IDAHO DEPARTMENT OF FISH AND GAME

Ed Schriever, Director

Project F16AF00747

Final Performance Report

WILDLIFE HEALTH LABORATORY

July 1, 2017 to June 30, 2019

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FEDERAL AID IN WILDLIFE RESTORATION
FINAL PERFORMANCE REPORT

State: Idaho

Grant number: F16AF00747 Amendment 2

Grant name: Wildlife Health Laboratory

Report Period: July 1, 2018 to June 30, 2019

Report due date: September 28, 2019

Location of work: Statewide

Approach

1. Assist with the preparation, coordination and implementation of all game animal capture events, including intra and interstate translocations. All handled wildlife, estimated at 200 individuals, will have samples collected for disease surveillance in accordance with Idaho Code and established species-specific sampling protocols and pathogens of concern. Where possible, samples will also be collected for collaborative research projects.

2. Provide veterinary and biological services and assistance to support statewide wildlife, habitat, and State Wildlife Action Plan (SWAP) programs to coordinate and facilitate wildlife health and disease investigations at the IDFG's Wildlife Health Laboratory and throughout Idaho. The Wildlife Health Program will also work with universities, state and federal agencies, and other non-governmental organizations conducting research or population monitoring on Idaho wildlife to solicit and collect samples for population-level health assessment and disease monitoring.

    a. Wildlife Health Program staff will coordinate with biologists or other agency partners to fully investigate reported wildlife morbidity and mortality events. Full necropsies and diagnostic testing will be conducted, with samples collected, processed and submitted for laboratory analysis, as needed. An expected 200-600 morbidity and mortality events will be investigated throughout the year, with approximately 175 necropsies conducted by Wildlife Health Program staff. Wildlife Health Program staff will develop, validate and implement diagnostic testing in-house and in collaboration with interagency partners for the rapid detection and typing of known, high impact wildlife diseases as well as diseases of special concern in Idaho's wildlife populations. Key test development and implementation will be done as identified.

    b. New and emerging pathogens: as they arise, conduct investigations on diseases of concern for Idaho's wildlife, especially as the diseases impact livestock, or are a public health concern. Wildlife Health Program staff will develop, validate and

implement diagnostic testing in-house and in collaboration with interagency partners for the rapid detection and typing of new and novel diseases as well as diseases of special concern in Idaho's wildlife populations. Key test development and implementation will be done as identified.

c. Chronic Wasting Disease (CWD): Greater than 700 mule deer lymph node samples (totals determined by a statistically weighted model based on gender, age, location and symptom status) will be collected in the following population management units (Caribou, Palisades, Island Park, Bannock, South Hills, Owyhee, and Snake River) during the 2018-2019 harvest seasons. Surveillance goals are met using opportunistic sampling from hunter harvest and road-kill animals as well as targeted sampling of symptomatic animals.

d. Brucellosis: 200 or more blood samples will be submitted to the ISDA laboratory from hunters within and around the Brucellosis Designated Surveillance Area (DSA). In addition, serum samples from captured elk will also be submitted for testing. This analysis assists IDFG, ISDA and USDA to define the scope and movement of seropositive Brucellosis elk in and around Idaho's DSA. In 2009, a three-year rotation-based sampling strategy was established for Brucellosis hunter harvest surveillance. The following population management zone are part of the 2018-2018 rotation: Caribou, Palisades, Island Park, Beaverheads, Big Desert, Pioneers and Tex Creek.

e. Bighorn Sheep (BHS): IDFG staff will collect 75+ harvest samples (blood, swabs, fecal, external parasites) from hunters during mandatory harvest checks to assess BHS population health and disease status across the state.

3. Develop training and provide education to agency staff, interagency partners and other partners. Training classes will be offered (in different regions) for staff that need to initially certify and staff who are required re-certify in administration and handling of chemical immobilization agents. Training and published tools will be provided for sample collection, sample handling, shipping, and storage of biological specimens. Classes will review basic field necropsy and the basic principles applied across species and disease investigations.

    a.

4. Wildlife Health Biologists will provide quality control of health-related data and maintain wildlife health data in the Statewide Animal Database, provide training for data entry, data retrieval and quality control, and develop reporting requirements metrics with IT staff for assessing quality data standards and review. The Wildlife Health Database contains hundreds of thousands of health related data points that span the past thirty years. Data sharing and linking animal identifiers between all wildlife-population data streams will enhance data quality, animal tracking and understanding of wildlife populations. This is a year round and ongoing task.

5. Provide genetic and nutritional analyses to support the development of species-specific integrated population models (IPMs) identified by Wildlife management and research staff in conjunction with Wildlife Research and Survey & Inventory grants. In addition, utilize regional wildlife management objectives, species plans, disease plans and Idaho's SWAP to determine the need and scope of analyses. Develop population level genetic databases for game species and species of greatest conservation need, develop mitochondrial speciation testing for identification of unknown specimens, and provide nutritional analysis for 100 plant and animal samples in support of the IPM.

6. Assist and participate in the development, revision and implementation of wildlife and health related rules and policies, disease surveillance plans; species management plans, and other statewide wildlife planning efforts. The following are examples of statewide plans staff have been involved in: CWD rule and policy development and planning, Brucellosis surveillance policy and planning; Species management and disease planning (Moose, White-tailed Deer, Mule Deer, and Upland Game Bird), and IDFG and statewide facility continuity of operations and disaster planning. Planning efforts are ongoing throughout the year.

7. Wildlife Health Program staff will provide technical assistance to cooperating agencies, the public, and institutions on issues related to wildlife health and disease, especially those that impact human or domestic animal health. Technical assistance will also be provided in the form of wildlife import and export approvals and captive facility health approval.

8. Assist Wildlife and Communications Bureaus with the development, review, and dissemination of Wildlife health-related information, including prioritization of health and disease information needs, and development of fact sheets and other public information for the web site, news releases, social media, and print. Provide technical expertise on wildlife health and disease issues to inform agency staff, the commission, key stakeholders, and the public.

9. Respond to calls (est. 1,000+) concerning wildlife health, disease, and public safety via direct line, cell phones, and email. This is a daily and year round task.

10. Wildlife Health Program staff will maintain collections of reference materials including serum, DNA, reference materials, and literature. All DNA and serum samples collected from hunter surveillance and live capture will be barcoded. This is a year round task with a peak seasonality around harvest seasons.

Expected Results

The Wildlife Health Program provides Idaho with first response wildlife health and disease investigatory, surveillance and response capability. Rapid disease detection and identification of pathogens of concern (Brucellosis, CWD, HPAI, Plague, Rabies) or new and emerging pathogens (HPAI, WNV, WNS) is critical to monitoring and understanding the health of our wildlife populations, as well as, any impact wildlife disease can have on domestic livestock and human health.

Wildlife health assessment includes the collection, analysis, and archiving of biological samples obtained from wildlife, fieldwork to investigate wildlife health status and disease events, and diagnosis of disease in animals through field and laboratory necropsies. These services provide biological information (physiological, nutritional, disease status, genetic, toxicological) essential for wildlife management decisions and informing policy. Wildlife Health program staff provide health support during animal immobilization, capture, marking, and translocation ensures the projects health sample and data collection are efficient. The Wildlife Program also assists research and management staff to minimize undesirable outcomes and impacts on wildlife while handling live animals.

Disease research and long term disease monitoring provide highly beneficial information about the impact of disease on wildlife populations, and assist in wildlife conservation and management actions. Statewide assessment of wildlife morbidity and mortality is critical in providing real-time, adaptive management and information for wildlife disease issues.

Efficient data input and storage, along with effective data management, and analysis is critical to allow IDFG's Wildlife Health Program staff and wildlife managers to better utilize the results of biological sampling, disease investigation and other wildlife health related data. Access to comprehensive health data will allow multi-layered analyses for greater incorporation of health and disease metrics into management, research and policy planning. Wildlife health data that is easily queried will allow for comprehensive and long-term analyses, including trend, spatial, temporal, species or pathogen specific studies to enhance protecting and perpetuating Idaho's wildlife resources.

Providing relevant, useful health and disease related information and technical assistance to agency staff, stakeholders, and the public in a timely and understandable manner is a critical part of supporting the Department's mission. Increasing information and assistance to all partners benefits not only our partners but also assist with strengthening local, state, federal, and non-governmental collaborations and programs.

If the work in this grant was part of a larger undertaking with other components and funding, present a brief overview of the larger activity and the role of this project.

N/A

Describe how the objectives were met.

Objective 1: Collect, submit, process, analyze, and report on 2,000 biological samples to determine health and/or disease status by 30 June 2019. Includes CWD, Brucellosis, Hunter health checks, Targeted and opportunistic surveillance.

Between July 1, 2018 and June 30, 2019, the Wildlife Health Lab staff received, accessioned, processed, input and analyzed 3,343 total biological cases. These cases were related to disease surveillance, cause of death assessments, live animal health checks, and population genetics analyses. (Table 1.) Carcasses, tissues, or biological samples from 356 animals were submitted for necropsy or lab analyses to determine cause of death and collect biological data in support of wildlife management and research assessments. Seven hundred and thirty three samples were collected for CWD surveillance from six mule deer population management units (PMUs) and from targeted surveillance across the state (see Table 2). CWD was not detected in the samples submitted. Brucellosis surveillance efforts focused on hunter-harvested elk and active disease surveillance and captured animals. Twenty five hundred sample kits were sent out to hunters and 321 (12.8%) samples were returned. An additional 55 samples were submitted for active disease surveillance from elk captured for management purposes. Four management elk tested as reactors on brucellosis serology tests. Of the 321 hunter surveillance elk, 314 were negative, five were suspect or reactors, and two samples were determined to be unsuitable for testing because of improper tissue types, inappropriate sample amounts and poor sample collection. Biological sample data was entered and archived in a wildlife health database, which in 2019 was modified to align and connect health data with IDFG's statewide animal database and the IDFG big game mortality reporting (BGMR) database for better statewide functionality. Fifteen hundred and six samples were submitted for DNA analyses for multiple population genetics projects including, gender typing of harvested mountain lions to determine accuracy of gender identification on harvest reports.

Table 1. Biological samples processed.

FY2017 – FY 2019 BIOLOGICAL CASES				
	FY2017	**FY2018**	**FY2019**	**Total**
Total biological cases	**3270**	**2279**	**3343**	**5549**
CWD Harvest Surveillance	1066	588	708	2362
CWD Targeted Surveillance*	18	56	29	103
Brucellosis Harvest Surveillance (Elk)	257	252	321	830
Brucellosis Management Surveillance*	388	120	55	563
Live Animal Surveillance	583	676	368	1627
DNA Samples	1048	468	1506	3022
Necropsy/Tissue samples	316	295	356	967

Table 2. July 1, 2018 - June 30, 2019 CWD surveillance results.

Hunter Surveillance :	# of Samples	Points	Detection Ability with 95% Confidence
Mule Deer			
Zone 1			
Caribou	159	190.38	
Island Park	106	101.92	
Palisades	29	40.18	
	294	**332.48**	**1.0% prevalence**
Zone 2			
South Hills	25	32.48	
Bannock	194	297.29	
	219	**329.77**	**1.0% prevalence**
Zone3			
Owyhee	168	79.87	
Snake River	14	32.25	
	182	**112.12**	
Other			
Zones outside of rotation	**13**	**0**	**na**
Total	**708**		
Suspect Animals			
Mule Deer	**1**	**na**	
Elk	**18**	**na**	
Moose	**2**	**na**	
White-tailed Deer	**8**	**na**	
Total	**29**		
All CWD Samples Collected	**733**		

Objective 2: Conduct 175 necropsies to determine health status, disease status, and determine cause-of-death by 30 June 2019.

Between July 1, 2018 and June 30, 2019, the Wildlife Health Lab staff conducted a total 356 necropsies, cause of death assessments, or received samples from dead or harvested animals for archiving. One hundred and thirty three full necropsies were performed on more than 35 species during this period. Between 3 and 10 biological samples were collected per necropsy cases for disease diagnostics and cause of death analyses. One hundred and thirty four field necropsy tissues or other samples were submitted to the lab for assessment and diagnostic testing. In addition, 56 bighorn sheep and 33 mountain goat hunters submitted numerous

samples for health assessment and disease testing and these numbers were included in the total necropsy cases. Bighorn sheep and mountain goat hunter-harvest surveillance efforts are assisting biologists and managers in identifying areas of disease prevalence in bighorn sheep and mountain goat populations across Idaho. Fifty-one birds were submitted to the lab from under power lines to assess animals for electrocution, gunshot, and other causes of death. This is an ongoing project with regional staff, USFWS, and USGS to better quantify the cause of avian deaths. In addition, necropsy submission of a malformed hoof resulted in the first positive case of Treponema-Associated Hoof disease detected in Idaho. As a result, additional cases were detected and hunter surveillance efforts are being planned for the fall and winter of 2019.

Objective 3: Train 150 Department staff in proper animal restraint, chemical immobilization, field necropsy, sample collection and packaging and shipping procedures by 30 June 2019.

Fifty-eight biologists and enforcement officers attended training in Wildlife Chemical Restraint during the FY2019 grant period. IDFG Wildlife Chemical Restraint training is a two-day course taught by Dr. Mark Drew. It provides mandatory training and re-training wildlife and enforcement staff that utilize chemical immobilization drugs as part of their routine job duties. IDFG staff are provided current and up to date training on a bi-annual basis per policy.

Wildlife Health Lab staff also provided training for 128 biologists, wildlife law enforcement officers, and communications staff at 4 biological sample collection workshops during the grant period. This training focused on wildlife behavior, as well as best practices in wildlife restraint, biological sampling, and communication. The Wildlife Health Lab also provided wildlife education and career seminars to over 1200 youth (ages 10-18), parents, and educators at the Wild Sheep Foundation sponsored Youth Conservation Education Expo in Reno, Nevada in January of 2018.

Table 3. Training provided by Wildlife Health Lab in FY2019.

Name of session	Type	Number Held	Estimated Attendance	People Attending
Wildlife Chemical Restraint Classes	Training	4	58	Biologists, Law Enforcement
Biological Sample Collection Training	Training	4	128	Biologists, Law Enforcement
Youth Conservation Education Expo; sponsored by the Wild Sheep Foundation	Training	2	1200	Youth, Parents, Educators and General Public

Discuss differences between work anticipated in grant proposal and grant agreement and that actually carried out with Federal Aid grant funds.

N/A

List any publications or in-house reports resulting from this work.
Reports, Presentations, and Posters
2018 – Drew, Mark L, J. Struthers, J. Husseman. Elevated body temperature associated with Ketamine mixtures during capture of wolves, Canis lupus, in Idaho, 1997-2018. Wildlife Disease Association Annual Conference, St. Augustine, Florida.

2019 – Drew, Mark L. Brucellosis in elk in Idaho, 1999-2019. Wildlife Disease Association Annual Conference, Tahoe, California.

Publications
Gillin, C. M., and Mawdsley, J. R. (eds.). 2018. AFWA Technical Report on Best Management Practices for Prevention, Surveillance, and Management of Chronic Wasting Disease, Association of Fish and Wildlife Agencies, Washington, D. C., 111 pp.

Horne, J.S., Ausband, D.E., Hurley, M.A., Struthers, J., Berg, J.E., and Groth, K. 2018. Integrated population model to improve knowledge and management of Idaho wolves. JWM 21554

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IDAHO DEPARTMENT OF FISH AND GAME

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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.