measure 5.40 mm or greater. Pertinent data is entered onto computer files. A total of 785 teeth were evaluated by dental cementum analysis at Matson's Laboratory in Milltown, Montana. The information obtained will be analyzed to monitor efficacy of trapping regulations.

Black Bear Tooth Processing

The Idaho Department of Fish and Game elected to continue compiling relevant information for black bear management. Black bear hunters were required to present a skull for collection of a premolar, and a mortality report form was completed. Bear teeth collected during the spring and fall seasons were received at the WHL. Identifying numbers were recorded on the database file along with date of kill and sex of animal. The statewide sample of teeth was shipped to Matson's Laboratory for dental cementum analysis to determine age of each animal. From the statewide bear harvest, 2,303 teeth were submitted. Of those animals, 777 were harvested in the spring and

1,526 were harvested in the fall. Age information is forwarded to each region submitting teeth, and used by Wildlife personnel to assess age structure of the population.

DISEASE DATA COLLECTION

Biological Samples

Samples were collected for complete blood count (hematology), serology, serum chemistry, viral and bacterial isolation (virology and bacteriology), mycoplasma, and internal and external parasites (parasitology).

During the 1998-1999 project year, WHL personnel processed over 475 biological samples from wildlife throughout the state. It is necessary to establish baseline data on populations in order to determine what is "normal" for that population. Potential disease agents can be present in a population without showing any significant signs of disease. As environmental and population conditions change with time, the significance of these organisms and agents can shift and these agents can become pathogens 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. Two important health issues for the 1998-1999 fiscal year included identification of elk in southeast Idaho with titers to *Brucella abortus*, and the collection of baseline data for capture and transplant of bighorn sheep to Idaho as part of the Hells Canyon Initiative.

Necropsies

The WHL personnel have received 28 animals for necropsy during 1998-1999. The species examined included: moose; white-tailed deer; mule deer; bison; elk; wild turkeys; Rocky Mountain, Desert, and California bighorn sheep; waterfowl; foxes; great horned owls; mountain lions; hummingbirds; cougar; gulls; trumpeter swans; tundra swans; songbirds; mountain goats; and muskrats.

Necropsy results on songbirds indicated diseases associated with bird feeders including Salmonellosis and Trichomoniasis.

The most common cause of waterfowl mortality diagnosed by the WHL was botulism. A significant episode of botulism occurred in the Southeast Region in 1997, 1998, and 1999.

The most common cause of bighorn sheep mortality diagnosed by the WHL was acute bronchopneumonia caused by *Pasteurella multocida*, *Pasteurella haemolytica*, and *Pasteurella trehalosi*. There were several bighorn sheep necropsies in which cause of death was unknown. It appeared that the undetermined deaths were caused by a large predator attack, suspected mountain

lion or cougar; however, samples were taken from the bighorn sheep to assess the presence of *Pasteurella*.

Three female elk that were part of a vaccine trial at the lab were necropsied. One elk died of a fractured neck sustained shortly after arrival at the lab. The other two died of chronic problems related to previous traumatic injuries.

The WHL, in conjunction with the Nevada Division of Wildlife, performed necropsies on several mule deer from Nevada from populations that were undergoing poor recruitment, diarrhea, and lameness. Results of the necropsies and lab tests are still pending.

FORENSIC TESTING

The WHL offered the DNA gender-based typing test for elk, mule deer, and bighorn sheep. Additional species will be added, starting with white-tailed deer. The WHL received 12 forensic cases in 1998-1999. Gender-based typing tests and species identification tests were used in support of enforcement activities. At present 5 cases are still outstanding, 4 resolved with guilty pleas, and 3 cases went to court.

RESEARCH ACTIVITIES

Animal research has continued at the WHL to identify bighorn sheep that are naturally resistant to *Pasteurella* infection. The study involves using molecular DNA procedures to identify animals that carry the resistant form of a gene called Nramp. The WHL has collected dozens of DNA samples from bighorn sheep, in part from the collaboration with Hells Canyon Initiative, and amplified the region with the Nramp gene. In addition, the WHL has collaborated with several investigators to establish the numbers of alleles that comprise the Nramp gene in bighorn sheep. The next step will be to identify bighorn sheep with the different alleles and subject them to a disease challenge to determine if any of the alleles are protective against pasteurellosis

A research project was carried out to determine the safety of a *Brucella* vaccine in 35 seronegative pregnant bison. The project was done at the WHL in collaboration with the Caine Veterinary Teaching and Research Center and other state and federal agencies. The cows have been sent to Texas A&M for the challenge portion of the study, while the calves have remained here for further brucellosis research projects. The data was collected and has been prepared for submission to a peer-reviewed journal.

ANIMAL RESTRAINT AND DRUG USE CLASSES

The 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 recertification of personnel is required every two years. Over 100 IDFG personnel were certified through 3 training classes in 1998-1999.

ANIMAL CARE

The WHL personnel are responsible for providing care to the animals kept at the Wildlife Health Laboratory. For the project year 1998-1999, the lab personnel cared for:

DEER	2 mule deer
ELK	78 elk
BISON	20 bison
BIGHORN SHEEP	5 Rocky Mountain Bighorn Sheep

LIAISON WITH OTHER AGENCIES

The WHL has worked with other state, federal, and private organizations on wildlife health issues. Laboratory personnel are on the Technical Advisory Committee 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 International Association of Fish and Wildlife Agencies' Wildlife Disease Committee. This representation is to help keep state wildlife directors informed of disease issues in wildlife.

The WHL is also involved with the Wildlife Committee at the U. S. Animal Health Association. This committee helps keep the federal 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.

Joint research with the Colorado Division of Wildlife and Colorado State University is currently active. This research is directed at diseases and vaccinations of bighorn sheep.

The WHL is involved with U.S. Department of Agriculture; Animal and Plant Health Inspection Service; National Biological Research Division; National Veterinarian Services Laboratory; and Montana Division of Fish, Wildlife & Parks on a brucellosis project within Yellowstone National Park.

Idaho has been instrumental in developing a Western Wildlife Health Cooperative to disseminate information on diseases in the western U.S.

WHL personnel have also worked with the Peregrine Fund and its activities in monitoring birds and nest sites.

In addition, the WHL has worked cooperatively with the Foundation of North American Wild Sheep (FNAWS).

ABSTRACTS AND PUBLICATIONS

The WHL personnel collaborated with several publications and presented abstracts at scientific meetings.

Peer-reviewed Publications:

Hunter, D. L., L. M. Cowan, K. M. Rudolph, and A. C. S. Ward. 1998. Transmission of *Pasteurella haemolytica* between free-ranging bighorn and domestic sheep. *Journal of Wildlife Management*. In press.

Rudolph, K. M., D. L. Hunter, W. J. Foreyt, E. F. Cassirer, and A. C. S. Ward. 1998. Sharing of *Pasteurella* spp. between free-ranging bighorn and feral goats. *Journal of Wildlife Management*. In review.

Ward, A. C. S., M. D. Jaworski, D. L. Hunter, P. L. Benolkin, M. P. Dobel, J. B. Jeffress, G. A. Tanner.. 1998. Evaluation of *Pasteurella* isolates from bighorn and domestic sheep on range conditions. *Journal of Wildlife Disease*. In Press

Presentations at Scientific Meetings:

Rudolph, K. M. 1998. Sharing *Pasteurella* spp. between free-ranging bighorn sheep and feral goats presented at the Northern Wild Sheep and Goat Council, April 25-29.

Submitted by:

Mark Drew

Mark Drew, D. V. M.
Wildlife Veterinarian

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

John Beecham

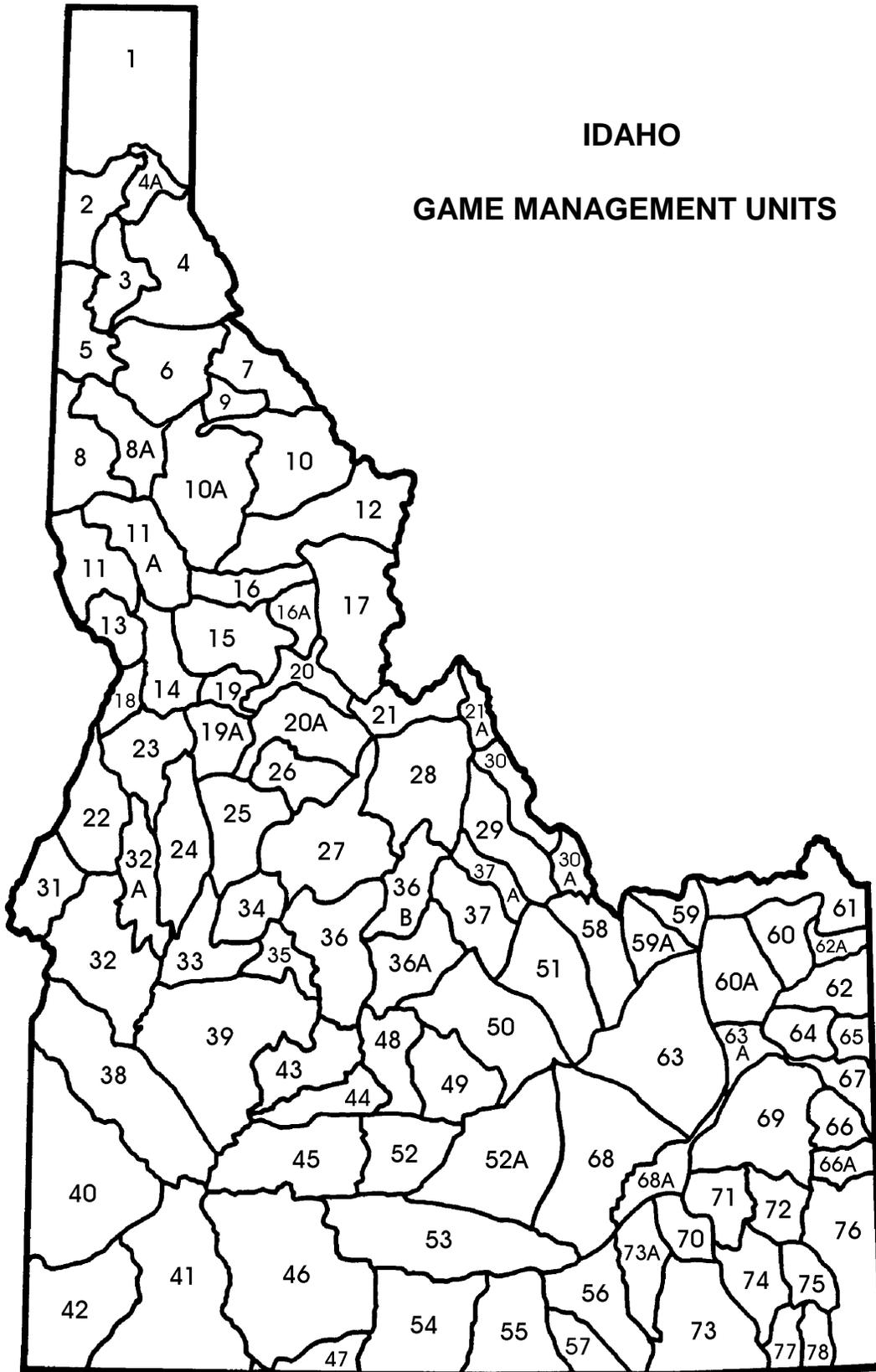
John Beecham
Wildlife Game and Research Manager
Federal Aid Coordinator

Steven M. Huffaker

Steven M. Huffaker, Chief
Bureau of Wildlife

IDAHO

GAME MANAGEMENT UNITS



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.

