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Governor

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DEPARTMENT OF WILDLIFE
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February 9, 2017

Rick Combs, Director
Legislative Counsel Bureau
401 S. Carson Street
Carson City, NV 89701-4747

Dear Director Combs:

I am pleased to provide you with an electronic copy of the Restricted Reserve Accounts Budget and Program Summary for Fiscal Years 2015-2016. The attached status report is submitted to the Nevada State Legislature as required per NRS 502.298. The report includes additional information regarding the following programs:

- Duck Stamp
- Operation Game Thief
- Elk Damage Mitigation Fee
- Habitat Conservation Fee
- Upland Game Bird Stamp
- Mining Assessment Fee

The report summarizes the projects undertaken and a financial summary for each program. Please let me know if you have any questions regarding this report.

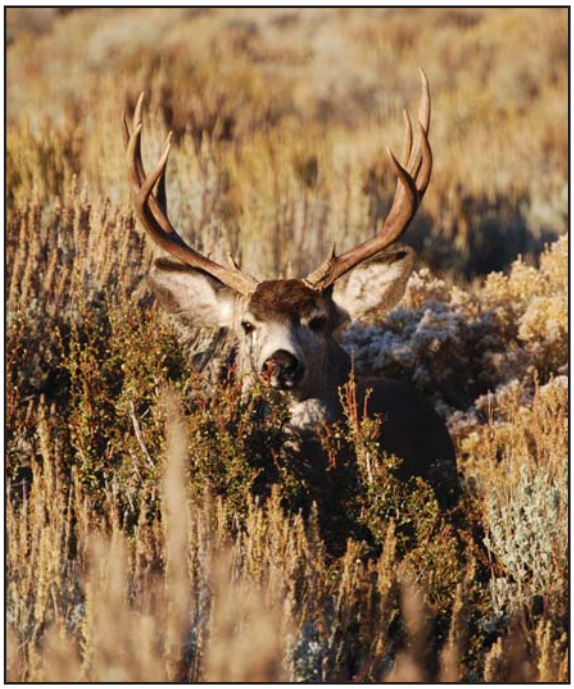
Sincerely,

Liz O'Brien
Deputy Director

Nevada Department of Wildlife

Restricted Reserve Account

Budget and Program Summary



Fiscal Years 2015 & 2016

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Restricted Reserve Account
Budget and Program Summary

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STATUS REPORT OF NEVADA DEPARTMENT OF WILDLIFE'S DUCK STAMP PROGRAM REVENUE, PROGRAM EXPENDITURES AND PROJECTS UNDERTAKEN DURING FISCAL YEARS 2015 AND 2016

Highlights of Duck Stamp Projects Funded in FY15

Overton WMA Farming

Approximately 50 acres were seeded in the spring with barley, cereal rye, alfalfa and wheat. Ammonium sulfate fertilizer was also purchased to increase productivity of the fields. This project was completed by the Cooperator under the terms of the current farming and agricultural lease agreement. Approximately $3,500 was spent on seed and fertilizer.

Overton WMA Water Pipe Project

Around $40,000 was spent on water supply pipe and valves extending from the C-4 field to Wilson Pond. Approximately 1,200 feet of 18-inch diameter PVC pipe, thirty-five 12 inch irrigation valves, and necessary fittings were purchased to replace deteriorated concrete ditches. These improvements will allow better management of our water delivery system and will conserve valuable water resources. The pipe line was installed by Nevada Department of Wildlife (NDOW) staff at the Overton Widlife Management Area (WMA) in July and August of 2015.

Overton WMA Water Outlet Replacement

Approximately $4,000 was spent on pipe materials and water control structures. This work will improve our ability to effectively control water levels, and improve habitat conditions in moist-soil units for both game and non-game bird species. Installation of the water control structures and pipe was done by NDOW staff on 8 moist-soil units.

Overton WMA

Overton WMA Pond Improvements

Ducks Unlimited was contracted to conduct survey work and prepare a topographic base map that will be used in the future leveling of Pintail and Wilson Ponds. The design will be a cut and fill balance that will result in more uniform pond bottoms that eliminate overly deep areas and will spread water to areas that in the present state do not support shallow pond conditions. The design will also improve water delivery efficiencies and drainage, thus enhancing NDOW's ability to manage habitat, including an increase in the production of preferred waterfowl food plants. A total of $13,613 was expended on this project for the survey and project design.

Key Pittman WMA Wetland Enhancement

NDOW hired Ducks Unlimited to perform survey and design work associated with a wetlands improvement project at the north ponds on the Key Pittman WMA. This project funded Phase I of a wetland enhancement plan intended to provide better habitat conditions for waterfowl, better hunting opportunities for area users and will alleviate the situation under which the neighbor's pasture gets flooded. A total of $16,985 was expended on this project for the survey and project design.

Key Pittman WMA Wildlife Food Plots

Approximately 60 acres were planted in October with wheat, oats, cereal rye, barley, and hairy vetch as a winter cover crop. An additional 40 acres were planted in November with ryegrass, tall fescue, sand dropseed, and Sandberg bluegrass to enhance desirable vegetation in areas where the removal of noxious weeds and fuel break construction left areas that were lightly vegetated or were bare ground. During February, 60 acres were seeded with spring wheat, oats, barley, alsike clover, native annual sunflower, small burnett, and rocky mountain bee plant. Selected areas along the shoreline of the upper ponds were hand-seeded in June, 2015 with millet and native sunflower to increase forage production in feeding areas on the WMA and to enhance hunting opportunities. This project was completed by WMA personnel and a total of $6,066 was spent on seed.

Fallon Wood Duck Project

During FY15, $21,000 was spent on the Wood Duck Project. These funds supported a technician from February 1 through June 30, 2015. A total of 74 wood duck nests were found and monitored in 2015. A total of 555 Wood Ducks were banded, 473 were recaptured, and an additional 974 marked individuals were re-sighted. Wood Duck harvest in the Fallon area has been closely monitored to evaluate mortality rates under varied hunting intensity versus natural rates of mortality.

Wood Duck

A large component of this project has been to determine the effects of various rates of harvest on a duck population. The 2014/15 hunting season marked the final of the four experimental harvest years for the harvest experiment. A PhD student collected data for this harvest experiment and will use the data to defend his PhD at the University of Nevada, Reno.

Geolocators for Waterfowl

A total of $21,513 was spent on the geolocator/waterfowl tracking project during FY15. All of these funds were used for the purchase of geolocators. Geolocators are a cheap alternative for following movements of individual ducks by recording daily light curves. In concert with a clock, geolocators can be used like a sailor's sextant by using midday and midnight times, along with daylight length to calculate longitude and latitude. The stored data has to be physically downloaded. A total of 150 geolocators were purchased in FY15: 50 for mallards, 50 for canvasbacks, and 50 for wood ducks. The primary use of these geolocators is to monitor what proportion of the annual cycle these three species spend in Nevada for purposes of providing habitat managers with additional information. A secondary benefit of geolocators is they take advantage of the tendency of wood ducks to nest in dark cavities, either a natural cavity in a tree or human installed nesting boxes, which allows the geolocator to record breeding activity.

North American Waterfowl Management Plan Implementation Support

A total of $10,000 was donated to Ducks Unlimited to help them implement the migratory bird projects that were developed as a result of the North American Waterfowl Management Plan. The projects primarily consist of wetland restoration, forage establishment and production, and the purchase of conservation easements in the prairie potholes regions of Saskatchewan and Alberta. Band return data show these two Canadian provinces serve as the sources for a significant number of waterfowl that pass through Nevada each year.

Mason Valley WMA Cattail Control

Dense stands of cattail and bulrush within the Bass Pond and Crappie Pond units were treated with aquatic-approved herbicides in the fall. Chemical treatments in areas were followed by prescribed burns in the spring. The removal of the dense stands of emergent vegetation increased the acres of open water that can be utilized by waterfowl.

Mason Valley WMA Joggles Pump Station

The Joggles Well pumped approximately 322 acre-feet of ground water from July to December of 2015. The Joggles Well was used to irrigate an 80 acre millet plot unit as well as the moist-soil areas on the eastern portion of the Mason Valley WMA. $4,511 of Duck Stamp funds were used to help pay the power bills for this pump station.

Mason Valley WMA Redhead Pump Station

The Redhead Pumping Station was used during FY15 to supplement irrigation waters from the Walker River. The waters from the Redhead Pump irrigated moist-soil areas in the Goldeneye, Ruddy and Millet Plot units. Ponds were created using the Redhead Pump in the fall that provided roosting and feeding sites for migrating waterfowl. Duck Stamp funds in the amount of $454 were used to help pay the power bills for this pump station.

Carson Lake and Pasture Prescribed Burn

Funding in the amount of $1,000 was used for NDF Conservation Crews to assist with a prescribed fire in the Rice Unit within the Carson Lake and Pasture area. This allowed WMA staff to improve approximately 1,100 acres of habitat for waterfowl.

Prescribed burn area

Carson Lake and Pasture Vegetation Management

A total of $4,000 was spent on herbicide and its aerial application by a private contractor during the fall of 2014 at Carson Lake and Pasture. Approximately 250-300 acres of cattail and hardstem bulrush were treated at various ponds and drains on the property to improve waterfowl habitat and hunter access.

Eastern Region WMA Weed Control

A total of $5,749 was spent on herbicide treatments at the Bruneau River, Steptoe Valley, Wayne E. Kirch, Key Pittman and Franklin Lake WMAs. Canada thistle, Scotch thistle, hoary cress, perennial pepperweed, Russian knapweed and leafy spurge were treated on state-owned lands to clean up important waterfowl habitat. This effort will reduce further weed encroachment at the sites and diminish transportation of noxious weed seeds to other areas. In addition, some funds were utilized to purchase herbicides for South Fork State Park near Elko. NDOW has participated in weed abatement work in this area for the last several years.

Highlights of Duck Stamp Projects Funded in FY16

Overton WMA Irrigation System Repair

As part of this project, Duck Stamp funds were used to purchase parts and supplies to repair broken sections of the irrigation pipes that are on the Overton WMA. There were repairs made to 3 different areas of the irrigation system where pipe had failed due to poor installation. Other areas where repairs are needed are being identified and will be repaired as soon as conditions and time permits. This project will result in more efficient flow of water to the moist-soil units that waterfowl and other shore birds utilize on the WMA.

Overton WMA Farming

Approximately 130 acres of the agriculture fields at Overton WMA were sprayed with Thunder, Clethodim and Round-Up to control Russian knapweed, johnsongrass, field sandburs, malta starthistle and foxtail. This treatment improved crop production and the quality of wildlife habitat by removing undesired vegetation in the agricultural fields that are utilized by waterfowl. This project was completed by the Overton WMA Cooperator under the terms of the current farming and agricultural lease agreement. A total of $3,499 was spent on herbicides.

Overton WMA Water Outlet and Pipe Replacement

Pipe and flashboard risers were purchased and installed on 4 moist soil units in July and August 2016 by Overton WMA staff. The remaining structures and pipe will be installed in early summer of 2017. The replacement of the current outlet structures will allow staff to effectively control water levels to improve habitat conditions in the moist soil units which benefit waterfowl and marsh birds.

Overton WMA Weed Control

A total of $3,007 was spent on herbicides and their application at the Overton WMA. 40 gallons of Rodeo, 15 gallons of Garlon 3A, 5 gallons of Garlon 4, 5 gallons of Pendulum, and 2 gallons of spray indicator were purchased with the funding. Cattail, malta starthistle, puncturevine, field sandburs, cocklebur and arrowweed were treated to clean up important waterfowl habitat. This effort will aid in future weed encroachment at the treated sites and help prevent the spread of weeds to other areas.

Geolocators for Waterfowl

During FY16, $23,132 was used to purchase geolocators. The Nevada Waterfowl Association also provided $35,400 of funds for the project. As noted above, geolocators are a cheap alternative for following the movements of individual ducks. 150 geolocators were purchased with 70 geolocators being fitted to wood ducks, 50 fitted to Mallards and 30 fitted to Canvasback ducks. The results from this study thus far were presented at the North American Duck Symposium and were well-received, with much interest from many different researchers across North America.

Canvasbacks fitted with the nasal saddle type of geolocator (leg band geolocators are also used)

Fallon Wood Duck Project

In 2016, 60 Wood Duck nests were found and monitored. A total of 313 wood ducks were banded, 261 were recaptured, and 550 were re-sighted from July 1, 2015 to May 1, 2016. Researchers attended the 7th North American Duck Conference in Annapolis, MD in February 2016 and presented multiple presentations about the project.

Preliminary analyses have been conducted and presented by PhD candidate Ben Sedinger. Ben has examined how hunting mortality has influenced the annual survival rate of wood ducks and is finding very strong evidence of compensatory mortality (in other words, hunting is not playing a large role in mortalities relative to other causes of mortality). Ben is using new Bayesian approaches (a type of statistical modeling that uses new analytical techniques) which examines this relationship resulting from banding, recapture, and hunter reports of shot birds. Ben has also been using Pradel models to examine recruitment and has some preliminary results that recruitment and survival rates are extremely negatively correlated suggesting very strong density dependence in this system (he is finding that relative to habitat-related limiting factors, hunting is playing a minor role in overall population numbers).

North American Waterfowl Management Plan Implementation Support

Duck stamp funds in the amount of $10,000 were donated to Ducks Unlimited during FY16 for the same purpose as described for this project in the FY15 section.

Carson Lake and Pasture Vegetation Management

Nevada Department of Forestry and NDOW staff burned the Sprig Unit of the Carson Lake and Pasture wetlands. The prescribed burn removed 3,200 aces of overgrown stands of hard stem bulrush and cattails. NDOW staff also began applying

herbicide to perennial pepperweed in April and will continue until 130 acres of perennial pepperweed are treated.

Kirch WMA Food Plots

The purpose of this project was to enhance habitat for upland game birds, mule deer and waterfowl. Forty acres of the lower dove field was planted with Siberian wheat in September. In May, 40 acres of the upper dove field was planted with a mixture of cereal grains and native sunflowers. Forty acres of the Old Place Unit was planted in June, 2016. The moist-soil units within the Old Place Unit were planted with a summer seed mix composed of millets and cereal grains.

Key Pittman WMA Wildlife Food Plots

The work associated with this project during FY16 was the same as described in this project's summary in the FY15 section.

Eastern Region WMA Weed Control

This project's funds were used on herbicide treatments at the Bruneau River WMA. Canada thistle, Scotch thistle, hoary cress and perennial pepperweed were treated on state-owned lands to help restore important wetland habitat. The Stowell property which was acquired in 2012 has been the target of weed control efforts in FY16. It is hoped that the current effort will reduce further weed encroachment on the Bruneau River WMA and diminish the transportation of noxious weed seeds to other areas.

Mason Valley WMA Vegetation Management

The Mason Valley WMA crew treated approximately 160 acres of hoary cress in the Goldeneye, Ringneck, Scaup, and Sciarani Pond units. A prescribed burn was conducted by the Nevada Division of Forestry crews in the spring. A total of 240 acres were burned in the Ringneck, Goldeneye, Bufflehead, and Scaup ponds.

Mason Valley WMA Joggles Pump Station

The Joggles Well pumped 316 acre-feet of ground water from August to December of 2016. This well was used to irrigate 80 acres of food plots and moist soil units on the eastern portion of the Mason Valley WMA. The timing of the irrigation improved waterfowl and shore birds habitat during the migration months as well as benefitting waterfowl hunting and viewing opportunities for WMA users. Duck Stamp funds in the amount of $240 were used to help pay the power bills for this pump station.

Mason Valley WMA Redhead Pump Station

The Redhead Pumping Station was used during FY16 to supplement irrigation water from the Walker River. The water from the Redhead Pump was used to irrigate over 80 acres of moist-soil plants. The water also was used to maintain over 100 acres of waterfowl habitat and hunting areas located on the eastern portion of the WMA. $5,693 of Duck Stamp funds were used to help pay the power bills for this pump station.

Duck Stamp Projects Funded in FY15

Name of Project	$ Spent in FY15
Overton WMA Farming	$3,499
Overton WMA Water Pipe Project	$39,946
Overton WMA Water Outlet Replacement	$3,879
Overton WMA Pond Improvements	$13,613
Key Pittman WMA Wetland Enhancement	$16,985
Key Pittman WMA Wildlife Food Plots	$6,066
Fallon Wood Duck Project	$21,000
Geolocators for Waterfowl	$21,513
North American Waterfowl Management Plan Implementation	$10,000
Mason Valley WMA Cattail Control	$3,993
Mason Valley WMA Joggles Pump Station	$4,511
Mason Valley WMA Redhead Pump Station	$454
Carson Lake and Pasture Prescribed Burn	$1,000
Carson Lake and Pasture Vegetation Management	$4,000
Eastern Region WMA Weed Control	$5,749
Total	**$156,208**

Duck Stamp Projects Funded in FY16

Name of Project	$ Spent in FY16
Overton WMA Water Irrigation System Repair	$11,297
Overton WMA Farming	$3,499
Overton WMA Water Outlet and Pipe Replacement	$2,784
Overton WMA Weed Control	$3,007
Geolocators for Waterfowl	$23,132
Fallon Wood Duck Project	$25,472
North American Waterfowl Management Plan Implementation	$10,000
Carson Lake and Pasture Vegetation Management	$3,843
Kirch WMA Food Plots	$1,800
Key Pittman WMA Food Plots	$2,716
Eastern Region WMA Weed Control	$3,750
Mason Valley WMA Vegetation Management	$4,425
Mason Valley WMA Joggles Pump Station	$240
Mason Valley WMA Redhead Pump Station	$5,693
Total	**$101,658**

Duck Stamp Program Financial Summary FY15-FY16	
Balance Forward to FY15	**$482,147.17**
FY15 Revenue	**$92,385.30**
FY15 Expenditures*	**$(163,413.98)**
Balance Forward to FY16	**$411,118.49**
FY16 Revenue	**$83,504.52**
FY16 Expenditures*	**$(101,659.46)**
Balance Forward to FY17	**$392,963.55**

***includes direct project costs, staff time, and indirect costs

STATUS REPORT OF NEVADA OPERATION GAME THIEF PROGRAM REVENUE, PROGRAM EXPENDITURES AND PROJECTS UNDERTAKEN DURING FISCAL YEARS 2015 AND 2016

Overview:

The Operation Game Thief (OGT) Program was established during the 1981 legislative session. The program is similar to a Secret Witness program and is designed to allow individuals to call and report wildlife crimes while maintaining the ability to remain anonymous and collect rewards for the information.

Since OGT's inception, there has been tremendous public support for the program. From the onset, it was believed that a majority of the program could be supported through public donations. Equally important was the notion that wildlife criminals should shoulder some of the financial burden of investigating and prosecuting the crimes they commit. This was to be accomplished by the courts assessing civil penalties on convicted poachers to ensure that NDOW kept its promise to the courts and the thousands of individuals that make cash donations to OGT. To accomplish this, an obligated account was established to track donated monies and court ordered monies destined for this specific use.

OGT is primarily a self-funded program within NDOW. It continues to provide resources to game wardens in the field to investigate and successfully prosecute wildlife crimes. This is accomplished through a variety of mechanisms such as active promotion of the program through participation in community events, providing training to officers, providing specialized equipment as technology improves, and the interaction and participation in state coordination and planning for law enforcement activities.

The activities and accomplishments of the OGT Program during state fiscal years 2015 (FY15) and FY16 are summarized below.

Captain Paul Dankowski who was in charge of the program retired in July of 2015. The position was not filled until March of 2016 by Captain Brian Eller. As a result, there was a period of little activity in the program.

Highlights of Operation Game Thief Projects Funded in FY15

- Maintained the 1-800 OGT tip line.
- Provided continued cell phone coverage to field officers.
- Purchased patrol equipment such as digital cameras, metal detectors, necropsy equipment, evidence kits, GPS units, and other equipment.
- One ATV was purchased for one of our field positions.
- Provided advanced training such as investigative and undercover training.
- Participated in patrol activities to enhance regional coverage including uniformed patrols in each region for big game and chukar, as well as unmarked patrols.
- Promotion & marketing of the OGT Program.
- Enhancement of the OGT public education trailer.
- Radio promotion of the OGT program through targeted advertising in rural Nevada.
- Participation in conservation group fundraising banquets such as Safari Club International, the Wild Sheep Foundation, and the Carson Valley Chukar Club.
- Participation in conservation & sporting goods conventions and events such as the National Rocky Mountain Elk Foundation "Elk Camp" and retail store promotions such as Cabela's and Sportsman's Warehouse.
- Purchased promotional items for distribution at events and patrols such as license holders, key lights, pens and pencils.
- Participated in national organizations such as the International Association of Natural Resource Crime Stoppers.
- Travel associated with these activities.

- Promotion of Operation Game Thief/Law Enforcement Program - Other Agencies/Organizations.
- Membership in Rocky Mountain Information Network (RMIN) - a regional law enforcement information network.

Highlights of Operation Game Thief Projects Funded in FY16

- Enhancing our field officers' ability to respond to OGT calls and meet public expectations.
- Development and implementation of an online "report wildlife crime" form at www.NDOW.org to augment the avenues for citizens to report wildlife crime violations.
- Maintained the 1-800 OGT tip line.
- Provided continued cell phone coverage to field officers and satellite phone service.
- Provided advanced training for field officers including areas of forensics, criminal investigations and procedures.
- Specialized patrol activities such as plain clothes patrol and uniformed patrol for big game.
- Promotion & marketing of the OGT Program.
- Started a promotional raffle with the OGT Citizens Board to raise money for the Board.
- Participation in conservation and sporting goods conventions or events such as the Northern Nevada Chapter of Safari Club International, Wild Sheep Foundation, and retail events at Cabela's and Sportsman's Warehouse.
- Spent 43 days at 26 different events with the OGT public education "Wall of Shame" trailers.

- Had 2 unit watches for a total of eight days with the OGT trailer. (Pershing and Elko Counties) The trailer was taken to remote locations at prominent road access points to promote the program and answer hunter questions.
- Purchased lanyards, license holders and flashlights to distribute to sportsmen. These items contained OGT logo and phone number, so that hunters in the field will have the information they need to report wildlife crime as it happens.
- Promotion of OGT/Law Enforcement Program and Other Agencies or Organizations.
- Participation in RMIN.
- Participation in regional law enforcement events, meetings and planning such as National Night Out, monthly regional law enforcement meetings, special Olympics in Reno and "Cops and Burgers" event in Reno.
- Participated in career days at two schools and outdoor educational trips to two other schools.
- Helped develop and implement the Nevada Game Warden website nevadagamewarden.org.
- Received donation of a Jumping Jack tent trailer donated to NDOW for use by the field wardens.
- Maintained membership in IWC (International Wildlife Crimestoppers). Attended the 2016 Conference in Texas and NDOW will be hosting the 2019 Conference.

These are some of the items and activities that OGT has funded or actively participated in. OGT still has at its core, the basic mission of protecting Nevada's wildlife resources and supporting those efforts that will successfully lead to the apprehension and prosecution of violators and promote the program to encourage and obtain greater public participation in the protection of a valuable resource that belongs to all citizens of Nevada.

With continued public support for this mission demonstrated by continued and voluntary financial support from the public, the support of the OGT Citizens Board providing rewards, the public support of district attorneys prosecuting wildlife cases, and the judicial application of our civil penalty statutes, OGT will continue to play a critical role in protecting the resources of the state.

Operation Game Thief Program Financial Summary FY15 and FY16

Operation Game Thief Financial Summary FY15-FY16	
Balance Forward to FY15	**$77,026.80**
FY15 Revenue	**$105,278.74**
FY15 Expenditures*	**$(47,008.11)**
Balance Forward to FY16	**$135,297.43**
FY16 Revenue	**$45,175.51**
FY16 Expenditures*	**$(59,291.89)**
Balance Forward to FY17	**$121,181.05**

*** includes direct project costs, staff time, and indirect costs**

NEVADA DEPARTMENT OF WILDLIFE'S ELK DAMAGE MITIGATION PROGRAM REVENUE, PROGRAM EXPENDITURES AND PROJECTS UNDERTAKEN DURING FISCAL YEARS 2015 AND 2016

BACKGROUND

This report is submitted to the 79th Session of the Nevada State Legislature pursuant to NRS 504.175. During the 65th Session, a bill was enacted that mandates that NDOW maintain a fund for the prevention and mitigation of damage caused by elk (NRS 504.155, 504.165). The Nevada Board of Wildlife Commissioners (Commission) further adopted NAC 504.350 through 504.440 to enable NDOW to administer an Elk Damage Mitigation Program. The Commission further amended NAC 502.331 to charge an additional $5 application fee to all elk tag applicants to be used exclusively for the mitigation of elk damage.

PROGRAM SUMMARY

The beginning balance in state fiscal year 2015 (FY15) was $499,374.45, the lowest beginning balance in 3 years. While revenues into this account have been growing, expenditures in FY14 exceeded revenues for the first time. Yet in FY15 and 16, expenditures were reduced dramatically. Elk distribution and numbers are no longer increasing dramatically, and many persistent challenges have been addressed in recent years. FY15 and 16 revenues were relatively similar, as were expenditures. The majority of these revenues have been used to provide proactive mitigation measures, including fencing of fields and haystacks, whereas a minority of projects funded includes payment for direct elk damage. Although individual damage claims comprise about 9% of the total cost, the amount is variable over the years. Material costs for building fences and preventing access to haystacks are similarly variable, and compose about 50–90% of the total costs each year. Labor costs for erecting the fences and structures comprise the remainder of the costs. Due to the steady revenue and reduced expenditures, the elk damage mitigation program is currently well-funded and adequate to cover anticipated expenses that may develop in the near future.

Elk Damage Mitigation Fees Financial Summary FY15-FY16	
Balance Forward to FY15	**$499,374.45**
FY15 Revenue	**$276,815.60**
FY15 Expenditures*	**$(83,336.33)**
Balance Forward to FY16	**$692,853.72**
FY16 Revenue	**$209,347.54**
FY16 Expenditures*	**$(87,126.84)**
Balance Forward to FY17	**$815,074.42**

* includes direct project costs, staff time, and indirect costs

STATUS REPORT OF NEVADA DEPARTMENT OF WILDLIFE'S HABITAT CONSERVATION FEE PROGRAM REVENUE, PROGRAM EXPENDITURES AND PROJECTS UNDERTAKEN DURING FISCAL YEARS 2015 AND 2016

Highlights of Habitat Conservation Fee Projects Funded in FY15

Humboldt River Watershed Restoration Project

The managers of the Humboldt River Watershed Restoration Project used their awarded Habitat Conservation Fee (HCF) FY15 funds to help control weed infestations in the Humboldt River basin. Five projects were supported by HCF funds. These funds were used by the Humboldt Watershed Cooperative Weed Management Area (HWCWMA) group to support weed spraying and revegetation efforts. The HCF funds were matched 50/50 with other sources to double the size of the funding available to the HWCWMA to conduct restoration activities. A NDOW representative serves as a board member on the HWCWMA Board of Directors.

Diversity Division Summer Conservation Aid

The HCF account was used to fund a FY14-FY15 summer conservation aid for NDOW's Wildlife Diversity Division. The overall purpose of the position was to increase the coverage, efficiency, and amount of surveys and data collected for the Division that would, in turn, contribute to our understanding of species distributions, population status, and conservation needs. The position also provided an opportunity to mentor a student in the wildlife discipline. The Conservation Aid II was a Great Basin Community College undergraduate who worked for 10 weeks and was based out of Elko. The aid assisted area biologists with field surveys for various wildlife including small mammals, northern goshawks, burrowing owls, breeding birds, American pikas, Columbia spotted frogs, and bats. She also helped respond to numerous injured wildlife calls. The aid also focused on populating and quality checking the NDOW winter raptor database, which made a valuable long-term dataset ready for data analysis.

Toiyabe Sage Grouse PMU Wildlife Habitat Enhancement

This multi-year project was authorized by several decisions rendered by Battle Mountain BLM. These decisions were put in place in an effort to facilitate the removal of pinyon and juniper trees within in key Greater Sage-grouse habitat in the Battle Mountain District/Mount Lewis Field Office. Monies provided through the HCF and Upland Game Stamp Program in FY15 were specifically used to make use of Bootstraps Crews (disadvantaged youth) from the Duck Valley Reservation to aid in the tree removal within targeted sage grouse habitats. Lander County Cooperative Extension in conjunction with the University of Nevada, Reno developed this strategy for habitat enhancement on public lands while at the same time introducing youth to the many aspects of public land resource management. The program has been extremely successful in both goals – enhance sage grouse habitats and introduce young people to resource management. In FY15, Bootstraps Crews focused on work within the Toiyabe PMU on the east and west sides of Mt. Callaghan in Lander County.

Additional funds were also provided by ORMAT to mitigate impacts from the development of the McGuinness Hills Geothermal Plant.

Bootstrap crews at work in Greater Sage-grouse habitat north of Austin, NV

GIS and Related Wildlife Monitoring Support

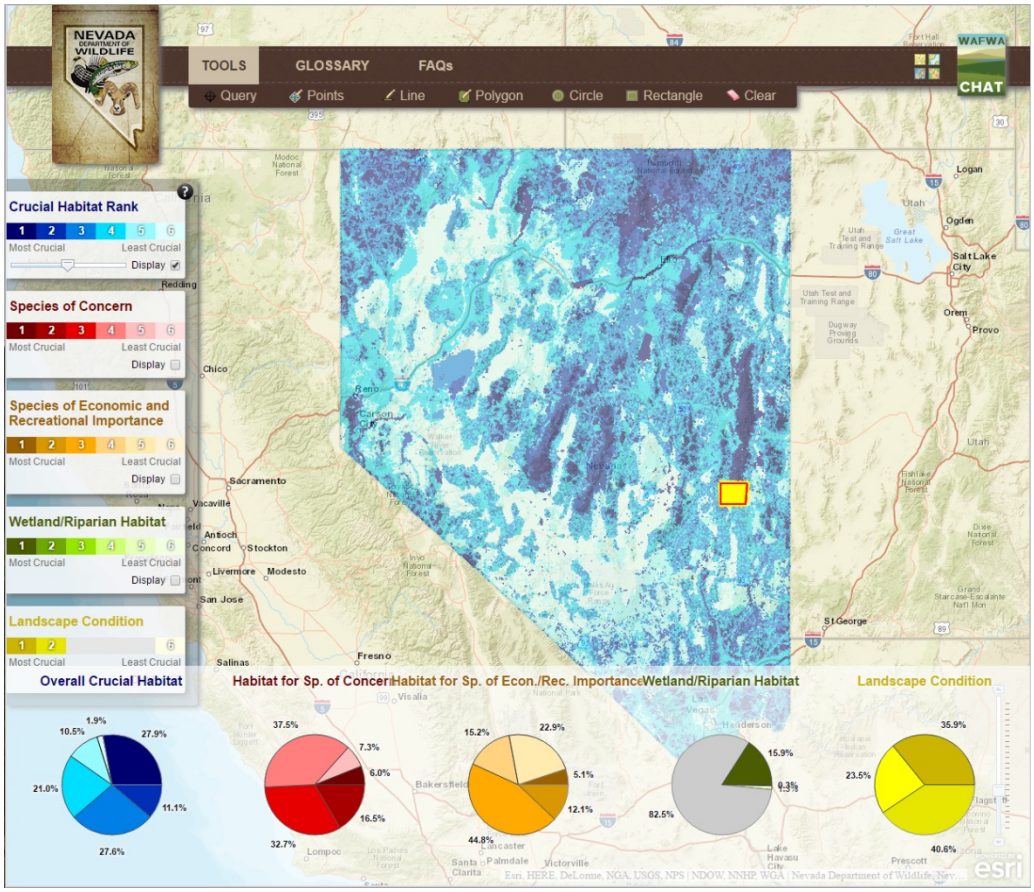
The capacity to analyze information in a spatial context is essential to effective resource management and planning for the modern wildlife agency. NDOW's Geographic Information System (GIS) provides tools and technology for collecting, organizing, analyzing, and presenting wildlife species and habitat data throughout the state. Having this information in a centrally located and accessible data system allows managers to quickly and effectively recognize trends in population dynamics, identify migratory corridors, and characterize and document the location of crucial habitats, thus improving the efficiency and effectiveness of management strategies.

During FY15, the NDOW GIS program used HCF funding to continue several improvements to the spatial data management system used to help inform land use development decisions and habitat restoration priorities. Specific improvements include:

- the ongoing development and maintenance of the Nevada Crucial Habitat Assessment Tool (NVCHAT),
- ongoing data entry from field survey and scientific collection efforts,
- ongoing improvements to existing wildlife resource databases, and
- the production of maps and reports of comprehensive wildlife resource information provided by these databases.

The improvement in NDOW management efforts resulting from this project have benefited such species as the Greater Sage-grouse, mule deer, bighorn sheep, various

bat species, golden eagles, and other species contributing to Nevada's rich biodiversity.



Nevada Crucial Habitat Assessment Tool (gis.ndow.nv.gov/nvchat).

Lake Mead Aquatic Habitat Development

As an aging reservoir, Lake Mead lacks aquatic vegetation and habitat structure. Furthermore, long-term drought conditions have caused annual lake elevation declines that do not allow for inundation of shoreline vegetation. The development and installation of habitat structures in Lake Mead will provide habitat to select areas of the lake to provide cover for young fish and attract larger fish for improved angling opportunities. Two different habitat structure types were developed and installed in Lake Mohave for evaluation prior to deployment into Lake Mead. A total of 50 structures we deployed in FY15

Habitat barge with a PVC structure ready for deployment at Lake Mead

consisting of PVC cubes and fishing structures. Additionally, staff received SCUBA training and acquired SCUBA gear for conducting fish counts via SCUBA on the habitat structures.

Pheasants Forever Sage Grouse Positions

NDOW is helping fund two Sage Grouse Initiative positions in Elko, Nevada. These positions are also being funded by the Natural Resource Conservation Service and Pheasants Forever to develop and implement on-the-ground projects in Greater Sage-grouse habitat. The staff has been working with private landowners to facilitate understanding of habitat needs and the relationship of such needs to private land production practices. Projects such as noxious weed abatement, meadow restoration and PJ removal have been completed and demonstrate the ability of the program to help develop trust and implement meaningful projects.

Winnemucca Greenhouse Labor Support

The purpose of this project was to provide financial support for growing plants at the two greenhouses located in Winnemucca and at the middle and high schools. The project is important for NDOW's ongoing post-fire re-vegetation projects in the surrounding area. This area has been hit hard by wildfires in recent years and the re-vegetation projects are important to improve wildlife habitat conditions. The project involves students from both schools and many kids have also volunteered to help NDOW in the field on planting projects. This project's funding also continued into FY 16.

Winnemucca Greenhouse

Lake Mohave Aquatic Habitat Development

Lake Mohave is an aging reservoir suffering from a lack of aquatic habitat. Installation of artificial habitat structure helps attract fish and allow for spawning in greater numbers. Cover provided by the habitat improves recruitment success and leads to greater fish abundance, thereby increasing angling opportunities. In FY15, 25 PVC structures, 26 brush bundles, and 47 poly shrubs were constructed and installed into five coves in Lake Mohave with the assistance of U.S. Bureau of Reclamation (USBR), National Park Service, Arizona Game and Fish Department, and NDOW volunteers. NDOW staff completed SCUBA surveys to assess fish use of habitat, as well as perform routine underwater maintenance of habitat structures. SCUBA surveys yielded an average of 26 fish observed per minute on habitat structures, versus less than 3 fish per minute in coves without habitat structures.

PVC structure stuffed with nonnative tamarisk that was cut down along the shore lines and ready for deployment on the habitat barge at Lake Mohave

Condor Canyon Tributary Habitat Restoration

Condor Canyon contains designated critical habitat for the federally threatened Big Spring Spinedace. In November 2012, the BLM reconnected a perched spring to the main channel of the stream for the purpose of increasing water flow into critical habitat for Big Spring Spinedace; however, a large head cut formed where the spring water empties into the main channel. This head cut is too large of a barrier for the Big Spring Spinedace to pass and prevents utilization of the spring tributary. The purpose of this project is to restore the tributary channel and connection by developing a gentler slope and creating a series of grade control structures (i.e., riffles and pools) that will allow for fish passage and decrease potential for head cutting. In FY15, project planning was conducted with an independent company specializing in geomorphology and hydrology. The company developed a project design and provided technical assistance. Additionally, rock material needed for grade control structures was sourced. Completion of the construction phase is expected within two more years.

Topaz Lake Aquatic Habitat Development

Topaz Lake is located in Douglas County, NV and has historically been a trout fishery; however, summertime fishing is poor. Largemouth bass have been present since the 1940's and smallmouth bass since about 2008. Anglers lately appear to be catching more smallmouth bass, but numbers are still low. Since 2007, efforts have been made to improve summer fishing by improving bass habitat by placing out Christmas trees. This has shown limited success since Christmas trees breakdown rapidly and provide little protection for juvenile fish. Longer lasting habitat structures are needed.

Twelve habitat structures were purchased from Mossback Racks (see the photograph). On June 24 and 25, 2014, these structures were constructed at the Douglas County boat launch and taken to four areas around Topaz Lake. The lake level at the time was about 30 feet below maximum capacity and at each location habitat structures were sunk about six feet deep on the bottom with concrete block anchors. Structures should remain submerged regardless of the water demands since the minimum pool is controlled by the depth of the outlet. The Mossback Rack structures have not degraded and are expected to remain intact for many years to come. Even though it is difficult to assess the overall contribution of these structures to habitat in the lake, smallmouth bass have shown an increase in abundance and body size over the past couple of years.

Habitat structure being placed in Topaz Lake

Survey and Closure of Abandoned Mines

In FY15 NDOW used HCF funds to conduct Abandoned Mine Land wildlife surveys to support a joint program with the Nevada Division of Minerals (NDOM), BLM and the U.S. Forest Service (USFS). The wildlife surveys are conducted at abandoned mines being considered for closure throughout the state. The surveys are used to determine the wildlife value of these sites. These sites are being considered for closure because they are considered a public safety hazard. Data from the surveys conducted by NDOW personnel are used by the BLM, USFS and NDOM to determine if bat and bird compatible gates are to be used at the abandoned sites. On the other hand, if the surveys determine a site is not important to wildlife, then it is permanently closed without a gate.

Lockes Ranch Invasive Species Control

The funds for this project were spent on the removal of invasive Russian olive and salt cedar trees on the Lockes Ranch property in Railroad Valley, Nye County. Areas of both olive and salt cedar represent a major impediment to habitat restoration on both upland and spring outflow areas on the property. Because of their location in sensitive or difficult to access areas the invasive species stands cannot be adequately controlled using mechanical equipment. This project funded NDF work crews for 10 days of hand cutting olive/salt cedar and treating the stumps with approved herbicides. The consolidated slash was burned.

East Schell Range Habitat Restoration

The East Schell Bench restoration project is located in Hunt Unit 111. Until the late 1990s, the East Schell Bench provided crucial habitat for the Area 11 mule deer herd as well as important sage grouse, elk and pronghorn habitat. Numerous fires

have burned the area over the past 20 years and the habitat has become degraded. Recent efforts have focused on restoring this important piece of habitat. The HCF fund money was used for purchase and planting of Wyoming sagebrush, mountain sagebrush and bitterbrush along the east side of the Schell Creek Mountains north of Highway 50. Additional funding from NDOW and the BLM has been used to treat weeds, purchase and apply seeds and to provide monitoring of the vegetation restoration.

South Fork Humboldt Weed Control

The goal of this multi-year project is to control weeds at the South Fork State Recreation Area. NDOW recognizes the importance of the South Fork State Recreation Area in providing recreational opportunity for the public in terms of boating, fishing and hunting while at the same time providing valuable wildlife habitat. The park's proximity to Elko and Spring Creek generates significant public use issues. In an effort to contain existing weed populations and limit their spread, NDOW partnered with the Nevada Division of State Parks and the Nevada Division of Forestry to manage weeds on State-owned lands. To this end, NDOW provided chemicals and equipment for use in combating weeds on South Fork State Recreation Area. Chemicals were utilized to target tall whitetop, hoary cress, and Scotch thistle.

Spruce Mountain Habitat Restoration Project

This multi-year project was authorized by a 2012 BLM decision. Since then, implementation efforts have targeted prioritized areas for treatment with the following objectives:

- Reverse the expansion of pinyon-juniper woodlands to provide resilient habitats with an adequate understory which meet ecological site descriptions;
- Improve existing crucial winter habitat and forage palatability for mule deer and elk;
- Prevent catastrophic large-scale wildland fires resulting from the buildup of fuels and the conversion of fuel type based on prediction from historic assessments;
- Improve plant and wildlife species composition and diversity;
- Reverse the decreasing quality of wildlife habitat and forage due to damage from wildfires and pinyon and juniper encroachment; and
- Prevent the establishment and expansion of invasive, non-native species.

In fiscal year 2015, HCF monies ($12,000) were used to purchase seed during the implementation of an 800 acres Pinyon-Juniper chaining project in the Spruce Spring area. In all a total of 10,000 acres is authorized for treatment under the current decision through various treatment methods including chaining, mastication, hand thinning, and burning.

Spruce Mountain project area prior to treatments

Overton WMA Pond Leveling

HCF funds were provided to Ducks Unlimited to conduct survey work and prepare a topographic base map that will be used in the future leveling of Pintail and Wilson ponds at the Overton WMA. The design will be a cut and fill balance that will result in more uniform pond bottoms that eliminate overly deep areas and spread water to areas that in the present state do not support shallow ponded conditions. The design will also improve water delivery and drainage, improving NDOW's ability to manage waterfowl habitat. These improvements will allow NDOW staff to more efficiently conduct moist-soil management to increase production of desirable waterfowl forage. This project will provide better habitat for waterfowl and also improve hunter access.

Jiggs Reservoir Habitat Enhancement

This project was initiated to make repairs to the centuries old dam structure, deepen the reservoir, and increase the amount of clay in the soil at Jiggs Reservoir. This funding allowed for the entire dam structure to be rebuilt and updated, while increasing fish habitat by deepening a portion of the reservoir bottom. This portion of the deepened reservoir was then lined with Bentonite clay to reduce the amount of water lost to seepage during the winter months. This multi-year project included contributions of both time and moneys from multiple sources, including private land owners, state and federal agencies, Elko County, Barrick and Newmont mining companies, and hired contractors. This project was completed in the fall of 2014 and the authorization to impound water was released in April of 2015. In the spring of 2016, NDOW was able to stock rainbow trout, largemouth bass and bluegill sunfish into this small family fishery.

Jiggs Reservoir Dam prior to construction

Jiggs Reservoir Dam after construction

Highlights of Habitat Conservation Fee Projects Funded in FY16

Humboldt River Watershed Restoration Project

In FY16 NDOW continued to financially support the HWCWMA with HCF funds. The same type of work described above for FY15 also took place during FY16.

Eagle Valley Reservoir Aquatic Habitat Enhancement

Livestock grazing occurs in the watershed upstream of Eagle Valley Reservoir, which creates excessive nutrient input into the reservoir and ultimately deteriorates water quality. Warm surface temperatures of Eagle Valley Reservoir combined with this excessive nutrient input creates low dissolved oxygen, excessive littoral vegetative growth, and summer algae blooms. The reservoir typically stratifies in summer, creating an anoxic hypolimnion (deep water zone). This anoxic zone results in a loss of available habitat to sport fish and has the potential for mass fish kills as the reservoir turns over. Installation of an aeration system will reduce stratification in the reservoir, and provide oxygen to those areas of the lake which were oxygen deprived (oxygen). A new powerline was installed in fall 2015 and a new transformer and aeration system subsequently installed in early 2016. The aeration system runs

on a timer which allows for adjustments based on seasonal temperatures and photoperiod. The aeration systems powers multiple weighted airlines connected to diffusers throughout the reservoir. Nevada Division of Forestry and Lincoln County Power District provided assistance with installation.

Diversity Division Summer Conservation Aid

In FY16, the small amount of remaining funds awarded to this project was used to help fund two Great Basin Institute seasonal aids who continued assistance with nongame wildlife surveys. These surveys focused primarily on shrew and bat Species of Conservation Priority. Data collected from these surveys is being used to refine species distribution models, improve understanding of habitat affinities, and inform survey protocols.

Ash Springs Fencing

Ash Springs is a geothermal spring complex located in Ash Springs, Nevada and is the only location in the world where the endemic and federally endangered White River Springfish occurs. Approximately 85% of Ash Springs occurs on private property and the remaining 15% is on public land managed by the Bureau of Land Management (BLM). A small and decrepit chain-link fence ran along the west side of the private property and along the east side of US 93. This small fence had been repeatedly knocked down in numerous locations, which allowed for human trespassers to enter the private property and access Ash Springs from the highway shoulder. Trespassers littered Ash Springs with garbage and various chemicals including bleach, gasoline, and diesel fuel. Trespass also resulted in damage to the riparian vegetation and aquatic habitat that are critical for White River Springfish and sensitive mollusk species. The goal of this project was to replace the existing, decrepit chain-link fence with a newer and more secure fence to better protect Ash Spring's sensitive habitat and aquatic ecosystem. This project successfully removed 1,400 feet (ft) of old chain link fence, and installation of 780 ft of black, 6 ft tall wrought iron fence in its place. The remaining 620 ft of fencing was replaced and funded through the US Fish and Wildlife Service's Partners for Fish and Wildlife Program. This new fencing is much sturdier and harder to break through, as well as it matches the fencing in place on adjacent land managed by the BLM. The Nevada Department of Transportation provided jersey barriers along the highway shoulder to further protect the new fencing and Ash Springs. The private land owner did site preparation, vegetation restoration, and old fence removal.

Wildlife Surveys and Closures of Abandoned Mines

In FY16 the HCF program continued to fund the AML survey work described above in the FY16 section.

Restoration of Habitats Impacted by Wildfire

$36,533 of HCF funds were used to apply seed mixes via aerial seeding contracts on the Dixie and Boulder fires in Elko County as well as the Blue Jay, Coombs and Stonehouse fires in White Pine County. These areas were prioritized based on their associated key wildlife species including Sage grouse, mule deer and elk.

Ash Springs

Rye Patch Reservoir Carp Removal

The purpose of this project originally was to remove excess carp from Rye Patch Reservoir in order to increase available habitat for sportfish. However, in October of 2015, a large-scale fish die off occurred in the reservoir. Thus these project funds were diverted to extensive netting and fisheries survey work to assess the extent and scale of the fish die off. A commercial fishing operation, Nevada Carp LLC, was contracted to assist NDOW in conducting fish survey and inventory work on Rye Patch Reservoir. Fish surveys were conducted throughout the reservoir utilizing a 1,200 foot purse seine during March, April and June 2016. Information collected during these surveys was extremely valuable in developing stocking recommendations to rebuild the sport fishery post die off. This project was conducted in coordination with the Nevada Division of State Parks.

GIS and Related Wildlife Monitoring Support

NDOW's GIS staff used HCF funding during FY16 for the same type of work described in the section above for the FY15 GIS project.

Pheasants Forever Sage Grouse Positions

The use of HCF funds to partially fund these positions continued during FY16 and is described in the section above regarding FY15 HCF projects.

Western Region Aquatic Habitat Projects

Complex aquatic habitat promotes healthy and abundant populations of many fish species through protection from predation and production of invertebrate food sources. Available habitat also attracts larger fish and in turn increases opportunities for anglers. Many of the region's reservoirs and ponds lack beneficial habitat for fish,

especially during periods of low water. The purpose of the project is to install artificial habitat structures in fisheries where complex habitat is lacking. Each individual structure consists of a pvc trunk with composite limbs which simulate sunken trees or root structures that would be found in a natural environment. A total of 121 habitat structures were placed in Rye Patch Reservoir (18), Sparks Marina (17), Verdi Ponds (17), Chimney Reservoir (16), Virginia Lake (15), Lahontan Reservoir (13), Topaz Lake (10), Wilson Commons (6), Rose Creek Reservoir (6), Baily's Pond (2), Mitch Park Pond (2), and Liberty Pond (1). The structures will not only increase survival of stocked fish by providing protection from aquatic and avian predators, but will also improve natural recruitment of warm water fish species and forage fish by providing protection for young fish.

Henderson Bird Viewing Preserve Habitat Improvement

In conjunction with the City of Henderson, the U.S. Fish and Wildlife Service, Audubon Society, Nevada Division of Forestry and public volunteers, NDOW staff removed decadent and dead material at the Henderson Bird Viewing Preserve. Invasive Tamarisk was also removed. Additional restoration activities performed included the rehabilitation of the newly cleared areas with the planting of perennial native nursery stock and willow cuttings, followed with a protective mulch cover. Monitoring of the planting sites has shown a high survival rate of the new plantings due to the proximity of available water, subsequent manual watering, and timely precipitation events. Additional vegetation clearing and the addition of mulch cover is planned for FY17.

City of Henderson's Bird Viewing Preserve

Winnemucca Greenhouse Labor Support

The use of HCF funds to pay for labor costs at the Winnemucca Greenhouse continued during FY16. Additional information regarding this project is found in the FY15 HCF projects section above.

Longdoctor Pinyon-Juniper Thinning Project

The Longdoctor PJ Thinning project is an ongoing effort to restore sage grouse habitat in the Bi-State sage grouse management area. The HCF funding was used to treat approximately 2,000 acres within a large (~45,000 acre) treatment area. Funds from the HCF account were combined with other NDOW funding, USFS funding and in-kind contributions from local ranchers. This combining and leveraging of funding allowed for a much larger and ecologically meaningful project to be undertaken. The project at Longdoctor and the larger East Walker Restoration project are still underway. In 2017, 4,000 acres of PJ will be thinned near the Longdoctor site.

Pass Creek Meadow Enhancement

The purpose of the Pass Creek Fence Project is to improve the Pass Creek Meadow for the benefit of sage-grouse, chukar, mule deer, and other wildlife. Livestock use on Pass Creek Meadow in the Pine Forest Range occurs during the hot summer months, in which use is concentrated on the meadow and riparian resources. Heavy livestock use has degraded the quality of habitat for wildlife throughout Pass Creek Meadow resulting in weed issues, head cuts, and overall habitat degradation. We are in the process of fencing the Pass Creek Meadow using pipe-rail, as it is durable, low maintenance, and wildlife-friendly (i.e. is permeable to wildlife). Additional barbwire fence will be installed in adjacent areas along with weed treatments and prescription grazing to improve the habitat in this area. Grazing will continue to occur on Pass Creek Meadow, but under strict control with utilization not exceeding a 4 inch stubble height. We are working cooperatively with the Natural Resources Conservation Service and private landowners as they are developing a Sage-grouse Initiative Plan for weed treatments, grazing prescriptions, and habitat improvements. In addition to the fencing project, NDOW paid for road improvements up Pass Creek because this road washed out during 2015/2016 storm events.

Lockes Ranch Weed Control

This project continued during FY16 and is described in the section above regarding FY15 HCF projects.

Sage Creek Fish Barrier

The purpose of this project was to protect an extant population of Lahontan cutthroat trout (LCT) in upper Sage Creek, which is part of the Lahontan Cutthroat Trout Recovery Program. The project involved the construction of a fish passage barrier on Sage Creek to prevent upstream movement of non-native rainbow trout coming from McDermitt Creek. Habitat Conservation Fee funding provided a 50% match to funds from Trout Unlimited (TU) for construction of the barrier. TU hired a qualified contractor (Otis Bay, Inc.) to construct a K-rail barrier to create a fall with approximately a 3-ft drop, thereby creating a physical barrier for fish moving upstream.

Black Mountain Phone Line Removal

This project was described in the FY15 HCF projects section above.

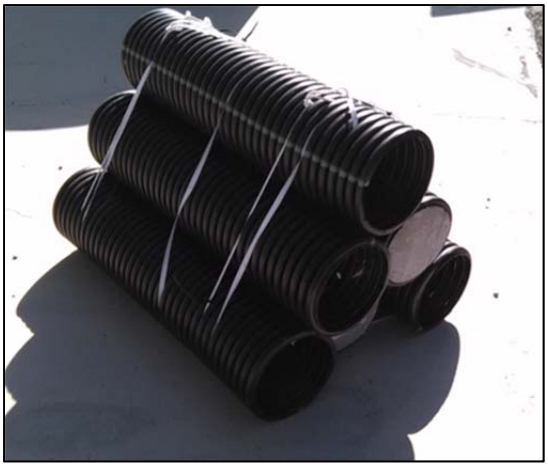
Lake Mohave Aquatic Habitat Improvement

As noted in the FY15 section above, Lake Mohave is an aging reservoir suffering from a lack of aquatic habitat. Installation of artificial habitat structures will help attract fish and allow for spawning in greater numbers. Cover provided by the structures will improve recruitment success and lead to greater fish abundance, thereby increasing angling opportunities for anglers. Construction and installation of 13 habitat structures in three coves was completed during FY16 with assistance from the USBR, National Park Service, Arizona Game and Fish Department, and NDOW volunteers. SCUBA surveys yielded an average of 16 fish observed per minute on habitat structures, versus less than 3 fish per minute in coves without habitat structure. New NDOW staff completed SCUBA training to be able to conduct fish counts on the habitat, as well as perform routine underwater maintenance of habitat structures. Necessary SCUBA equipment for new staff was purchased, as well as maintenance and repairs to the habitat barge's motors and trailer.

Largemouth Bass and Bluegill utilizing habitat structures in Lake Mohave

Lake Mead Aquatic Habitat Improvement

As mentioned for FY15, Lake Mead is an aging reservoir that lacks aquatic vegetation and habitat structure and has suffered long-term drought conditions that have not allowed for the periodic inundation of shoreline vegetation. The development and installation of habitat structures will provide escape cover for young fish and also attract larger fish to provide more angling opportunities and angler success. Developing strategies for movement of habitat structures in Lake Mohave is necessary to demonstrate the suitability of such an approach in reservoirs with annually declining lake elevations, like Lake Mead. Two different types of habitat structures were installed in FY16, which included PVC cube structures and 'catfish condos'. Strategies were developed and practiced in FY16 for moving structures to various depths in anticipation of changing lake elevations in Lake Mead. Additionally, fish use and angler use surveys were completed in FY16.



'Catfish condos' made out of corrugated pipe and concrete were installed in FY16

NPCD Data Analyst Position

The Nevada Partners for Conservation and Development (NPCD) program hired a data analyst and vegetation survey supervisor partly with HCF funding. The NPCD provides crews to survey and monitor pre- and post-project conditions at select habitat restoration sites. The data collected help with understanding the success or deviation from success of particular projects. The person hired has been able to take the data set collected since 2010 and provide information summaries. The summaries and results have been used to help better establish new project sites and have helped influence the methods to be applied on future projects.

Habitat Conservation Fee Projects Funded in FY15

Name of Project	$ Spent in FY15
Humboldt River Watershed Restoration Project	$22,785
Diversity Division Summer Conservation Aid	$224
Toiyabe Sage Grouse PMU Wildlife Habitat Enhancement	$45,000
GIS and Related Wildlife Monitoring Support	$15,049
Lake Mead Aquatic Habitat Development	$5,964
Pheasants Forever Sage Grouse Positions	$30,363
Winnemucca Greenhouse Labor Support	$9,467
Lake Mohave Aquatic Habitat Development	$22,715
Condor Canyon Tributary Habitat Restoration	$6,639
Topaz Lake Aquatic Habitat Development	$1,200
Survey and Closure of Abandoned Mines	$19,973
Lockes Ranch Invasive Species Control	$7,500
East Schell Range Habitat Restoration	$30,690
South Fork Humboldt Weed Control	$4,520
Spruce Mountain Habitat Restoration Project	$12,000
Overton WMA Pond Leveling	$5,906
Jiggs Reservoir Habitat Enhancement	$150,000
Total	**$389,995**

Habitat Conservation Fee Projects Funded in FY16

Name of Project	$ Spent in FY16
Humboldt River Watershed Restoration Project	$29,939
Eagle Valley Reservoir Aquatic Habitat Enhancement	$7,295
Diversity Division Summer Conservation Aid	$21
Ash Springs Fencing	$21,675
Wildlife Surveys and Closures of Abandoned Mines	$48,608
Restoration of Habitats Impacted by Wildfire	$36,533
Rye Patch Reservoir Carp Removal	$5,500
GIS and Related Wildlife Monitoring Support	$11,227
Pheasants Forever Sage Grouse Positions	$60,000
Western Region Aquatic Habitat Projects	$15,081
Henderson Bird Viewing Preserve Habitat Improvement	$36,190
Winnemucca Greenhouse Labor Support	$9,820
Longdoctor Pinyon-Juniper Thinning Project	$72,835
Pass Creek Meadow Enhancement	$25,623
Lockes Ranch Weed Control	$4,500
Sage Creek Fish Barrier	$16,500
Black Mountain Phone Line Removal	$19,450
Lake Mohave Aquatic Habitat Improvement	$20,610
Lake Mead Aquatic Habitat Improvement	$2,503
NPCD Data Analyst Position	$9,708
Total	**$453,618**

Habitat Conservation Fee Program Financial Summary FY15-FY16	
Balance Forward to FY15	**$1,184,614.22**
FY15 Revenue	**$343,983.00**
FY15 Expenditures*	**$(427,613.44)**
Balance Forward to FY16	**$1,100,983.78**
FY16 Revenue	**$302,432.01**
FY16 Expenditures*	**$(464,631.48)**
Balance Forward to FY17	**$938,784.31**

* includes direct project costs, staff time, and indirect costs

STATUS REPORT OF NEVADA DEPARTMENT OF WILDLIFE'S UPLAND GAME BIRD STAMP PROGRAM REVENUE, PROGRAM EXPENDITURES AND PROJECTS UNDERTAKEN DURING FISCAL YEARS 2015 AND 2016

Highlights of Upland Game Bird Stamp Projects Funded in FY15

Columbian Sharp-tailed Grouse Re-Introduction

Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*; hereafter CSTG) historically occupied the Intermountain West, including northern Nevada where they were considered abundant in Elko County. However, populations were extirpated from Nevada by the mid-20th century and now occupy less than 10% of their historic range. In a collaborative, multi-agency effort to re-establish a viable population of CSTG in northeastern Nevada, 140 birds have been translocated from southeastern Idaho to Elko County, Nevada during April of 2013-2015. Of these, 92 females and 31 males have been marked with VHF transmitters and have been monitored by ground and aerial telemetry. This project is intended to establish a self-sustaining population of CSTG within the Bull Run Basin area north of Tuscarora in northern Elko County (Figure 1).

Figure 1 Bull Run Basin release area looking northwest towards Blue Jacket Peak, Elko County, Nevada.

During the 2015 capture and translocation effort, we captured 49 CSTG consisting of 34 females and 15 males. Of the birds released, 29 females and 10 males were outfitted VHF radio transmitters. Birds were released near an active CSTG lek

established from prior releases and offspring produced from those releases. This approach appears to have reduced immediate post-release dispersal from the release site.

2014 Monitoring Summary

During the 2014 field season (April – August 2014), USGS researchers recorded 422 telemetry locations from 43 CSTG (Figure 2). Unlike the 2013 season, most birds remained relatively close to the release site. The farthest known distance that a bird moved during the 2014 field season was 27.8 km, which occurred in September. On average, CSTG moved much shorter distances in 2014 compared to 2013. The average distance CSTG moved from the release site was 3.45 (± 5.23) km. Male CSTG moved farther than female CSTG, on average, and yearling male CSTG moved the farthest of all translocated CSTG (7.22 ± 5.65 km). Adult male CSTG moved an average distance of 3.89 (±7.51) km. There appeared to be no difference between the distance moved by yearling and adult female CSTG which travelled an average of 3.87 (± 4.96) km and 3.25 (± 5.12) km, respectively. Interestingly, a female that traveled nearly 25 km from the release site immediately following release returned a month later and spent the remaining half of the season in the release area. Most non-nesting and non-brood-rearing CSTG moved moderate distances, and others left the release area completely.

During 2014, 27 nests were identified of which 17 were successful (62.9 %), nine were depredated (33.3 %), and one was abandoned (3.7%). The average clutch size was 9.4 eggs. However, four nests were depredated before we could obtain accurate egg counts. When these nests were omitted, the average clutch size of CSTG in Nevada in 2014 was 10.5 eggs. During 2013–2014, cumulative average nest survival probability for the 37-day egg laying and incubation phase was 42.4% (95% CI, 24.1% - 59.7%).

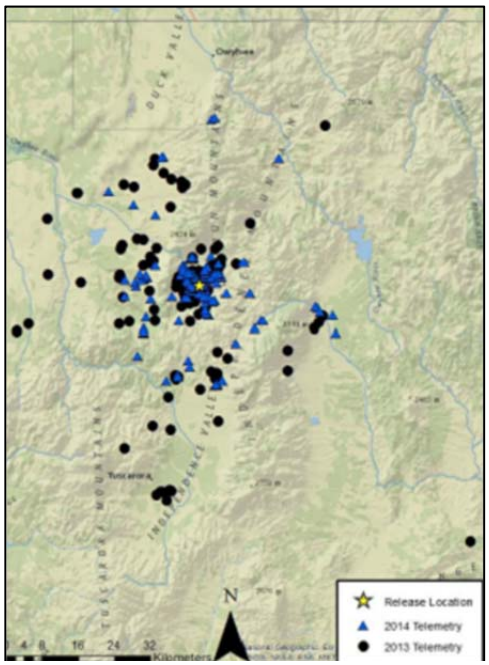
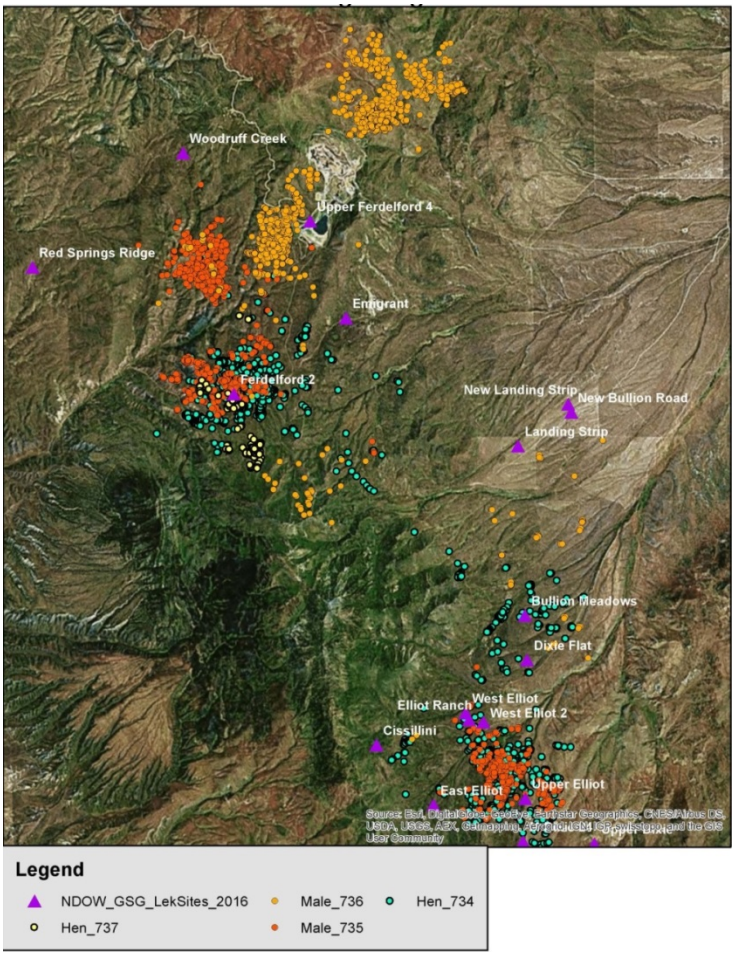


Figure 2. Locations of sharp-tailed grouse during the 2013 and 2014 field seasons.

Of the 17 broods identified during 2014, three broods were from non-collared females which we could not track. Of the 14 broods that could be monitored, seven females reared 20–23 chicks to an age of 50-days post hatch. One female was killed between days 45–50 and her chicks were not seen again, but they may have survived on their own at this age. Of the six failed broods, three females were killed while brood-rearing. Two broods had chicks that were 10–15 days old, while the third had chicks near 50 days post-hatch. During 2013–2014, the 10-day interval brood survival probability was 89.4% (95% CI, 79.9% - 94.5%) and the cumulative average survival probability for the 50-day brood rearing phase was 57.0% (95% CI, 32.6% - 75.5%).

Sage-grouse Telemetry Project

Four GPS Satellite PTT transmitters were purchased to outfit Greater sage-grouse in the Pinon Range in Elko County where historic and ongoing exploration exists, in addition to an active mine. Data collected from these units is intended to guide sound decisions and protection measures for sage-grouse during the development of future potential exploration, new mining or mine expansion projects. This information will be valuable for National Environmental Policy Act documents.



During March of 2015, birds were captured from the Ferdelford #2 and the Upper Ferdelford leks located within the South Fork Population Management Units. In partnership with USGS, two yearling hens and two yearling males were captured and outfitted with the GPS Satellite PTT transmitters. One hen died in April of 2015, but the remaining three collared birds provided extensive data until fall 2016 when two additional collars were retrieved. The data points collected have revealed seasonal use patterns of sage grouse within the Pinon Range and will be used to make informed decisions on land use mining related actions (see Figure to left).

Ruffed Grouse and Mountain Quail Translocation

In an effort to further develop mountain quail populations in northwestern Nevada, 100 mountain quail were obtained from south-central Oregon and translocated to the Vya Rim in Hunt Unit 011 during November 2014. The birds were wild caught in a sub-range of the Cascades near Myrtle Creek, Oregon and held at the Oregon Department of Wildlife's regional office in Roseburg. A subsample of birds (n=19) were tested for various diseases including Mycoplasma gallisepticum, Salmonella pollorum, and Avian Influenza (AI) as well as parasites such as coccidia and gapeworm by the Oregon Department of Agriculture, Animal Health Laboratory. Results for those diseases tested for were negative while coccidia levels were within normal ranges.

Mountain Quail

The intent of this release was to bolster existing populations with low numbers within and near the Horse Creek and Twelvemile Creek drainages along the Vya Rim in northern Washoe County. Although habitat conditions have been affected by drought, moisture receipts in November of 2014 prior to the release were substantial enough to spur some plant growth. This release will be augmented with a second release of approximately 100 quail during the winter of 2015-16 if conditions permit, both from an access and habitat suitability standpoint. The Upland Game Bird Stamp Program did not fund ruffed grouse translocation work during FY15.

Greater Sage-grouse Research and Monitoring

Virginia Mountains Sage-grouse Habitat Utilization and Distribution Project

This ongoing study is being conducted within a topographically-complex sagebrush-steppe ecosystem in the Virginia Mountains of northwestern Nevada, USA. The study area encompasses approximately 690.7 km^2 with elevations ranging from 1218–2683 m. The U. S. Department of Interior, BLM administers the majority of land, 588 km^2 in the study area, with the remaining portion owned privately (95 km^2). The Pyramid Lake Reservation borders the eastern portion of the Virginia Mountains and California borders the west. There are only two sage-grouse leks known to be active within the Virginia Mountains. One lek is located at Sheep Springs, near Fish Springs Ranch on the north slope of the Virginia Mountains. The other lek is located approximately 14 kilometers (km) to the southeast on Spanish Flat, near Tule Peak.

Lek Surveys – In 2014, three leks were confirmed active (three counts of ≥ 3 males). High counts for Spanish Flat and Sheep Springs leks were 21 and 16, respectively. West Cottonwood lek was discovered in 2011 by NDOW but was designated as inactive in 2012 and 2013. However, NDOW confirmed a high count of 17 males at West Cottonwood in 2014. High counts for males in 2013 at Spanish Flat and Sheep Springs were 34 and 20, respectively. These numbers are substantially lower than counts from

previous years. For example, the high counts for males on active leks in 2012 were 72 (Spanish Flat) and 34 (Sheep Springs), which were similar to counts from previous years.

Space-Use – We monitored a total of 166 sage-grouse with VHF transmitters during 2008−2014. The total number of males and females tracked by radio telemetry were 13 and 153, respectively. Most sage-grouse were relocated in the Spanish Flat area. From 2009 to 2014, the core area of sage-grouse activity (50% UD) during spring (March – May) was 1,363 ha and 816 ha for summer (June – July), according to pooled telemetry locations. The population level home range (95% UD) encompassed 7,797 ha during spring and 4,878 ha during summer. In each year, the core area was located at Spanish Flat. Sage-grouse captured from both lek sites used this area before moving to wintering areas. The majority of individual home ranges throughout spring and summer overlapped within the Spanish Flat area, indicating relatively less use of the Sheep Springs area.

Survival – Cumulative annual adult survival probability during 2009–2014 was 63.09% (95% CI, 54.82 – 70.30%). We recovered 30 marked sage-grouse mortalities during 2013 (*n* = 19) and 2014 (*n* = 11). Assumed cause of death included depredation by mammalian predators (*n* = 9), avian predators (*n* = 3), and unknown causes (*n* = 18). A majority of the unknown causes were transmitters identified as mortalities during fall through spring aerial telemetry monitoring, from which very little evidence remained to help identify the cause of mortality.

Nest Survival – Cumulative average nest survival probability for the 37-day egg-laying and incubation phase for study years 2009–2011 and 2013–2014 was 25.6% (95% CI, 16.9 – 35.3%). We did not use 2012 data in this survival estimation because we found very few nests in 2012 and nests were initially located during later stages of incubation due to field logistic constraints. Including these nests into the analysis may bias the estimation high because daily nest survival probabilities have been shown to increase as incubation progresses (Coates and Delehanty, 2010).

In six years, 107 sage-grouse nests were monitored (see Figure 3 on the next page) of which 49 were successful nests (first attempt = 41, second attempt = 8) and 58 were failed nests (first attempt = 54, second attempt = 4), of which we were able to determine that 42 were depredated (first attempt = 39, second attempt = 3). Four nests were partially depredated with ≥1 chick hatched. Signals were lost for several female sage-grouse during the study, perhaps because of radio failure or movement away from the region. The remaining radio-collared female sage-grouse did not attempt to nest, or nests were depredated prior to our detection during the laying period. Third nesting attempts were not observed.

Nest Habitat Selection – Preliminary findings suggest shrubs selected for nesting were larger in height, width, perpendicular width, and contained greater litter depth than shrubs measured at random locations. Females nested under various cover types. If multiple cover types were present at the nest site, the dominant species or structure occupying the greatest proportion of the nest was used as the main cover type. The most commonly used overhead nest cover was shrubs, but a rock outcrop (n = 1) and a juniper (n = 1) were also selected for nest cover. The most frequently used shrub species were big sagebrush (29%) and rabbitbrush (22%). Other vegetation included snowberry, bunchgrass, horsebrush, greasewood, bitterbrush, ephedra, serviceberry, dead sagebrush, three-tip sagebrush, black sagebrush, low sagebrush, winterfat, and choke cherry. Preliminary results below are reported as means (± Standard Error) of vegetation measurements for nest sites and random points.

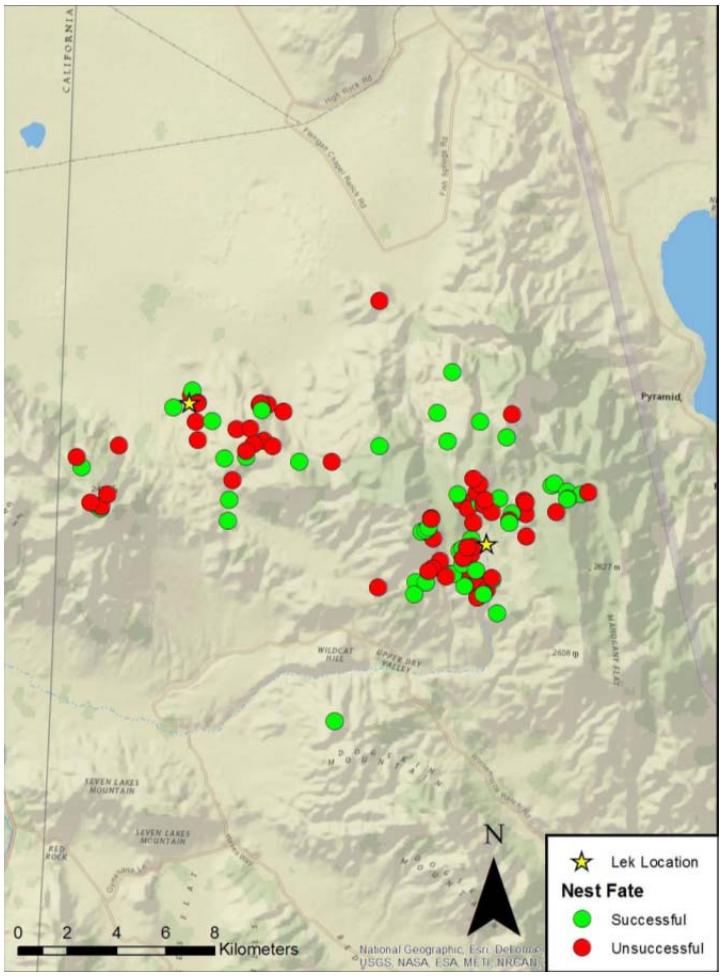


Figure 3. Sage-grouse nest site locations (successful and unsuccessful) within the Virginia Mountains.

Although all species of sagebrush were selected as the nesting shrub 35% of the time, the average sagebrush cover within 100 m of the nest was only 4.6 ± 0.7% (total shrub cover was 14.3 ± 0.9%). Conversely, non-sagebrush shrub species were being selected for across all spatial scales of use. Additionally, in comparing nest locations with DR and IR locations, mean sagebrush cover within 100 m was 4.7 ± 0.8% and 3.6 ± 0.6% (respectively), which further suggests lack of selection for overall sagebrush cover. Our preliminary results suggest that sage-grouse are selecting predominantly big sagebrush for the nest shrub and greater non-sagebrush shrub cover at the 5 m, 10 m, 25 m, 50 m, and 100 m scales.

When comparing the available habitat at both spatial scales (DR and IR locations), we found evidence for avoidance of annual cheatgrass at the nest (used= 4.9 ± 0.7%; DR= 7.6 ±1.1%; IR= 10.5 ± 1.4%). We did not distinguish cheatgrass from other annual grasses; however, we assume cheatgrass to be a majority of the annual grass category based on field observations. This effect is reduced as the distance from the nest increases. We found a greater selection of perennial grass cover at nesting sites

compared to IR points at the 10 and 25 m spatial scales, but not at the nest center, indicating perennial grasses may be important within the vicinity of nests.

Brood Survival – During 2009–2014, 55 broods were monitored. Twenty-eight females with broods were confirmed successful (≥1 chick survived to 50-days post-hatch) and 20 broods failed. Of the 20 unsuccessful females, 14 were confirmed as failed on or before the 25-day post-hatch interval. The remaining seven broods could not be relocated to determine survival at 50-day post-hatch; therefore, their fate is unknown.

The 10-day interval brood survival probability was 90.8% (95% CI = 85.8–94.1%) for 2009 through 2014. The cumulative average brood survival probability for 50-day brood rearing phase (probability of success through the brood rearing period) was 61.7% (95% CI = 46.5–73.8%) for 2009 through 2014.

Brood-Rearing Habitat Selection – Habitat use within 25 m of a brood-rearing sage-grouse shows evidence of greater selection for perennial forbs during the day (11.3 ± 0.8%) than at night (9.4 ± 0.8%). A general trend suggests that brood-rearing hens are selecting against cover at night (night = 11.2 ± 1.5%, day = 16.6 ± 1.7%, DR = 14.3 ± 1.6%) and are roosting on sparsely vegetated areas such as bare ground and rock (night = 16.5 ± 1.4%, day = 8.9 ± 0.9, DR = 14.2 ± 1.5%; Figure 17). Brood-rearing females also appeared to avoid annual grasses at used day compared to DR locations (day = 6.2 ± 0.6%, DR = 7.0 ± 0.6%); however, the difference was not significant. In general, conclusive differences were not found for selection of vegetative cover (excluding perennial forbs) for broods during the day when compared to DR points.

Desatoya Range Habitat Utilization and Effectiveness Monitoring

Summary – The U.S. Geological Survey (USGS) and NDOW initiated a before-after study design to investigate potential effects of habitat enhancement and restoration on sage-grouse population vital rates, habitat selection, movement patterns, as well as effects on predator community composition, in the Desatoya Mountains in central Nevada. During 2013–2014, we radio- and GPS-marked 54 sage-grouse captured within the study area. In 2014, six of the ten leks were active, two were inactive, and two were not surveyed. We located 14 nests and monitored five broods. We conducted a total of 281 raptor, raven, and livestock surveys and detected 174 ravens during 103 surveys. Primary data collection efforts include gathering baseline data on space-use, habitat selection, and population vital rates.

Lek Surveys – In 2014, six of the ten known leks within the study area were active, two were inactive, and two were not counted. Maximum male counts were 47 (Peterson Station), 29 (New Pass), 18 (Smith Creek), 15 (Haypress), 15 (Rock Creek), and 10 (Buffalo Hills). We did not observe any displaying males on Edwards Creek or Cedar Creek leks. North and South Topia leks are both alpine leks and were not accessible due to snow cover. We did visit the Topia leks in May, but did not observe any displaying males. However, due to the late survey date, these leks may have been active earlier in the breeding season.

Space Use – During October of 2013, we deployed GPS units on four female sage-grouse. During spring and summer 2014, we captured and marked 23 females and one male with VHF (*n* = 17) or GPS (*n* = 7) transmitters. During the fall 2014 trapping season, we captured and marked 25 females and one male with VHF (*n* = 19) or GPS (*n* = 6) transmitters. We obtained 134 telemetry locations from 28 collared hens during the first season of monitoring. A total of 13,211 GPS locations were collected between October 2013–2014.

We calculated utilization distributions by season (same months as outlined in above paragraph) for GPS-marked grouse. The core area of sage-grouse activity (50% UD) during spring, summer, fall, and winter was 1363, 640, 2003, and 2414 ha, respectively, and the population level home range (95% UD) was 10935, 4360, 13970, and 12237 ha, respectively.

We observed two general patterns of sage-grouse movement from spring breeding areas to summer habitat; grouse moved to either lowland riparian and agricultural complexes or to alpine areas within the Desatoya Mountains. We observed grouse congregating in the valley near Smith Creek and the surrounding agricultural fields (e.g., alfalfa fields). Grouse utilized resources near the creek during the day and roosted in the surround hills at night and were regularly observed flying or walking back and forth at dawn and dusk. Some GPS marked individuals moved from the Smith Creek valley to higher elevations near Edwards Creek. Two GPS marked females captured at Rock Creek lek moved from the valley to the mountains after their broods failed. In the Desatoya Mountains, it appears that birds are using springs and other ephemeral water sources near Edwards, Haypress, and Topia Creeks.

Greater Sage-grouse

During fall, sage-grouse activity was highly concentrated around Smith Creek, Edwards Creek, and Haypress, with some utilization along Smith Creek Valley towards the New Pass lek. However, during winter, sage-grouse began to congregate around lek sites and away from Smith Creek and high elevation areas. The lack of utilization in the mountains may be due to a small sample size (*n* = 1242 locations) from only two GPS-marked individuals during 2013. We believe there may be an undocumented lek between Smith Creek and New Pass leks, as a majority of sage-grouse marked this spring were approximately 8–10 km away from both of these leks. We also observed a group of about 15 males roosting in this area while trapping. The high concentration of females captured plus the group of males indicates a nearby lek, which will be investigated next season.

Sage-Grouse Survival – Average monthly adult survival probability was 98.9% (95% CI, 92.7 – 99.8%) and cumulative average adult survival probability during 2013–2014 was 87.7% (95% CI, 40.2 – 98.2%). We recovered five mortalities this season from VHF (n = 1) or GPS (n = 4) marked sage-grouse. Assumed causes of mortality include depredation by avian (n = 1), mammalian (n = 2), and unknown predators (n = 2). Two females were killed while nesting. On both occasions, feathers were found at the nest site with eggs either cracked, depredated, or untouched. One VHF collar was recovered at the base of a pinyon pine with some feathers, indicating probable avian depredation.

Nest Survival – In 2014, we located 14 nests, of which four were successful and 10 failed. Cumulative average nest survival probability for the 37-day egg laying and incubation phase was 9.4% (95% CI, 1.1% - 29.5%). Daily nest survival was 93.8% (95% CI, 88.5% - 96.8%). Of the failed nests, three were discovered empty, suggesting eggs may have been removed by a predator; two hens were killed either on the nest or within a few meters of the nest; and the remaining five nests were depredated. The only two marked hens on the west side of Desatoyas near Rock Creek lek nested and were successful. Nest survival within the Desatoyas was extremely low; however, this may be due to small sample size (n = 13) and therefore this preliminary result should be interpreted with caution. Multiple years of data are required to obtain a reliable estimate for nest survival.

Nest Habitat Selection – Preliminary results indicate that average percent shrub cover and sagebrush height were similar at nest sites, DR, and IR locations at all spatial scales, but values were higher at the nest center for all survey types. However, percent canopy cover for all shrubs and all sagebrush was significantly greater at used and DR locations than at IR locations, suggesting sage-grouse are selecting nest sites with greater sagebrush cover than what is available within the study area at IR locations. In addition, there was very little non-sagebrush cover (< 3%) at all nest and random points. Percent horizontal cover (0° and 45° angles) was greater at nests and DR points compared to IR locations, but only vertical cover (90° angle) at nests, not DR points, was greater than IR locations.

Brood Survival – All five broods monitored in 2014 failed. The 10-day interval brood survival probability was 96.3% (95% CI, 91.3% - 98.5%), and the cumulative average survival probability for the 50-day brood rearing period during was 15.1% (95% CI, 1.1% - 46.1%). Two broods failed before the 10-day check; two broods failed between the 30 and 40-day checks; the fifth brood was opportunistically trapped mid-season but failed between 30 and 40 days post-hatch.

Brood-rearing Habitat Selection – Preliminary results indicate that brood-rearing sage-grouse selected a greater percentage of horizontal shrub cover at used day locations than at night locations, but not when compared to DR points. In contrast, vertical cover was similar between day, night, and DR locations. Grouse appeared to roost in areas with lower vegetative cover at night and select greater cover during the day. Perennial forb cover appeared to be greater at day locations compared to night and DR points; however, results are not significant due to limited sample sizes (n = 6). Preliminary results also suggest average percent shrub cover is greater at day brood locations (0 m) compared to both night and DR points, but this difference was not statistically significant. Similarly, we did not find any difference in shrub cover between survey types at the 10 and 25 m spatial scales.

Forward Looking Infrared Surveys - Surveys utilizing aerial infrared (AIR) imaging were conducted under contract with Owyhee Air Research located in Murphy, Idaho. The surveys were conducted during the week of April 6-10, 2015. A total of 71 leks were surveyed in northeastern Nevada and involved the following population management units (PMUs):

- Desert PMU – 17 leks surveyed (10 active);
- Island PMU – 6 leks surveyed (5 active);
- O'Neil Basin PMU – 23 leks surveyed (14 active);
- Tuscarora PMU – 14 leks surveyed (5 active)

In conjunction with these aerial surveys, we coordinated with USGS researchers and technicians to position two observers each at a random subset of leks (n=38) over the survey period to conduct a double blind observation simultaneous to the fly over to compare results (Figure 4). The objective here is to arrive at a reliable correction factor that can be factored into population estimate calculations while being incorporated into a stratified random sampling scheme.

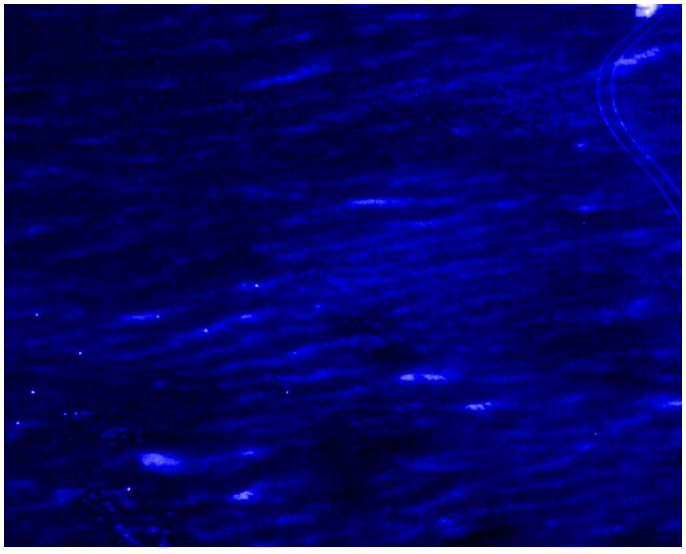


Figure 4. Aerial infrared image collected during sage-grouse lek survey. Note the observer's vehicle in the upper right hand corner and sage-grouse (white dots) in lower left corner.

Telemetry Flights (Fixed Wing – Owyhee Air Research)

In order to continue monitoring of radio-marked sage-grouse during the non-field season, we contracted with Owyhee Air Research and Black Mountain Air to conduct fixed wing surveys using radio-telemetry equipment. As of May 2015, just over 37 hours were spent documenting locations of VHF radio-marked sage-grouse as well as recording mortality signals from the units. The following areas were surveyed from September 2014 through May 2015:

- Vya/Massacre/Sheldon PMU complex (Washoe County);
- Virginia Mountains (Washoe County);
- Pine Nut Range (Lyon County);
- Pequop Mountains (Elko County)

Southern Nevada Small Game Water Development

Small game water developments (guzzlers) are cistern-based structures designed to capture precipitation in water limited environments. In the Southern Region, these guzzlers enhance habitat conditions for Gambel's quail and chukar partridge, but also provide benefits to a variety of non-game species. In FY15, the Southern Region Water Development Crew inspected and completed minor maintenance on 343 existing guzzlers, completely rebuilt two guzzlers, and removed one non-functioning guzzler. This work was conducted in Clark, Lincoln, Esmeralda and Nye Counties. Minor maintenance actions typically include repairs to fencing, storage tanks, frames, collection aprons, or plumbing. Staff also installed new signs at each guzzler to comply with SB 134. Inspections and minor maintenance is primarily achieved with the use of a helicopter, but ground access is also used for many units. Funding for this program was also provided by sportsman's donations and the NDOW Water Development Grant.

Greater Sage-grouse Riparian Use Assessment in Priority Habitat

During the initial phases of this project, much of the effort has been placed on developing a study plan and locating areas (meadows) used by wild horses and livestock and areas without wild horses within priority (core) sage-grouse habitats. A draft plan has been developed and is in review. So far, meadow systems have been located on 30 allotments that are within Wild Horse and Burro Herd Management Areas (HMAs) in core greater sage-grouse habitat. This process yielded 368 meadows of which a set of selection criteria will be applied to reduce the sample size and then a set of meadows (n=30, or one per allotment) will be randomly selected for monitoring. The meadows will be monitored with remote camera stations to determine ungulate use (occurrence and duration). Vegetation measurements will also be collected at each site. The eventual product from this project will be a thesis related to management scenarios and factors affecting Proper Functioning Condition of riparian systems and the response of lentic riparian forbs to horse and cattle use.

Kirch Food Plots

The purpose of this project was to enhance habitat for upland game birds, mule deer and waterfowl. Forty acres of the lower dove field was planted with Siberian

wheat and Austrian winter peas in September. In May, 40 acres of the upper dove field was planted with a mixture of cereal grains and native sunflowers. Forty acres of the Old Place Unit was planted in June, 2015. The moist-soil units within the Old Place Unit were planted with a summer seed mix composed of millets and cereal grains.

Toiyabe Sage Grouse PMU Habitat Enhancement

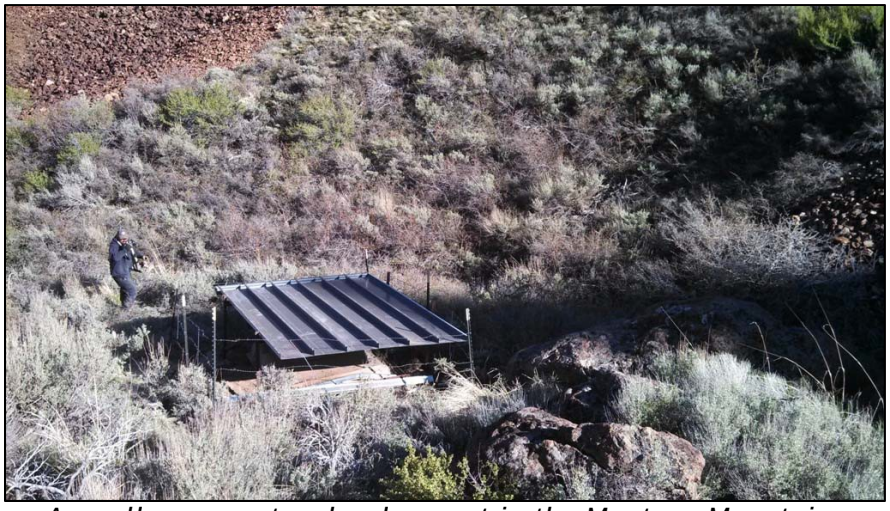
This multi-year project was authorized by several decisions rendered by Battle Mountain BLM. These decisions were put in place in an effort to facilitate the removal of pinyon and juniper trees within key sage grouse habitat in the Battle Mountain District/Mount Lewis Field Office. Monies provided through the Upland Game Stamp Program in FY15 were specifically used to make use of Bootstraps Crews (disadvantaged youth) from the Duck Valley Reservation to assist with tree removal within targeted sage grouse habitats. Lander County Cooperative Extension, in conjunction with the University of Nevada, Reno, developed this strategy for habitat enhancement on public lands while at the same time introducing youth to the many aspects of public land resource management. The program has been extremely successful in both goals – enhance sage grouse habitats, and introduce young people to resource management. In FY15, Bootstraps Crews focused on work within the Toiyabe PMU on the east and west sides of Mt. Callaghan in Lander County. Monies allocated through the upland game bird stamp program were matched with mitigation funds provided by ORMAT to mitigate impacts from the development of the McGuinness Hills Geothermal Plant.

Toiyabe Sage Grouse PMU Riparian Enhancement

A small amount of the funds awarded to this project were used to supplement what was used to fund the Bootstraps Crew work described under the previous project. Additional habitat improvements in riparian areas as part of this project has been put on hold pending necessary decisions and clearances from the BLM.

Northern Nevada Small Game Water Development

Small game water developments (guzzlers) in the Northern Region primarily enhance habitat conditions for chukar partridge, but also provide benefits to a variety of non-game species. In FY15, the Northern Region Water Development Crew inspected and completed minor maintenance on 528 existing guzzlers in nine different northern Nevada counties. Minor maintenance actions included fence repair, brush removal, cleaning out drinkers, repairing collection surfaces and repairing or replacing gutters. All of the inspections and minor maintenance activities were achieved with the use of a helicopter. Additionally, a total of 22 small game guzzlers were completely rebuilt or underwent major repairs with the use of ground crews. Staff also installed new signs at each guzzler to comply with SB 134. Funding for this program was also provided by sportsman's donations and the NDOW Water Development Grant.



A small game water development in the Montana Mountains

Post-Fire Upland Game Habitat Restoration

In conjunction with fire prevention projects associated with the BLM's Healthy Lands and Mojave Desert initiatives, NDOW implemented a restoration project by augmenting native vegetation at guzzler locations affected by wildfire and located in NDOW's Southern Region. The project sites are located in Lincoln County's Kane Springs Valley. NDOW's objective includes the planting of various species of native cover vegetation at selected upland guzzler sites restoring habitat structure and corridors at guzzlers within burned areas, thus increasing wildlife's confidence in using guzzlers and adjacent areas. The primary species benefitting are Gambel's quail, chukar, mourning dove, desert cottontail, and other wildlife species dependent on water. During FY15 and FY16, NDOW planted over 500 perennial native plants at or adjacent to 6 small game water developments. Monitoring of the planting sites has shown a high survival rate of the new plantings due to subsequent manual watering and timely precipitation events.

Upland Game Data Collection and Storage

Gambel's Quail

The goal of this project is to reduce paperwork and eliminate redundant steps to enter data into existing databases such as the Nevada Sage-grouse Lek Survey Database. The priority objective of this project was to develop an android based application, derived from the Nevada Department of Wildlife's existing lek count form, for use in an electronic tablet. NDOW contracted with the University of Nevada, Reno – Robotics Lab to develop the data entry application. The first version of the data application was delivered in March of 2015 and field tested shortly thereafter. After field testing, suggestions were provided to improve the application and the ability to view the entered data on a

server. Many of these things were addressed through an iterative process and are ongoing at this time.

Field biologists are currently using electronic tablets with the data application for sage-grouse lek counts. This has led to further suggestions that will improve the usefulness of the application. We view this first year of use as a pilot and expect to have a refined and improved version available for lek survey work in 2016. In addition, other similar applications may be developed for other upland game species such as ruffed grouse.

Sage and Columbian Sharp-tailed Grouse Workshop

The 29th Sage & Columbian Sharp-tailed Grouse Workshop was held in Elko, Nevada from June 17-19, 2014. In addition, a business meeting of the Sage and Columbian Sharp-tailed Grouse Technical Committee was held on June 16th. A total of 189 people registered for the workshop and 171 were present during the conference. The participants consisted of 60 state agency, 57 federal agency, 24 university, 10 consulting, 10 private, 7 energy and 3 conservation organization personnel.

Field Tour

A field tour was held on Wednesday, June 18th that took participants through northern Elko County near the historic mining and ranching community of Tuscarora. Stops were made at four locations to view and discuss the following:

1) Ruby Pipeline: energy and infrastructure related threats as well as rehabilitation;
2) Marsh Creek/Snow Canyon Fire Rehabilitation;
3) Geothermal energy development and associated infrastructure and noise disturbance;
4) Columbian sharp-tailed grouse re-establishment within Bull Run Basin

The stops and discussion during the field tour integrated well with several presentations given during the symposium sessions.

Symposium

Two days of symposia were held with four sessions each day. The session topics included the following:

Day One	*Day Two*
Habitat Selection	Techniques in Restoration, Monitoring and Translocation
Ecology and Natural History	Fire, Invasive Species and Climate Effects
Infrastructure	Population Estimation
Behavior and Resource Allocation Modeling	Conservation Planning

Banquet

At the evening banquet on Thursday, June 19th, the Robert L. Patterson award was presented to two recipients:

- Dr. Kerry P. Reese, Professor and Head of Fish and Wildlife Resources with the University of Idaho; and
- Clint McCarthy, Regional Wildlife Ecologist with the USDA, Forest Service – Intermountain Region

Both recipients provided a considerable amount of guidance over their careers with respect to research and management in furthering conservation of sage-grouse.

Eastern Region WMA Weed Control

This project is described in the section summarizing FY15 Duck Stamp Program projects. $3,750 of Upland Game Bird Stamp funds were used to supplement the Duck Stamp funds used on this project.

Highlights of Upland Game Bird Stamp Projects Funded in FY16

Columbian Sharp-tailed Grouse Restoration Project

Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*; hereafter CSTG) historically occupied the Intermountain West, including northern Nevada where they were considered abundant in Elko County. However, populations were extirpated from Nevada by the mid-20th century and they now occupy less than 10% of their historic range. In a collaborative, multi-agency effort to reestablish a viable population of CSTG in northeastern Nevada, 190 grouse from 15 lek sites in southeastern Idaho were translocated to Elko County, NV, during April 2013-2016. Of these, 122 females and 41 males were marked with VHF transmitters and were monitored by ground and aerial telemetry. In addition, a subsample of female CSTG were artificially inseminated prior to translocation to promote nesting and the rearing of broods at the release site (*n* = 6, 2014; *n* = 9, 2015*; n = 9, 2016*).

<u>Capture and Known Fate Results</u>

Columbian Sharp-tailed Grouse

During 2013, 50 CSTG were captured from 10 leks in southeastern Idaho and were translocated to northeastern Nevada. Of these, 49 birds were released, and one was euthanized due to injury. Thirty-six females and eight males were outfitted with VHF radio transmitters. One lek formed at the release site. Two males were observed displaying several times throughout April and May, and one female nested directly adjacent to the lek. Shortly before releases began in April 2014, four females (three non- collared) and two males (one non-collared) were observed displaying approximately 700 m from the 2013 release location. It is not known if the non-collared male was a yearling or a non-collared male from the

previous season, but the non-collared females were most likely the offspring of females translocated in 2013. Despite high mortality rates and low reproduction during 2013, a generation of Nevada-hatched CSTG were present and on the lek at the beginning of the 2014 season.

Forty-four CSTG were captured in 2014, but only 42 were released. One female was euthanized during processing, and one female died overnight in a release box. Of the birds released, 27 females and 13 males were outfitted with VHF radio transmitters. Two males were released without collars. Releasing CSTG near an active lek, rather than a simulated lek, appeared to have reduced immediate post-release dispersal from the release site. Several males quickly joined the active lek, and within two weeks of the release, 13 males were observed displaying at the lek.

In 2015, 51 grouse were captured and 49 were released in Nevada (*n* = 34 F, *n* = 15 M); five females and five males were released without VHF radio-collars. One female died during processing, and another was euthanized after discovering a trap-related broken wing. In 2015, we observed males displaying at the same lek that was present in 2014, but the lek shifted about 500 m from the original 2014 location. USGS personnel counted a max of three males and four females on lek prior to the first release, and NDOW personnel observed at least six displaying males prior to 2015 translocations. Grouse were released at the same location in 2015 as in 2014, and shortly after releases concluded, 16 displaying males were observed near the release location. While 16 displaying grouse was the highest lek count in 2015, 13 displaying males were observed three times at the same location. Within a month, birds from the single lek location (about 500 m from the 2014 lek) dispersed and formed three smaller groups, about 700 m apart from each other, forming a lek-triangle around the release location. Two five- male groups were observed regularly at two of the activity centers, and a smaller third group (1-5 males) was observed several times at a third activity center before lekking concluded in late May.

Nest Survival

During the first three years of this project, we have located 76 CSTG nests. Of these, 48 successfully hatched (63% apparent nest success). The daily survival probability and the probability that a nest would survive the entire nesting season increased each year of the study. The daily survival probability of a CSTG nest during all study years of the project was 0.984 (95% CI 0.974 – 0.990), and the cumulative nest survival probability during all years was 0.541 (95% CI 0.381 – 0.677).

Brood Survival

During 2013–2015, we tracked 45 females with broods (Figure 1). Of these, 27 successfully reared a minimum of one chick to 50-days old (60% apparent brood success). In that period, 27 successful brood-rearing females added a minimum of 81 chicks to the population. The daily survival probability of a CSTG brood across all years of the project was 0.990 (95% CI 0.984 – 0.994), and the cumulative survival probability that a brood would reach 50 days post-hatch across all years was 0.605 (95% CI 0.446 – 0.740).

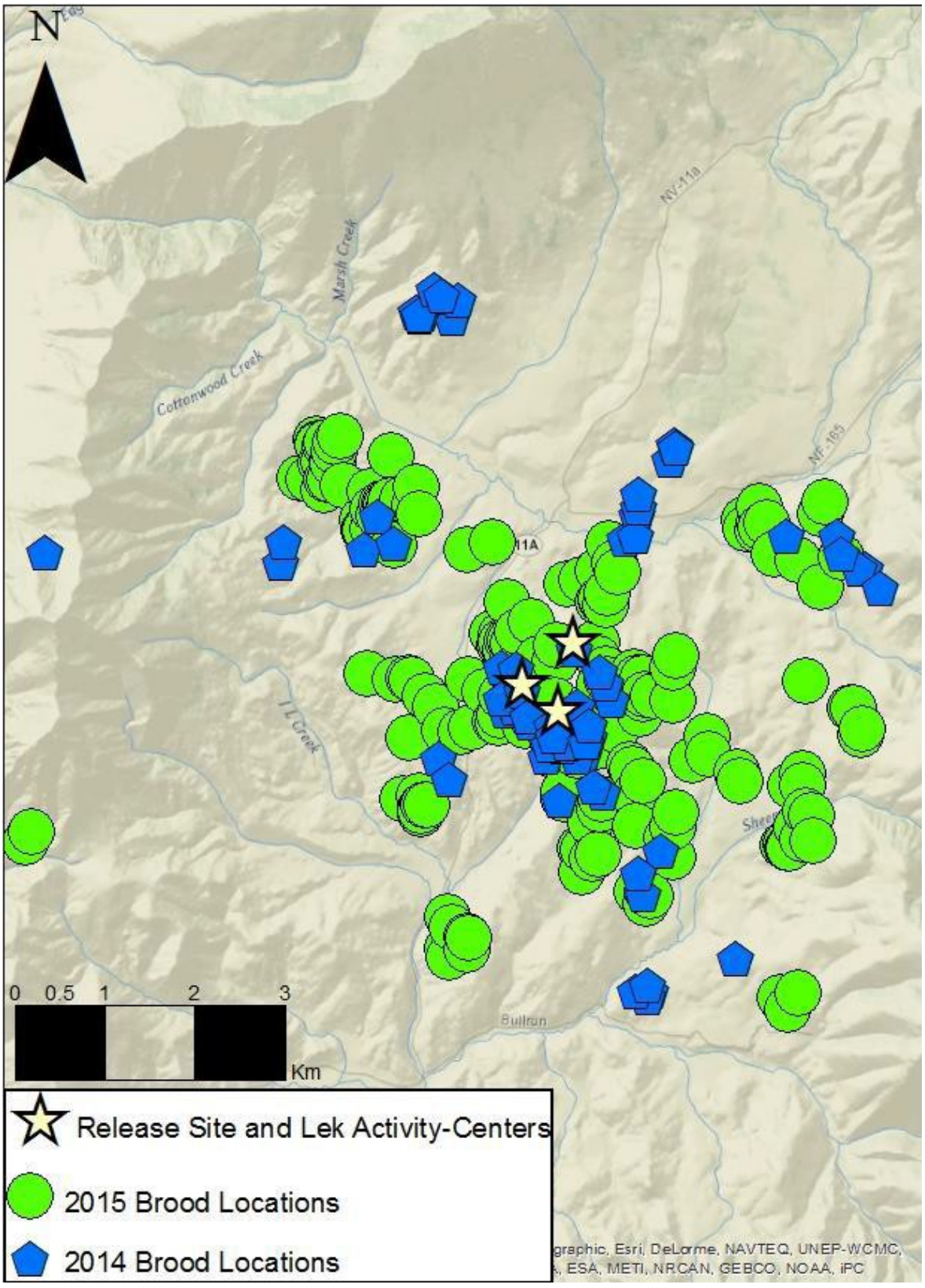


Figure 1. Brood locations of Columbian sharp-tailed grouse in the Bull Run Basin.

Greater Sage-grouse Research and Monitoring
Each component of this project is summarized below.

Lek Count Technicians
A seasonal lek count technician was used to assist with lek counts in the Eastern Region during April and early May of 2016. The technician spent 9 days in the field and counted 16 leks. This assistance provides field biologists with great relief during an extremely busy time of year. Additional seasonal lek count technicians were also used; however, they were largely funded directly by a Nevada Bighorns Unlimited Sage-grouse custodial account.

Aerial Lek Survey
There are 652 active and 262 pending active sage-grouse leks within the Nevada Department of Wildlife's Sage-grouse Lek Database. Due to the large number of leks and the difficulty in accessing several of the lek locations during the spring months, helicopter surveys provide a useful tool to survey several leks in one morning and get to remote locations not accessible by vehicle. In some cases, NDOW aircraft are used to conduct these surveys; however, due to conflicts with spring deer surveys, we also contract aerial services through El Aero. During FY16, we used El Aero Services to conduct sage-grouse lek surveys in the following areas:

- Humboldt County: Black Rock Range, Montana Mountains, Pine Forest Range and the Santa Rosa Range;
- Churchill County: Desatoya Mountains
- Mineral County: Wassuck Range (Mount Grant)
- Lyon County: Pine Nut Mountains and Desert Creek/Sweetwater Range

Approximately 22.6 hours of helicopter lek survey time was covered by Upland Game Bird Stamp funding in FY16.

Fixed Wing Infrared Surveys
Aerial infrared (IR) surveys were conducted during the week of April 11 – 15, 2016 by Owyhee Air Research. The majority of these surveys took place in northern Elko County; however, a day of IR survey also took place in the Battle Mountains of Lander County. In Elko County, 36 leks were surveyed using the aerial IR technique (20 leks were surveyed in the Upper Humboldt Basin and 16 leks were surveyd in the Upper Owyhee watershed of the North Fork Population Management Unit). These leks were also surveyed simultaneously by U.S. Geological Survey (USGS) wildlife technicians (double blind counts) via ground observation to determine the difference between results of the aerial IR survey and actual on the ground counts. This will assist with developing valid correction factors for the IR survey.

In addition to surveying known leks, NDOW worked cooperatively with the USGS to set up "pseudo" leks using captive reared pheasants. Pheasants have a similar spectral image to sage-grouse and were tethered to stakes to prevent escape. A total of 20 "pseudo" leks of varying size were set up to determine how well the aircraft

performed when searching for new or unknown leks using the aerial IR technology. Results of the survey have not been provided as of this writing; however, this monitoring should be integral to the development of a publication on the practical use of new infrared technology that illustrates both advantages and limitations.

Fixed Wing Telemetry Surveys

NDOW uses Upland Game Bird Stamp funding to acquire locations of VHF radio marked grouse through a contracted vendor, Owyhee Air. Owyhee Air has provided this service for several years and their overall performance has been exceptional. As of April 2016, Owyhee Air has conducted approximately 32 hours of aerial survey to either locate marked sage-grouse or obtain a mortality signal to help determine monthly survival estimates for the population. Locations are mostly obtained during the fall and winter months when research and monitoring crews have left the field. The areas where populations have been aerially monitored in FY16 include the following:

- Pine Nut Mountains (Lyon County);
- Virginia Mountains (Washoe County);
- Hayes Canyon Range/Nellie Springs Mountain (Washoe County);
- Sheldon National Wildlife Refuge (Washoe/Humboldt County);
- Mount Grant (Mineral County);
- Desert Creek/Sweetwater (Lyon County)

Columbian Sharp-tailed Grouse Technical Support

Technical support was provided to develop "The Guidelines for the Management of Columbian Sharp-tailed Grouse Populations and their Habitats", which was published in 2015. There were 11 contributing authors to the document and required several years to develop. Contributions from the Nevada Upland Game Stamp Program were made to support the printing costs of the document. The suggested citation is as follows:

Hoffman, R.W., K.A. Griffin, J.M. Knetter, M.A. Shroeder, A.D. Apa, J.D. Robinson, S.P. Espinosa, T.J. Christiansen, R.D. Northrup, D.A. Budeau, and M.J. Chutter. 2015. Guidelines for the management of Columbian sharp-tailed grouse populations and their habitats. Sage and Columbian Sharp-tailed Grouse Technical Committee, Western Association of Fish and Wildlife Agencies, Cheyenne, Wyoming, USA.

The guidelines include sections on conservation status, population ecology, habitat requirements, population management and related guidelines, habitat management and related guidelines and restoration recommendations. The purpose of the approximately 60 page document is to update the Giesen and Connelly guidelines published in 1993 by providing the most current knowledge on Columbian sharp-tailed grouse ecology, breeding and production surveys, predation, translocations, hunting, disease and genetics as well as address new threats and develop additional recommendations for habitat management. The document is available at the

following URL link:
https://cpw.state.co.us/Documents/WildlifeSpecies/SpeciesOfConcern/Columbian-ST-Guidelines.pdf

Ruffed Grouse and Mountain Quail Translocation

Mountain Quail Restoration Project

The focus of the mountain quail restoration project for the past two years has been to augment and expand existing mountain quail populations in the extreme northwest corner of Nevada in Hunt Unit 011. Over the last two years, 200 mountain quail have been released into the Horse Creek drainage just north of the Barrel Springs Road. In early December of 2015, 100 mountain quail were obtained from southwestern Oregon and released approximately 4.5 miles northwest of the initial release location in Horse Creek in 2014. The 2015 augmentation represented the final release of mountain quail currently planned for this portion of Nevada. Released birds are expected to help bolster the low density population that existed prior to the augmentations. Small coveys of mountain quail have been reported to NDOW in several different locations along the Vya Rim.

Ruffed Grouse Establishment Project

NDOW's Game Division initiated a ruffed grouse capture and translocation operation in late August/early September of 2015 to obtain birds for an augmentation of the species in the Toiyabe Range in Nye County. Trapping took place from August 27 – September 10, 2015 and a total of 40 ruffed grouse were captured consisting of 12 adults and 28 juveniles. Birds were held between 24-48 hours and transported to Stewart Creek located in the west-central portion of the Toiyabe Range (Figure 3). Two individuals died during the translocation process, which concluded on September 11, 2015. Thirty eight ruffed grouse were released during the effort, consisting of 12 adults and 26 juveniles. Each bird was banded with a uniquely numbered leg band.

Figure 3. Stewart Creek release site in the Toiyabe Range.

Ruffed grouse are now established in the Birch Creek/Big Creek portion of the Toiyabe Range in Lander County from releases conducted in 2009 and 2012. The 2015 augmentation of the Toiyabe Range population should allow for establishment not only within Stewart Creek, but within

adjacent drainages such as Clear Creek, Illinois Creek and possibly even the North Twin River on the east side of the mountain range. Developing two core populations with the potential for establishing another core population in the future somewhere in between (e.g. San Juan and Washington Creek drainages) would allow for the interchange of individuals and a much larger, well connected population.

Southern Nevada Small Game Water Development

Small game water developments (guzzlers) are cistern-based structures designed to capture precipitation in water limited environments. In the Southern Region, these guzzlers enhance habitat conditions for Gambel's quail and chukar partridge, but also provide benefits to a variety of non-game species. In FY16, the Southern Region Water Development Crew inspected and completed minor maintenance on 65 existing guzzlers and completely rebuilt two guzzlers in Clark, Lincoln, Esmeralda and Nye Counties. Minor maintenance actions typically include repairs to fencing, storage tanks, frames, collection aprons, or plumbing. Inspections and minor maintenance was completed by ground crews. Funding for this program was also provided by sportsman's donations, and the NDOW Water Development Grant.

Bi-State Greater Sage-grouse Monitoring

This year represents the first year of a three year project to capture, radio-mark and follow-up on sage-grouse through their seasonal life stages within the Desert Creek and Mount Grant Population Management Units (PMUs). USGS field crews are collecting data that will be used to investigate habitat selection and areas of utilization, estimate vital rates (e.g., nest, brood, and individual survival), and relate those vital rates to environmental factors, including the presence of specific predators. The crew has successfully concluded trapping and deploying VHF units on sage-grouse and is now concentrating efforts on monitoring leks, tracking collared grouse and locating nests.

Capture Results

During the field season, 23 sage-grouse have been captured and outfitted with VHF units: 10 at Mount Grant and 13 at Desert Creek. Units were deployed on females at each active lek to represent the entire study site.

Monitoring Results

These results are considered preliminary at this time due to this being the inaugural year of this effort. Thirty-eight telemetry locations have been obtained from 26 birds during the months of March and April. Ten females out of 22 active collars have been located in Mount Grant while 16 out of 21 radio-marked birds have been located in Desert Creek. Two individuals are outfitted with GPS units, which transmitted a total of 377 points during January - April.

Monitoring radio-marked females has resulted in the discovery of 12 nests: 3 at Desert Creek and 9 at Mount Grant (Figure 4). The first nest was discovered on 10 April. As of 25 April, 10 nests are still active. Nests are monitored every third day to determine whether the nest has succeeded, failed, or is still active. One mortality

has been confirmed this season. The mortality occurred over the 2015 – 2016 fall and winter season. The cause of death is unknown but likely due to mammalian depredation, as evidenced by teeth marks and chewing on the VHF unit. Two other mortality signals have been detected but are currently inaccessible due to snowpack conditions on Mount Grant.

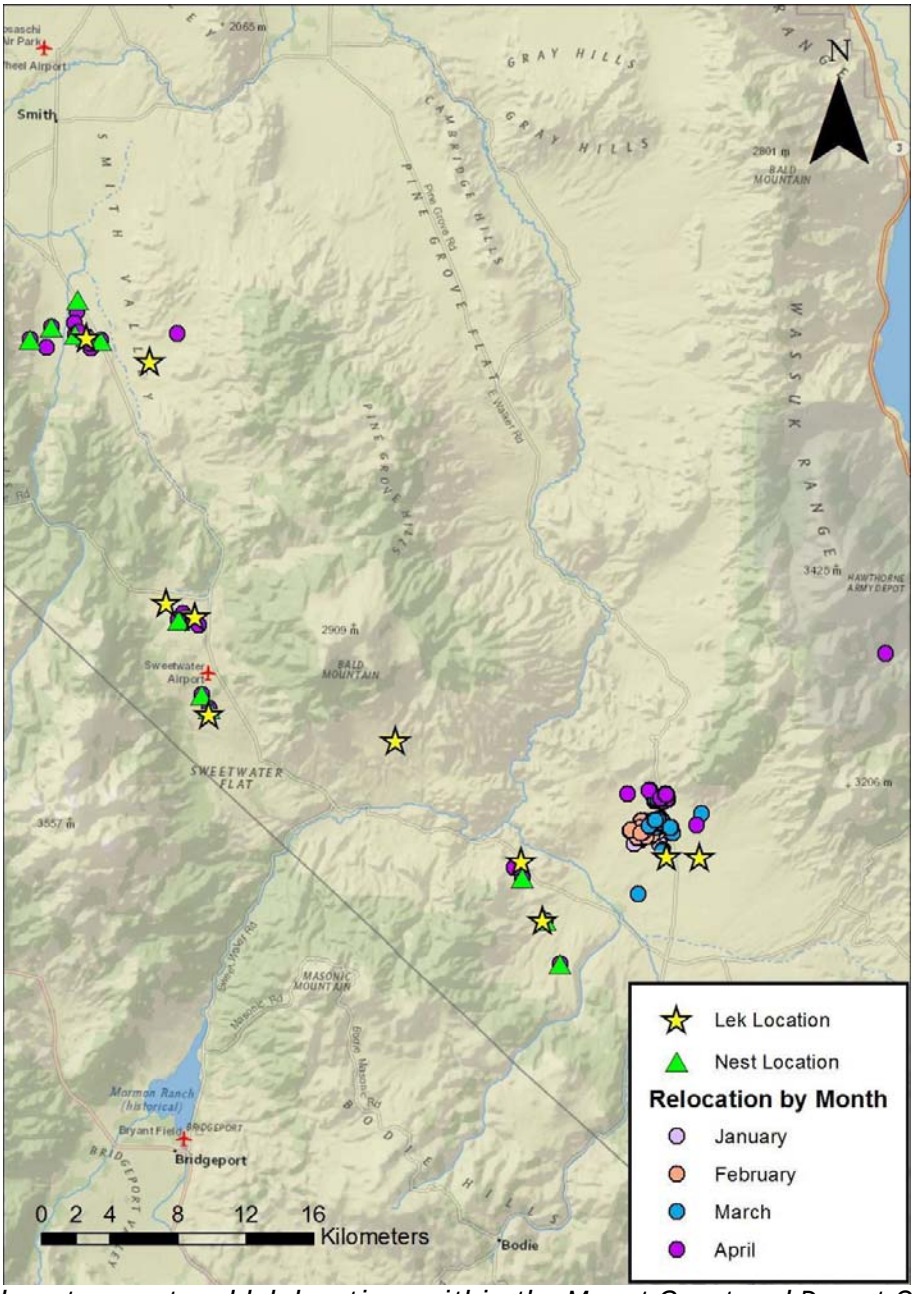


Figure 4. Telemetry, nest and lek locations within the Mount Grant and Desert Creek PMUs.

Key Pittman WMA Food Plots

Approximately 60 acres were planted in October with winter wheat soft white, cereal Fall rye, barley, and hairy vetch as a winter cover crop. An additional 45 acres

were planted in December with ryegrass, tall fescue, sand dropseed, and Sandberg bluegrass to enhance desirable vegetation in areas where the removal of noxious weeds left areas that were lightly vegetated or bare ground. During late February, 60 acres were over-seeded with spring wheat, oats, barley, native annual sunflower, small burnett, Rocky mountain bee plant, sainfoin, hairy vetch, Austrian pea, and alsike clover. Selected areas along the shoreline of the upper ponds were hand seeded in June 2016 with millet and native sunflower. All seed varieties planted were hybrid varieties intended to increase forage production in feeding areas on the WMA and to enhance hunting opportunities and to discourage invasive plants.

Buffalo Hills Medusahead Mapping

Project planning is ongoing in collaboration with the Nevada Department of Agriculture, Washoe County, Nevada Land Trust, Buckhorn Land & Livestock, BLM, NDOW, NRCS, and Nevada Bighorns Foundation. Work has begun treating noxious weeds across approximately 880 acres and is expected to continue through Spring, 2017. Weed mapping is on-going, with targeted species including medusahead, Scotch thistle, Canada thistle, and Russian knapweed. Treatment and mapping efforts are occurring in priority habitat management areas for greater sage-grouse and crucial winter habitat for mule deer and pronghorn.

Monitoring the Effects of Landscape-Level Treatment on Greater Sage-grouse within the Desatoya Mountains of Central Nevada

NDOW and the U.S. Geological Survey Western Ecological Research Center (USGS) initiated a before-after study design to investigate the potential effects of landscape scale habitat enhancement and restoration projects on sage-grouse population vital rates, habitat selection, movement patterns, as well as effects on predator community composition, in the Desatoya Mountains located in central Nevada. The BLM, in collaboration with NDOW and Smith Creek Ranch, have proposed a landscape-scale, multi-year integrated habitat restoration and maintenance project (also known as the Desatoya Mountains Habitat Resiliency, Health and Restoration Project) to improve wildlife habitat and restore degraded vegetation communities within the Desatoya Mountains through singleleaf pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*; hereafter PJ) removal treatments and restoration of sagebrush communities, wet meadows, and other riparian complexes over a ten year period (BLM 2012). Proposed habitat enhancement and restoration actions that will directly impact approximately 32,000 acres include various PJ removal treatments (20 – 100% removal), fencing to protect wet meadows and riparian areas, stabilizing stream channels, and wild horse removal.

Capture Results

During 2013–2015, 84 sage-grouse were captured and outfitted with VHF radio or GPS – Satellite PTT devices within the study area. In 2014 and 2015, six of the ten known leks were active, two were inactive, and two were not surveyed within the Desatoya Population Management Unit (PMU). During both seasons of monitoring, 34 nests were located, 13 broods were monitored, and 372 ground telemetry locations were obtained. A total of 643 raptor, raven, and livestock surveys were performed

with the detection of 404 ravens during 232 surveys. Primary data collection efforts include gathering baseline data on space-use, habitat selection, and population vital rates. Further data are required to reach conclusions concerning sage-grouse populations in the Desatoya Mountains.

Movement Patterns

Two general patterns of sage-grouse movement from spring breeding areas to summer habitat were observed; grouse moved to either lowland riparian and agricultural complexes or to alpine areas within the Desatoya Mountains (Figure 5). Grouse were observed congregating in the valley near Smith Creek and the surrounding agricultural fields (e.g., alfalfa fields). Grouse utilized resources near the creek during the day and roosted in the surrounding hills at night and were regularly observed flying or walking back and forth at dawn and dusk. Some GPS-marked individuals moved from the Smith Creek valley to higher elevations near Edwards Creek. Two GPS-marked females captured at Rock Creek lek moved from the valley to the mountains after their broods failed in 2014. In the Desatoya Mountains, it appears that birds are using springs and other ephemeral water sources near Edwards Creek, Haypress, and Topia Creek.

Brood Monitoring

All five broods monitored in 2014 failed. In 2015, we monitored eight broods, of which two were successful, five failed, and one was unknown. The 10-day interval brood survival probability was 74.8% (95% CI, 57.3% - 86.1%), and the cumulative average survival probability for the 50-day brood rearing period during was 23.4% (95% CI, 6.2% - 47.2%). In 2014, two broods failed before the 10-day check; two broods failed between the 30 and 40-day checks; the fifth brood was opportunistically trapped mid-season but failed between 30 and 40 days post-hatch. In 2015, three broods failed before the 10-day check; two failed between the 10 and 20-day checks, and one failed between the 30 and 40-day checks.

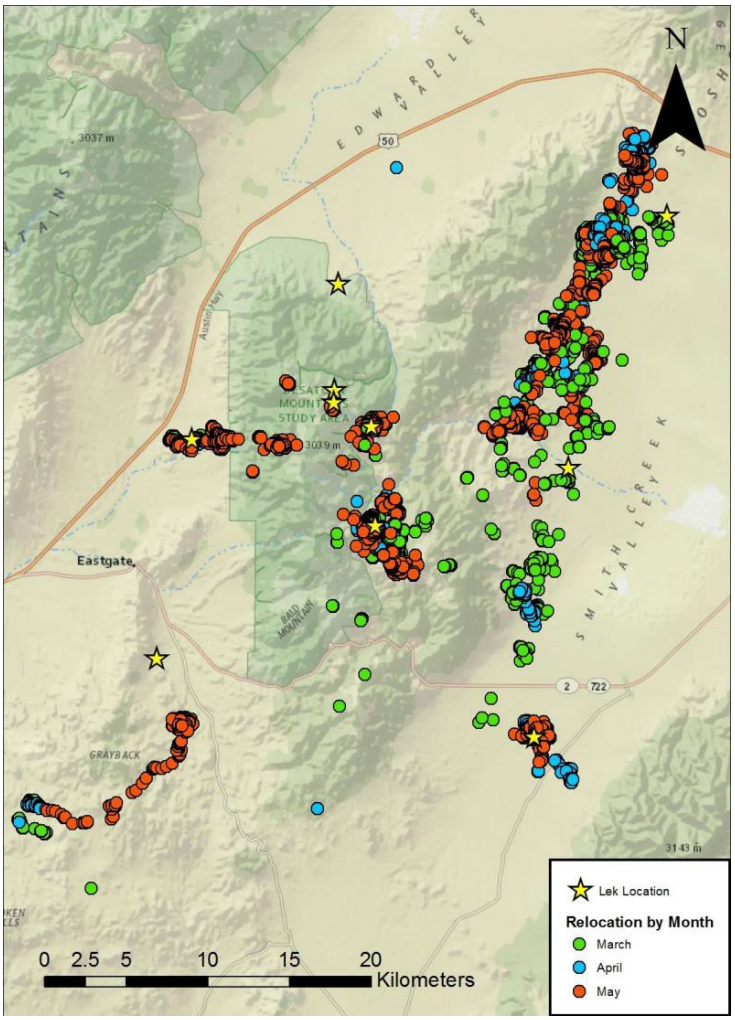


Figure 5. GPS locations during spring (n=10,290) by month in the Desatoya Mountains, 2014 – 2015.

Post-Fire Upland Game Habitat Restoration

A description of this project is found in the section summarizing FY15 Duck Stamp Program projects.

Black Mountain Telephone Line Removal

The removal of 10 miles of an abandoned telephone line and associated posts near Black Mountain has been completed. This project will not only reduce perching and nesting substrate for raptors and ravens in a greater sage grouse nesting area, but will make aerial surveys safer for anyone that flies in unit 074. All of the telephone line was removed and posts were cut to ground level.

Determining the Effects of Raven Control on Greater Sage-grouse Vital Rates in the Virginia Mountains

The initial impetus for investigating the Greater sage-grouse population in the Virginia Mountains was to better understand movement patterns and vital rates prior

to an anticipated renewable energy development (wind) proposed for the Tule Ridge/Spanish Flat portion of the mountain range. This provided a good opportunity to develop a classic before, after, control impact study design to accurately depict any effects that the development might have on the population. Research and monitoring activities were initiated in 2009 working in cooperation with the U.S. Geological Survey – Western Ecological Research Center (USGS). Subsequent to this, the wind energy project was withdrawn due to the importance of the area to sage-grouse and other wildlife concerns (e.g. golden eagle nesting). Still, the project provided valuable insight into the population dynamics of the area and two publications were developed from the research efforts including Lockyer et al. 2013 on nest predator identification published in the Journal of Fish and Wildlife Management and Lockyer et al. 2015 on nest site selection and reproductive success in a fire impacted habitat published in the Journal of Wildlife Management. The prior study demonstrated that cumulative nest survival in the Virginia Mountains was 22.4%, well below other published estimates for the Great Basin of between 36 and 43%, with common ravens being the most common nest predator. Thus, it was determined that this area represented an opportunity to conduct targeted raven control work and to determine the effects on the population both during and after treatment. This year represents the third year of intensive raven control work in the Virginia Mountains.

Sage-grouse Movement Patterns

From 2009 through 2015, a total of 216 sage-grouse with VHF transmitters have been monitored. The total number of males and females tracked by radio telemetry were 15 and 201, respectively. Most sage-grouse were relocated in the Spanish Flat area. From 2009 to 2015, the core area of sage-grouse activity (50% UD) during spring (March – May) was 2,937 ha and for summer (June – July) was 816 ha, according to pooled telemetry locations. The population level home range (95% UD) encompassed 15,730 ha during spring and 4,319 ha during summer. In each year, the core area was located at Spanish Flat. The majority of individual home ranges throughout spring and summer overlapped within the Spanish Flat area (Figure 6).

Nest Survival

Cumulative average nest survival probability for the 37-day egg-laying and incubation phase for study years 2009–2011 and 2013–2015 was 26.3% (95% CI, 18.4 – 34.9%). We

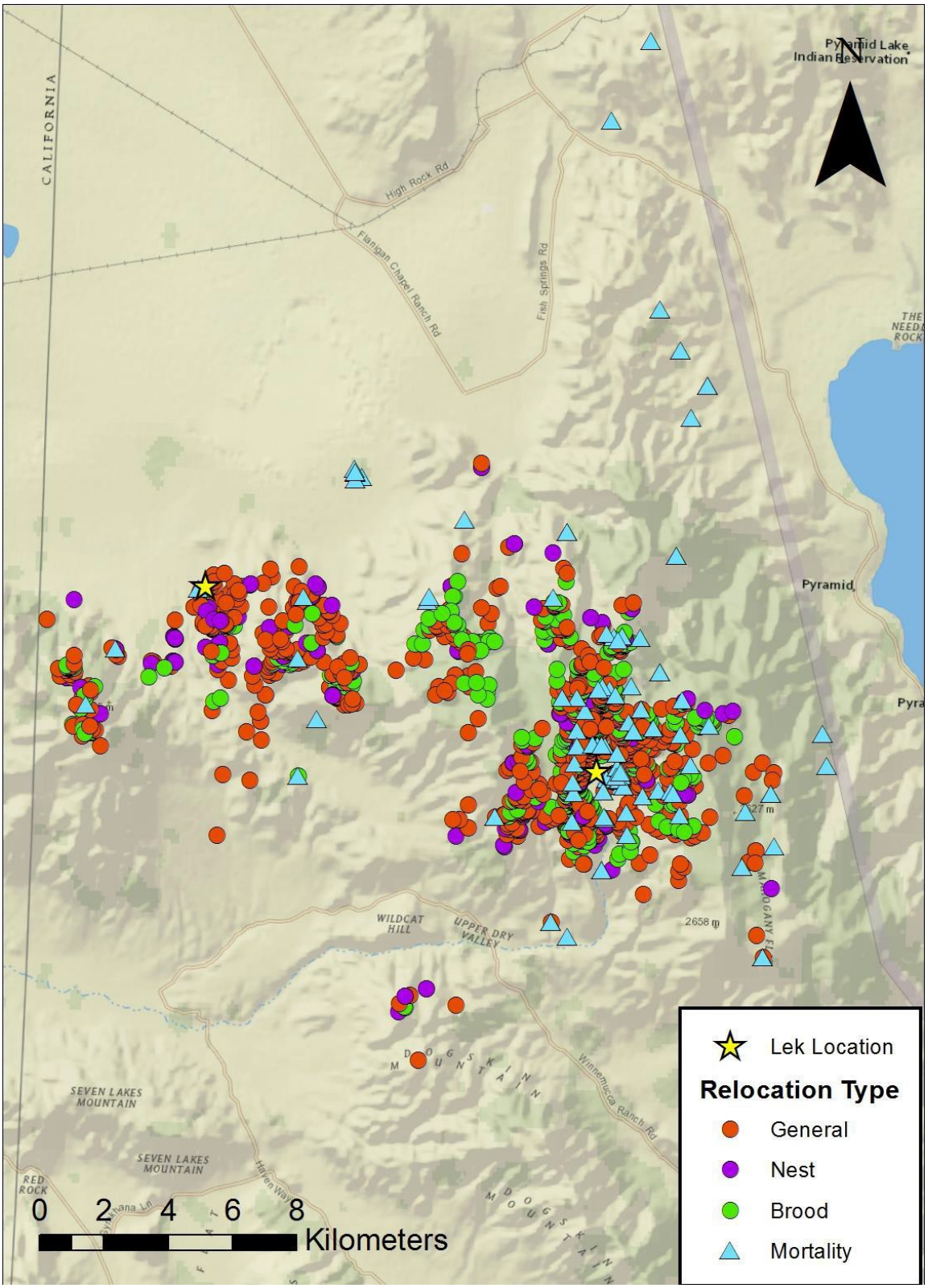


Figure 6. Greater sage-grouse telemetry locations through 2015.

did not use 2012 data in this survival estimation because we found very few nests in 2012 and nests were initially located during later stages of incubation due to field logistic constraints. In seven years, 130 sage-grouse nests were monitored. Of these, we documented 59 successful nests (first attempt = 51, second attempt = 8) and 71 failed nests (first attempt = 66, second attempt = 5), of which we were able to determine that 50 were depredated (first attempt =48, second attempt = 4). Four nests were partially depredated with ≥1 chick hatched. Signals were lost for several female sage-grouse during the study, perhaps because of radio failure or movement away from the region. The remaining radio-collared female sage-grouse did not attempt to nest, or nests were depredated prior to our detection during the laying period. We did not document third nesting attempts.

Sage-grouse Nest Videography

Fifty-one nests were video-monitored during 2009 (*n* = 6), 2010 (*n* = 16), 2011 (*n* = 17), 2014 (*n* = 2), and 2015 (*n* = 10). Nest depredations, partial nest depredations, and successful hatches were recorded. We calculated nest survival for video-monitored nests in the same manner as described for all nests in Section 4.4. The reason for calculating survival of video-monitored nests both together and separately from all nests was to determine if video-monitored nests are more or less likely to fail. Nest survival across all video-monitored nests for 2009–2011 was 43.7 ± 0.1% (means ± SE), with yearly survival rates of: 22.2% ± 0.1 (2009), 35.0% ± 0.1 (2010), 60.6% ± 0.1 (2011). Successful hatching was recorded at 22 nests. Predator activity was recorded at 19 nests, of which 16 nests were depredated, 2 nests were partially depredated, and one nest hatched with no eggs apparently lost directly due to removal by the predator. Both partially depredated nests still hatched ≥1 egg following the event. Depredation was the primary cause of sage-grouse nest failure. Nest predators were avian, mammalian, and reptilian. Predation of both eggs and chicks were recorded at the nest. Ravens were the most frequent sage-grouse nest predator in the Virginia Mountains, accounting for 39% of nest predation events.

Brood Survival

During 2009–2015, 67 broods were monitored. Thirty-three females with broods were confirmed successful (≥1 chick survived to 50-days post-hatch) and 26 broods failed. Of the 26 unsuccessful females, 16 were confirmed as failed on or before the 25-day post- hatch interval. The remaining eight broods could not be relocated to determine survival at 50-day post-hatch; therefore, their fate is unknown. The 10-day interval brood survival probability was 90.9% (95% CI = 86.6–93.9%) during 2009–2015. The cumulative average brood survival probability for 50-day brood rearing phase (probability of success through the brood rearing period) was 62.2% (95% CI = 48.6–73.1%) for 2009–2015.

Estimating Greater Sage-grouse Vital Rates in Novel Habitats

U.S. Geological Survey field crews initiated the first field season of monitoring greater sage-grouse populations in the Monitor Valley and Santa Rosa field sites on March 8, 2016. The field crews will collect data used to investigate habitat selection and areas of utilization, estimate vital rates (e.g., nest, brood, and individual

survival), and relate those vital rates to environmental factors, including the presence of specific predators. The crews concluded sage-grouse trapping on 9 April and are currently tracking birds. Field efforts are now focused on locating and monitoring nests.

Monitor Valley Capture Results

Capture was initiated on March 8, 2016 and 16 female sage-grouse were captured and outfitted with VHF transmitters. Monitoring efforts are now focused on locating birds and their nests using radio-telemetry. Field technicians have located 23 of 44 marked females (VHF = 43; GPS = 1). An aerial telemetry flight located several missing birds, but 10 individuals are still considered missing at this time. In addition, 674 locations have been obtained from two GPS transmitters during January – April (Figure 7).

Monitor Valley Monitoring Results

As of 25 April, three nests have been discovered. The first was found on 22 April; all three nests are currently still active. Nests are monitored every third day to determine success or failure. After the fate of a nest is determined, we conduct habitat surveys at the nest site to characterize the vegetation selected by the grouse.

So far, four mortalities (two VHF and two GPS) have been recovered. The GPS mortalities occurred during the late fall and winter, so minimal evidence of predation was found and only feathers remained. Remains at one VHF mortality were a head and collar, which was buried under a sagebrush. The second VHF mortality had remains of body and primary feathers.

Santa Rosa Capture Results

Capture was initiated on 8 March, and 30 female sage-grouse were captured and outfitted with VHF units throughout March and early April. Females were captured from a high proportion of the known leks in the Santa Rosa Mountains to obtain a representative sample across the study area.

Santa Rosa Monitoring Results

Telemetry locations have been obtained from 27 of the 30 active VHF collared females during the months of March and April. An aerial telemetry flight has recently been conducted to aid in relocating missing birds. Flights provide crews with reliable ground locations for birds that have not previously been found. Monitoring radio-marked females has resulted in the discovery of four nests. As of 25 April, all four nests were still active. We will continue to monitor nests every three days in order to determine nest fate. No mortalities have been observed thus far. We will recover and report mortalities as they occur throughout the field season.

Kirch WMA Food Plots

The work associated with this project during FY16 is the same as described above for this project in the FY15 Upland Game Bird Stamp projects section.

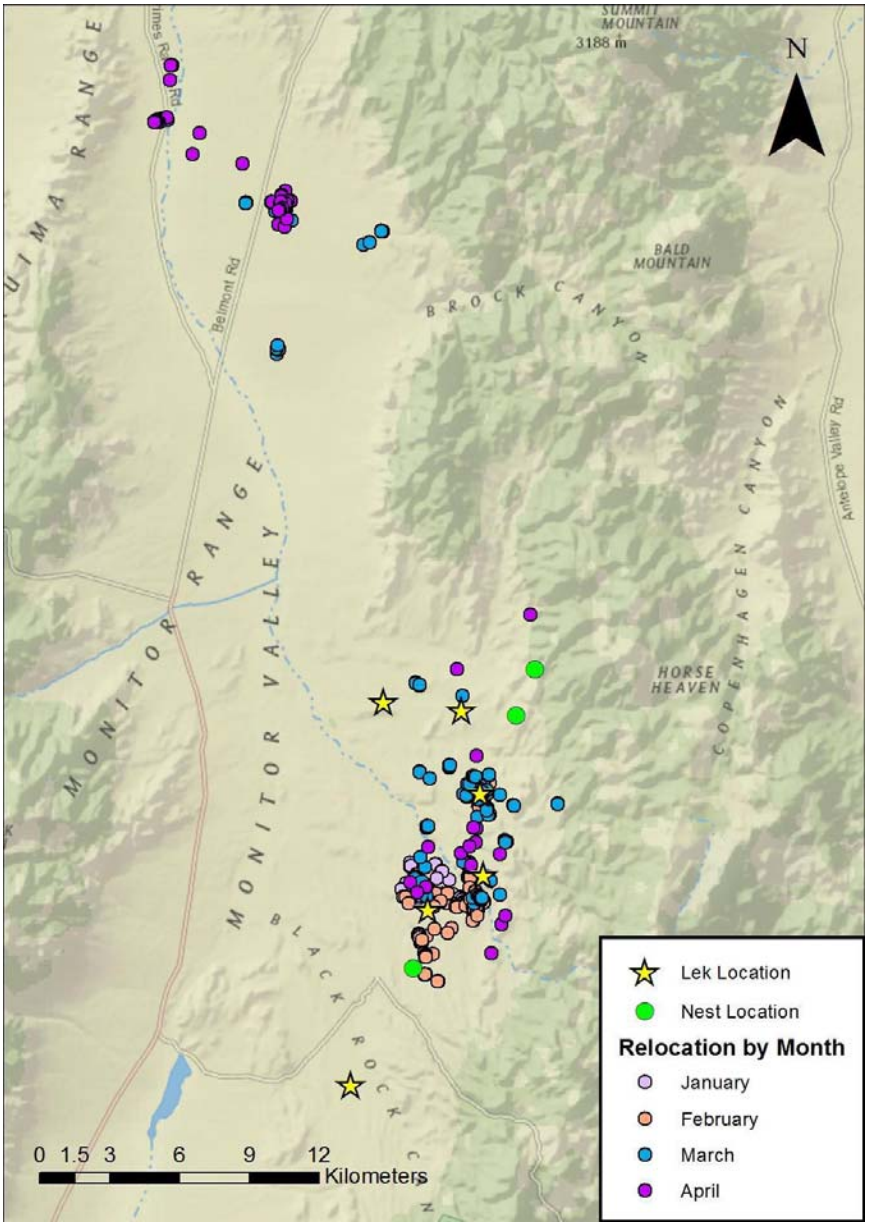


Figure 7. Leks (n = 6), nests (n = 3) and telemetry and GPS locations (n = 697) during January – April 2016, in Monitor Valley.

Eastern Region WMA Weed Control

This project is described in the section summarizing FY15 Duck Stamp projects. Upland Game Bird Stamp funds in the amount of $10,470 were used to supplement the Duck Stamp funding of this project.

Upland Game Bird Stamp Projects Funded in FY15

Name of Project	$ Spent in FY15
Columbian Sharp-tailed Grouse Re-Introduction	$24,863
Sage-Grouse Telemetry Project	$7,900
Ruffed Grouse and Mountain Quail Translocation	$7,000
Greater Sage-Grouse Research and Monitoring	$69,601
Southern Nevada Small Game Water Development	$40,620
Sage-Grouse Riparian Use Assessment	$8,660
Kirch Food Plots	$4,500
Toiyabe Sage Grouse PMU Habitat Enhancement	$45,000
Toiyabe Sage Grouse PMU Riparian Enhancement	$140
Northern Nevada Small Game Water Development	$13,090
Post-Fire Upland Game Habitat Restoration	$12,105
Upland Game Data Collection and Storage	$4,887
Sage and Columbian Sharp-tailed Grouse Workshop	$3,073
Eastern Region WMA Weed Control	$3,750
Total	**$245,189**

Upland Game Bird Stamp Projects Funded in FY16

Name of Project	$ Spent in FY16
Columbian Sharp-tailed Grouse Re-Introduction	$24,911
Greater Sage-Grouse Research and Monitoring	$59,788
Columbian Sharp-tailed Grouse Technical Support	$1,887
Ruffed Grouse and Mountain Quail Translocation	$9,088
Southern Nevada Small Game Water Development	$11,574
Bi-State Sage-Grouse Monitoring	$19,505
Key Pittman WMA Food Plots	$3,979
Buffalo Hills Medusahead Mapping	$7,669
Monitoring the Effects of Sage-Grouse Habitat Treatments in the Desatoya Mountains	$15,000
Post-Fire Upland Game Habitat Restoration	$13,931
Black Mountain Telephone Line Removal	$12,450
Determining the Effects of Raven Control on Sage-Grouse Vital Rates in the Virginia Mountains	$17,491
Estimating Sage-Grouse Vital Rates in Novel Habitats	$22,275
Kirch WMA Food Plots	$3,692
Eastern Region WMA Weed Control	$10,470
Total	**$233,710**

Upland Game Bird Stamp Program Financial Summary FY15-FY16	
Balance Forward to FY15	**$521,129.88**
FY15 Revenue	**$268,231.00**
FY15 Expenditures*	**$(275,919.06)**
Balance Forward to FY16	**$513,441.82**
FY16 Revenue	**$231,802.38**
FY16 Expenditures*	**$(244,361.02)**
Balance Forward to FY17	**$500,883.18**

* includes direct project costs, staff time, and indirect costs

STATUS REPORT OF NEVADA DEPARTMENT OF WILDLIFE'S MINING ASSESSMENT FEE PROGRAM REVENUE, PROGRAM EXPENDITURES AND PROJECTS UNDERTAKEN DURING FISCAL YEARS 2015 AND 2016

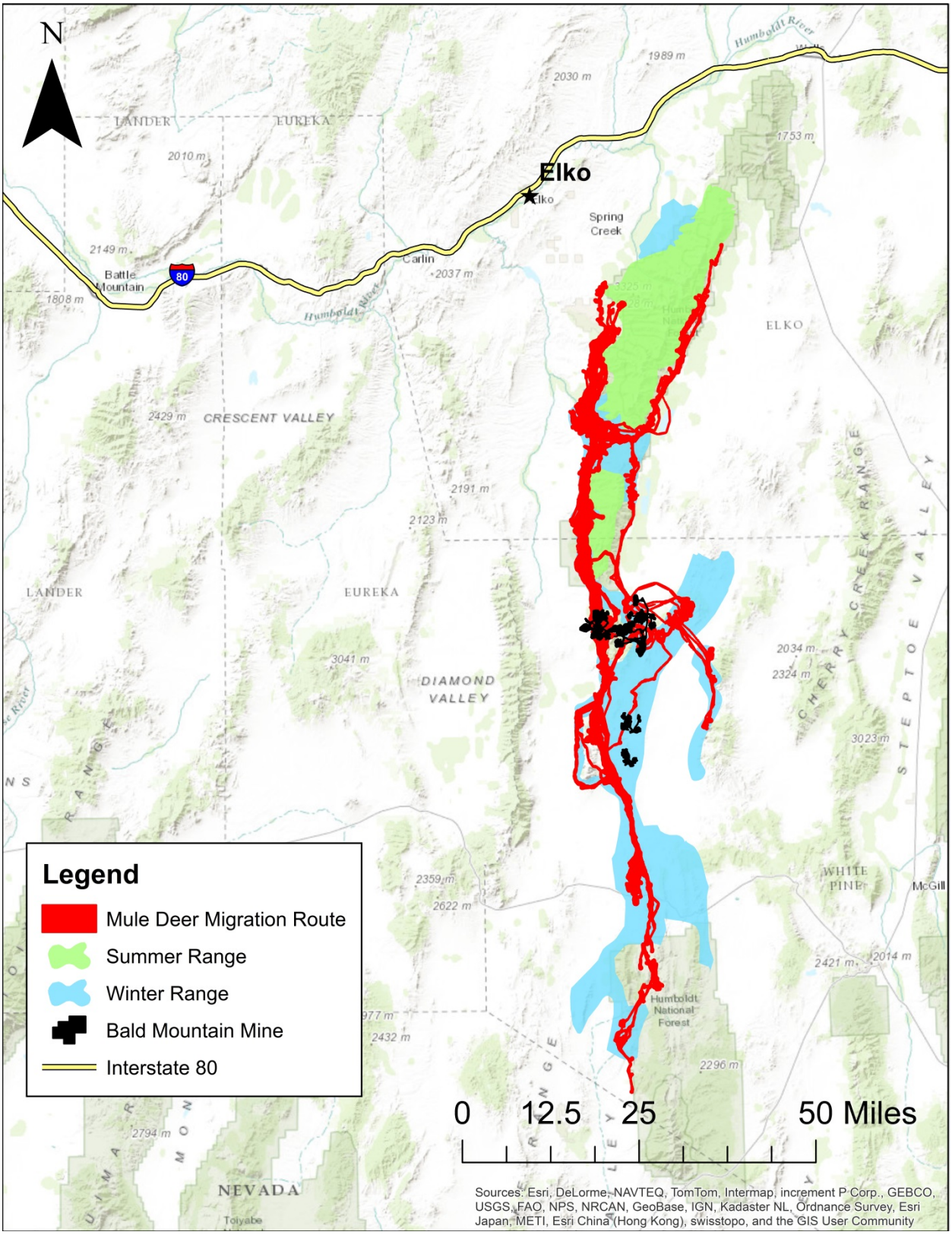
This section provides a summary of the projects funded by NDOW's Mining Assessment Fee account during State Fiscal Years 2015 and 2016. Compared to previous fiscal years, NDOW has greatly reduced expenditures from this account on mining-related projects that benefit wildlife. This has been a temporary reduction in expenditures of this type while NDOW prepared new regulations that will soon allow additional funding of such projects. The new regulations, Nevada Administrative Code Section 502.460 to 502.495, inclusive, take effect July 1, 2017 and will allow NDOW to implement new Industrial Artificial Pond Fees that will generate additional funds to pay for projects of this type in addition to the salaries of the NDOW biologists that permit and inspect industrial artificial ponds and conduct related compliance work. Under the current fee structure, NDOW did not have sufficient funds to cover both the salaries of the biologists and the costs of the projects that benefit wildlife. The new fee structure will allow NDOW to develop a self-sustaining Industrial Artificial Pond Program that does not need sportsmen's dollars to operate.

Highlights of Mining Assessment Fee Projects Funded in FY15

Mule Deer Telemetry and Database Project

The purpose of this project was to build upon an existing mule deer telemetry database related to mining developments in NDOW's Eastern Region. This work was conducted in cooperation with NDOW wildlife biologists, a professor and graduate student from the University of Nevada Reno, and private contractors specializing in animal movement analysis. The project helped NDOW and others determine the potential impacts to mule deer migration corridors from highly disturbed sites such as the Carlin Trend region to relatively undisturbed sites such as the eastern Pequop Mountains where the Long Canyon mine is being developed. Various sub-populations of migrating mule deer were selected for the focus of this radio-collaring effort and data analysis to capture a broad array of different migratory strategies inherent in different regions of northeast Nevada. Two peer-reviewed papers (Blum et al 2015, and Wolff et al 2016) and one technical report (Sawyer and Brittell 2014, WEST Inc.) have been published using the results from the data developed by this project thus far. These publications have been invaluable to NEPA planning and mining project design, as well as related mitigation requiring the monitoring of mule deer populations where large-scale mining operations have been developed. Research in the Pequop Mountains, south Ruby Mountains near Bald Mountain Mine, and the Carlin Trend region will be used as baseline information to monitor mule deer movement rates and use of migration corridors. This information will help protect crucial mule deer stop-over and winter range habitats. An example of a map using the telemetry data collected during this project is found on the next page.

Analysis of data occurred during the fall and winter of 2014 and the spring of 2015,



Map showing the Ruby Mountain deer herd migration route (red) in relation to the proposed expansion of the of the Bald Mountain Mine (black). Seasonal habitats are indicated by blue (winter range) and green (summer range) polygons.

although, the collection of GPS collar data began as early as 2012. Approximately 120 adult female mule deer were captured and collared in 3 study areas using the latest GPS radio technology. Migration rates and movement paths were delineated in each study area and analyses were conducted on rate of movement, stop-over use, and pre-development movement paths (Blum et al 2015, Sawyer and Brittell 2014). Monitoring of these migration corridors has shown mule deer have a high fidelity to specific paths and stop-over sites each year. Baseline movement rates and path analysis of mule deer will be used in current and future NEPA planning and compliance efforts to help maintain connectivity between crucial summer and winter habitats.

Abandoned Mine Lands Wildlife Surveys

NDOW used Mining Assessment Fee funds in FY15 to help conduct Abandoned Mine Land wildlife surveys. These surveys supported a joint program with the Nevada Division of Minerals (NDOM), BLM and the USFS. The wildlife surveys are conducted at abandoned mines being considered for closure throughout the state. The surveys are used to determine the wildlife value of these sites. These sites are being considered for closure because they are considered a public safety hazard. Data from the surveys conducted by NDOW personnel are used by the BLM, USFS and NDOM to determine if bat and bird compatible gates are to be used at the abandoned sites. On the other hand, if the surveys determine a site is not important to wildlife, then it is permanently closed without a gate.

Example of a bat and bird compatible gate at the entrance of an abandoned mine site

Sage-Grouse Telemetry Project

This project is described in the section summarizing projects funded with Upland Game Stamp Bird funds during FY15.

Highlights of Mining Assessment Fee Projects Funded in FY16

Rabies Prevention and Training Supplies

A small amount of Mining Assessment Fee funds were used to assemble handling and submission kits for bats or other mammals that were being submitted from the regions for rabies testing. These kits were placed in six NDOW offices and contained the items listed below.

- Solid containers to hold sick bats for euthanasia or dead bats for shipping
- Drugs to safely and humanely euthanize the bats

- Shipping coolers, ice packs, and packing materials to safely ship the bats or other mammals to the lab such that they would arrive in suitable condition for rabies testing
- Personal protective equipment for staff handling bats
- Protocols for the proper handling and submission of bats or other mammals for rabies testing

Mining Assessment Fee Projects Funded in FY15

Name of Project	$ Spent in FY15
Mule Deer Telemetry and Database Project	$6,850
Abandoned Mine Lands Wildlife Surveys	$9,305
Sage Grouse Telemetry Project	$7,925
Total	$24,080

Mining Assessment Fee Projects Funded in FY16

Name of Project	$ Spent in FY16
Rabies Prevention and Training Supplies	$191
Total	$191

Mining Assessment Fee Program Financial Summary FY15-FY16	
Balance Forward to FY15	**$61,161.87**
FY15 Revenue	**$465,920.00**
FY15 Expenditures*	**$(424,752.60)**
Balance Forward to FY16	**$102,329.27**
FY16 Revenue	**$287,897.25**
FY16 Expenditures*	**$(296,593.91)**
Balance Forward to FY17	**$93,632.61**

* includes direct project costs, staff time, and indirect costs