

IDAHO DEPARTMENT OF FISH AND GAME

Steven M. Huffaker, Director

Project W-179-R-5

Progress Report



WILDLIFE HEALTH LABORATORY

Study I, Job 1

July 1, 2005 to June 30, 2006

Prepared by:

Mark Drew, D. V. M.

Phil Mamer, D. V. M.

Julia Mulholland

Stephanie Moran

Karen Rudolph, Ph.D.

September 2006

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Findings in this report are preliminary in nature and not for publication without permission of the Director of the Idaho Department of Fish and Game.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, gender, 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, PO Box 25, Boise, ID 83707; or the Office of Human Resources, U.S. Fish and Wildlife Service, Department of the Interior, Washington, DC 20240.

This publication will be made available in alternative formats upon request. Please contact the Idaho Department of Fish and Game for assistance.

TABLE OF CONTENTS

ABSTRACT.....	1
OBJECTIVE.....	1
DISEASE DATA COLLECTION.....	2
BIOLOGICAL SAMPLES AND ANIMAL CAPTURE.....	2
NECROPSIES.....	3
FORENSIC TESTING.....	3
RESEARCH ACTIVITIES.....	4
CHEMICAL IMMOBILIZATION TRAINING.....	4
LIAISON WITH OTHER AGENCIES.....	4
ABSTRACTS AND PUBLICATIONS.....	5
PEER-REVIEWED PUBLICATIONS.....	5

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

GRANT NUMBER: W-179-R

SEGMENT NUMBER: 5

GRANT TITLE: Wildlife Health Laboratory

AGREEMENT PERIOD: July 1, 2005 to June 30, 2006

ABSTRACT

During the 2005-2006 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 and research with regard to various aspects of wildlife health. More than 3,653 biological samples from a variety of wildlife species were collected for serology, complete blood counts, serum chemistries, bacteriology, virology, parasitology, and toxicology. These samples represented over 45 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 282 animals to determine cause of death. The Enforcement Bureau submitted 22 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 bighorn sheep in other states (Oregon and Washington) to assist these wildlife agencies in assessing these animals for the presence of disease agents. WHL personnel offered 3 animal restraint and drug handling courses for IDFG biologists and officers as well as personnel from city, county, state, and federal agencies in Idaho. WHL personnel were involved in disease investigations and multi-agency research projects with the University of Idaho, Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife, U.S. Department of Agriculture Animal and Plant Health Inspection Service, Idaho State Department of Agriculture, and Idaho Department of Health and Welfare.

OBJECTIVE

The primary objective of WHL is to provide support for the wildlife management and research activities of the IDFG Wildlife Bureau personnel. Health assessment and disease surveillance of all wildlife populations is the major function of WHL in these activities. The second objective of WHL is to direct and implement wildlife health and disease research. The services provided by WHL have management and research applications; therefore, data obtained from WHL analyses are reported to 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 Association of Fish and Game Agencies, Western Wildlife Health Committee. In addition, WHL houses the forensic lab biologist for the Bureau of Enforcement who provides expertise for enforcement cases requiring DNA techniques and equipment.

DISEASE DATA COLLECTION

Biological Samples and Animal Capture

Pathogens can be present in individuals or within a population without showing any significant signs of disease. As environmental and population conditions change with time, the significance of pathogens change. Factors that influence disease processes including nutrition, trace mineral levels, stress, habitat quantity and quality, and human interactions must be considered in evaluation and management of disease in wildlife. One of the primary objectives of WHL is to establish baseline data on diseases and disease exposure in wildlife populations and to monitor the health of these populations, through time, with continued sampling and analyses.

During the 2005-2006 project year, several wildlife health issues were investigated. Surveillance of elk in eastern Idaho for brucellosis was continued and a variety of management options were discussed to deal with this disease. Because of weather and change in elk management in eastern Idaho, only a small number of elk were trapped in eastern Idaho in the project year.

During the 2005-2006 project year, WHL personnel processed more than 3,653 biological samples collected from wildlife throughout the state. Samples were collected for complete blood counts (hematology), serology, serum chemistry, virology, bacteriology, Mycoplasmosis, internal and external parasites, and toxicology.

Health assessments were conducted for bighorn sheep that were part of capture operations in Hells Canyon. Sheep were caught in the Hells Canyon area of Idaho, Oregon, and Washington where a total of 62 sheep were sampled for disease agents. Biological samples collected included blood, feces, oropharyngeal swabs, and ear swabs.

The ungulate ecology project initiated by IDFG in 2004 was continued during this project year. A total of 563 elk and deer were captured, sampled, marked and released. Health assessment included collection of blood and feces from each individual captured. General health assessment indicated no pathogens of significance.

Chronic Wasting Disease has been an important topic nationwide for a number of years. During 2005-2006, Department personnel collected 1,258 brain and lymph node 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, WHL plans to continue the surveillance program at hunter check stations throughout the state.

Wild turkeys were trapped and translocated in the Panhandle and Clearwater regions. Birds were trapped, marked, and sampled for disease exposure. A total of 389 birds were sampled for disease exposure.

Wolf capture was initiated in Idaho using physical capture techniques and helicopter darting. Drug protocols were developed and biological samples (blood and feces) were obtained from 4 individuals captured by helicopter darting and 6 trapped animals during the project year.

Assistance was provided for IDFG and University of Idaho personnel involved in trapping black bear and grizzly bear in the Panhandle. Drug delivery and chemical immobilization protocols were developed to provide safe and effective handling of these animals.

Necropsies

There were a total of 282 animals necropsied during 2005-2006. The species examined included: barn owl, crow, robin, raccoon, bighorn sheep, red-tailed hawk, sage grouse, cottontail rabbit, mule deer, English starling, elk, white-tailed deer, kestrel, hawk, moose, great horned owl, duck, golden eagle, squirrel, black bear, magpie, trumpeter and tundra swan, skunk, Canada geese, flammulated owl, pronghorn, turkey, mountain lion, siskin, finch, mourning dove, wolf, and screech owl.

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

The most common cause of bighorn sheep mortality diagnosed by WHL was acute bronchopneumonia caused by *Pasteurella multocida*, *Mannheimia (Pasteurella) haemolytica*, and *Mannheimia (Pasteurella) trehalosi*. Other mortality factors identified included gunshot (poaching), predation, and other disease processes including Mycoplasmosis in several sheep from the Lost River Range east of Mackay, Idaho.

Wolf necropsies indicated the presence of lice (*Trichodectes canis*) previously undetected in the species in the state. In addition, 1 mountain goat and several mule deer and elk were found to have hydatid cysts in the lungs (*Echinococcus granulosa*), likely with wolves as the definitive host of this previously unrecognized parasite in the state.

A significant number of corvids (magpies, crows, ravens) and raptors of many species were found to be infected with West Nile Virus (WNV). The virus was initially found in wild birds in Idaho in 2003 but has remained relatively geographically stationary in the southwestern part of the state. In spring 2006, the virus increased its range within the state dramatically and, by the end of the 2005-2006 project year, was found in most counties south of Salmon River.

FORENSIC TESTING

The forensic biologist handled 22 cases submitted by conservation officers throughout the state. We have accomplished our goal of providing a full service forensic DNA testing program for IDFG. Family and species identification of blood and meat evidence is available for all big game animals. Gender determination using DNA technology is available for all big game animals on submitted evidence samples of blood, meat, hair, bone, and antler. Individual identification (or the DNA matching test) is now available for blood, meat, hair, bone, and antler samples from mule deer, white-tailed deer, elk, moose, and black bear. Cause of death and X-ray analysis for presence of lead was conducted.

RESEARCH ACTIVITIES

Research continues to be an important objective of WHL. Numerous projects are in progress or in various stages of completion.

The WHL cooperated on statewide research projects in mule deer ecology, predator ungulate ecology, and bighorn sheep survival. The animals were captured using a variety of methods including net gunning, darting, and mugging on drive-net operations. Animals were radio-collared, ear-tagged, measured, evaluated for health status, and sampled depending on the capture protocols.

A project to investigate the species composition, population levels, and distribution of *Culicoides* spp. gnats in the Clearwater Valley of central Idaho was started in 2004 and completed in 2005. At present, 8 species of *Culicoides* spp. were identified by personnel at Montana State University in Bozeman, including the species believed to be responsible for transmission of Epizootic Hemorrhagic Disease and Bluetongue in white-tailed deer and domestic sheep, respectively. Population peaks were found in July, August, and September. Final data analysis is currently underway in preparation for publication of the results.

A pilot project to evaluate the potential impact of WNV on raptor species in southwestern Idaho was initiated in spring and summer 2005. Oral swabs and blood were collected from kestrels, barn owls, and Swainson's hawks for determination of exposure to and infection with WNV in cooperation with the USGS Raptor Research Unit at Boise State University and the USGS National Wildlife Health Laboratory in Madison, Wisconsin. A total of 9/72 samples from kestrels, barn owls, and Swainson's hawks were found to have titers to WNV in both adults and young of the year. The project was continued in spring and summer 2006.

CHEMICAL IMMOBILIZATION TRAINING

WHL personnel are responsible for instructing and certifying biologists and conservation officers in capture techniques using chemical restraint. Certification for use of controlled substances is required of IDFG personnel every 2 years. Over 32 IDFG personnel were certified through 3 training classes in spring 2006. The course was open to outside agencies which included Idaho State Department of Agriculture and several city and county law enforcement agencies.

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 and the Information and Education committees for the Greater Yellowstone Interagency Brucellosis Committee (GYIBC). The GYIBC is a multi-agency task force of state and federal personnel that meets to enhance inter-agency communication and work towards eradication of brucellosis in bison and elk in the Greater Yellowstone area.

A WHL veterinarian represented IDFG on the Western Wildlife Health Committee of the Western Association of Fish and Wildlife Agencies. This committee provides information to the

agency directors about 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 for 2 WHL veterinarians on the Captive Wildlife, Brucellosis, and Wildlife Disease committees. These committees provide discussion forums for agency and the public on specific topics and provide information for federal and state regulatory agencies on wildlife disease issues and their relationship with livestock diseases.

Strong affiliations are also in place with the University of Idaho, Washington State University, and Boise State University. These affiliations help WHL direct and collaborate on research projects on wildlife health. In addition, WHL has worked cooperatively with the National and Idaho Chapter of the Foundation of North American Wild Sheep (FNAWS). 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 during the project year. WHL personnel made presentations on IDFG/WHL projects and research at the 2005 United State Animal Health Association Meeting and the Wildlife Disease Association Meeting.

Peer-reviewed Publications

DREW, M. L., AND G. C. WEISER. Disease survey of domestic goats and their potential relationship to disease in bighorn sheep. In preparation.

DREW, M. L., AND G. C. WEISER. Long term monitoring of bighorn sheep in contact with domestic livestock. In preparation.

ETTER, R., AND M. L. DREW. 2006. Brucellosis in elk (*Cervus elaphus*) in eastern Idaho. *Journal of Wildlife Diseases* 42: 271-278.

PHALEN, D. N., M. L. DREW, N. HOBSON, AND D. L. GRAHAM. 2005. Naturally occurring secondary nutritional hyperparathyroidism in cattle egrets (*Bubulis ibis*) from central Texas. *Journal of Wildlife Diseases* 41:401-415.

SACCO, R. E., W. R. WATERS, K. M. RUDOLPH, M. L. DREW. 2004. Comparative nitric oxide production by LPS-stimulated monocyte-derived macrophages from *Ovis canadensis* and *Ovis aries*. *Comparative Immunology, Microbiology and Infectious Disease* 29:1-11.

WEISER, G. C., D. L. MILLER, J. RHYAN, AND M. L. DREW. Antibiotic effects on bighorn bacterial flora. In preparation.

Submitted by:

Mark L. Drew, D. V. M.

Wildlife Veterinarian

Phil Mamer, D. V. M.

Wildlife Veterinarian

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Dale E. Toweill
Wildlife Program Coordinator
Federal Aid Coordinator

James W. Unsworth, Bureau Chief
Bureau of Wildlife

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.

