

# Nevada Department of Wildlife

## PREDATION MANAGEMENT PLAN FOR FY11 & FY10 REPORT



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# NEVADA PREDATION MANAGEMENT PLAN

Fiscal Year 2011

July 1, 2010 - June 30, 2011

The goal of the Nevada Predation Management Program is to initiate projects that have the greatest potential to produce the intended results based on the best available information and carried out in the most appropriate manner.

***NDOW maintains the philosophy that predation management is a valuable management tool. It is a tool to be applied by itself, or ideally in conjunction with other management techniques. The sole intention is to lessen the impacts of predation on identified populations that are being additively impacted by specific predators. As with any management strategy, predation management should be applied on a location specific, case-by-case basis, with clear goals, and based on the best available information. It should be applied in the proper intensity and at a focused scale. Equally important, after management is initiated, projects should be monitored to determine whether the desired results are achieved. The analysis of these projects will lead to better applications on future projects.***

The 2011 Predation Management Plan (PMP) provides a brief description of projects proposed for FY11 in the first section of the report entitled "***FY 10 Projects Proposed for FY11 Continuation.***" A synopsis and/or analysis of projects completed in FY 2010 in the second section of the report entitled "***Project Status Reports - FY 2010-11.***" Finally the last section of the report entitled "***Budget Detail by Project***" provides budget details in table format.

"All intrastate boundaries of wildlife damage management projects are to be taken as flexible boundaries, and any damage control personnel may operate freely in adjacent areas if, in their professional opinion, the animals determined to be causing damage in the target project area are located in such an adjacent area."

A history of the Projects through 2006 can be found in the NDOW document entitled: *A Program Overview - Nevada Predator Management Plan - A Report to the Nevada Board of Wildlife Commissioners' Wildlife Damage Management Committee (Predation Management Committee)*. This report was prepared by NDOW to describe the history of the Predator Management Program, including description of management applications, a documentation of deliverables, an accounting of budget commitments and analysis of project goal-completion. This document is available online at [www.ndow.org](http://www.ndow.org).



# ***FY 10 Projects Proposed for FY11 Continuation***

## **Project 6A: Protection of Desert Bighorn Sheep – Delamar Mountains**

**Project Inception and Current Status:** 2002, and approved through 2011.  
**FY2010 Expenditures by Wildlife Services to accomplish work:** \$17,369.08  
**Original Proposed Budget for FY11 (from est. FY10 costs):** \$17,422  
**Proposed Wildlife Services' Budget Request for FY11:** \$34,845  
**WDMC & NBWC recommended budget from August meeting:** \$90,000  
**Project Area:** Delamar Mountains, North & South Pahroc Ranges and Hiko Range.

**Predator Control Action:** USDA-APHIS-Wildlife Services (WS) removes mountain lions using dogs and other control tools such as a call box and snares. Coyotes will be targeted for removal using calling, shooting, leghold traps, aerial hunting and snares. Bobcats are targeted on a case-by-case basis using calling, shooting, leghold traps, aerial hunting and snares, to remove offending animals.

The WDMC recommended budget of \$90,000 to conduct mountain lion removal within the Delamar Mountains during FY2011 was based on the cost for a fulltime WS Wildlife Specialist to work the Delamar Mountains for targeted mountain lions, coyotes, and bobcats throughout the year.

## **Project 18: Washoe County Deer**

**Project Inception:** FY 2005  
**Original Proposed Budget for FY11 (from FY09costs):** \$103,945  
**Proposed Wildlife Services' Budget Request for FY11:** \$102,193.42  
**WDMC & NBWC recommended budget from August meeting:** \$93,564.00  
**Project Conclusion:** FY 2014 (10 year project)  
**Project Area:** Treatment Area: Granite Range, Washoe County.  
Control Area: Balance of northern Washoe County and the Sheldon NWR.  
**Target Predators:** Coyotes and Mountain Lions.  
**Control Period:** Year-round.  
**FY2010 Expenditures:** A total amount of \$85,185.55 was spent by Wildlife Services to perform control work as needed in FY10.

## **Project 20: Virginia Mountains BHS**

**Project Inception:** 2008  
**Original Proposed Budget for FY11:** \$5,807  
**Proposed Wildlife Services' Budget Request for FY11:** \$17,678.03  
**WDMC & NBWC recommended budget from August meeting:** \$17,678.03  
**Project Conclusion:** Not determined.  
**Project Area:** Washoe County, Unit 022.  
**Target Predator:** Mountain Lions



## **Project 21: E.NV Sage Grouse and WMA turkey, waterfowl, shorebirds**

**Project Inception:** 2008

**Project Conclusion:** Not determined.

**Original Proposed Budget for FY11: \$17,475**

**Proposed Wildlife Services' Budget Request for FY11: \$16,261**

**WDMC & NBWC recommended budget - August meeting: \$16,261 (\$2,000 of this for turkeys at Overton WMA as needed)**

**Project Area:** Twenty two leks in Elko and Lincoln Counties. (Leks added in 2011 and planned project expansion for 2011) and/or Overton Wildlife Management Area

**Target Predator:** Ravens

**Predator Control Action:** The USDA/APHIS Wildlife Services will remove ravens using DRC-1339.

**Control Period:** March-June.

Areas for Consideration but not limited to: Kings River Valley (031), Leonard Creek (032), N. Paradise Valley (051) and Overton WMA for turkeys.

**Projected Expenditures:** \$2,000 of the total above for Overton WMA as needed.

## **Project 22: Statewide Deer and Multi Species Enhancement Project**

**Project Inception:** FY 2010

**Project Conclusion:** Undetermined.

**Original Proposed Budget for FY11: \$145,187**

**Proposed Wildlife Services' Budget Request for FY11: \$145,187.50**

**WDMC & NBWC recommended budget from August meeting: \$145,187**

**Project Areas:** Based on current information in regards to big game species. Areas will be selected on several criteria. Those will include but not be limited to:

1. Mule deer herds exhibiting below average long-term postseason fawn: doe ratios, long-term spring fawn recruitment, and/or carrying capacity.
2. Areas where multi big game species exist.
3. Areas where long term habitat improvements are under way.
4. Areas where recent augmentations or reintroductions are planned.
5. Areas where other big game species are below carrying capacity, under long term averages for adult female: offspring ratios and areas where recruitment is below long-term averages.

**Areas for Consideration:** Specific winter and/or summer ranges in Areas 1, 3, 6, 7, 10, 11, 14, 17, 22, 23, and 24.

This proposal is for the perpetuation of Wildlife Service's aerial hunting program to control predatory animals for game species enhancement. Selective and timely control in designated areas based on aforementioned criteria will focus the effort in critical seasonal ranges. The funding will be applied to either existing, or proposed projects. The timing of the control work will be in accordance with the individual projects criteria, but should occur mainly on critical winter range and summer fawning areas. Wildlife



Services will have the ability to utilize the funding for either fixed wing or helicopter services. The proportion of use will be determined project by project.

Fixed wing costs are \$175/hour. Helicopter cost varies by type of aircraft and is estimated between \$600 to \$850/hour plus expenses.

### **Project 23: Mason Valley Pheasant**

**Project Inception: 2010**

**Original Proposed Budget for FY11: \$9,872**

**Proposed Wildlife Services' Budget Request for FY11: \$9,872.75**

**WDMC & NBWC recommended budget from August meeting: \$9,872.75**

**Project Description:**

In 2010 Mason Valley Wildlife Management Area initiated a ring-necked pheasant program incorporating two surrogate incubator boxes designed to raise pheasant chicks for a period of four weeks, at which time they will be released onto the WMA. The action is to augment the existing wild population of ring neck pheasants. A total of 260 birds will be released onto the area this year, with another 260 slated for next year. It is anticipated that a fairly high number of these birds will be lost due to predation.

**Target Predators:**

Coyotes, raccoons, skunks, badgers, and ravens.

### **Wildlife Services Field Specialist Positions**

**Original Proposed Budget for FY11: \$98,727**

**Proposed Wildlife Services' Budget Request for FY11: \$98,727.50**

**WDMC recommended budget from August meeting: \$98,727.50**

**Description:**

The position(s) allows the flexibility to adaptively manage the needs of multiple projects. Wildlife Services is authorized to expend up to \$85,000 to facilitate personnel needs to cover ground crew for aerial operations, ground trapping, raven control, and other duties as required.

### **Project 25: Area 16 Predator Prey Study, Utah State University.**

**Project Inception: FY 2010**

**Budget : \$25,000 contingent on match.** Match is available with the acceptance of the Federal Aid Grant Request for FY11. Selection of the graduate student was accomplished and some equipment has already been purchased.

**Project Initiation: FY 2011**

**Project Conclusion: FY 2015-2017**

**Projected Project Budget:** Approved for \$25,000 of Predator Fee dollars and contingent upon additional funding from other sources.

**WDMC & NBWC recommended budget from August meeting: \$25,000**

**Project Activities:** After the initial year when removal efforts are implemented, aerial hunting will be in conjunction with Project 22. The Wildlife Specialist assigned to the project will coordinate removal activities with USU.



**Project Criteria:** Area 16 is located mostly in Nye County in central Nevada. The fawn ratios in the fall and spring have been some of the lower numbers documented in the State in recent history. Spring fawn/ adult ratios are seldom over 30:100. Area 16 provides over 300 tags for deer hunters and also provides habitat for elk, bighorn sheep and antelope. The deer herds in Area 16 utilize altitudinal migration to a large extent rather than long migrations to adjacent mountain ranges for the most part. Unit 162 is also one of the most important source stocks for Nelson (Desert) bighorn sheep transplants.

## Impact of coyote removal on mule deer in Nevada

By

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### INTRODUCTION

Mule deer (*Odocoileus hemionus*) populations throughout the western United States have declined in recent decades (Fuller 1988, Ballard et al. 2001, Gill 2001). Factors identified as potential contributors to these declines include severe winters, drought, habitat loss or alteration, competition with elk (*Cervus elephus*), and fawn predation (deVos et al. 2003).

Coyotes (*Canis latrans*) are known predators of mule deer fawns, and there have been numerous observations of confrontations between mule deer and coyotes have been noted (Alldredge and Arthur 1980, Truett 1980, Wenger 1981, Lingle and Pellis 2002). To what extent coyote predation limits mule deer survival or recruitment remains unclear Connolly (1978) reviewed articles addressing the effects of predation on native ungulates. He found 31 studies that indicated predation was a limiting factor, and 27 that did not. He drew no definitive conclusion on the effects of predation on ungulates, although he suggested predation could have an important effect on ungulate numbers if coupled with inclement weather, disease, or habitat change.

Since Connolly's review, coyote populations have increased in many parts of the West following the ban on the use of most toxicants during the 1970s and the reduced hunting and trapping of coyotes after fur prices declined (Nowak 1978, Sterner and Shumake 1978, Hamlin 1997).. Concomitantly, there was a widespread decline in mule deer populations that motivated state wildlife agencies to re-examine factors limiting mule deer populations. Predator control activities in the United States are often conducted by United States Department of Agriculture's Wildlife Services (WS) primarily to protect livestock from predators, especially coyotes (Conover 2002). There are two different ways that coyote control could influence mule deer densities. The first is that coyote control increases the survival of fawns, causing ungulate populations to grow internally due to higher local recruitment (Teer et al. 1991; Ballard et al. 2001, 2003; Phillips and White 2003). The second is that ungulates try to avoid encounters with predators and will move to areas where such encounters are less common (Altendorf et al. 2001, Ripple and Beschta 2004, Harrington and Conover 2007).

Unfortunately, most studies examining the effects of predator control on native ungulates are conducted over short time periods and conducted in areas < 1,000 km<sup>2</sup> (Ballard et al. 2001, 2003). To date only 2 large-scale predator control studies have been conducted. Harrington and Conover (2007) conducted a study in Utah and



Colorado that encompassed an area >1,900 km<sup>2</sup>. They did not find a relationship between coyote removal and fawn:doe ratios, but found a correlation between the level of coyote removal and densities of pronghorn and mule deer. The other study was conducted by Hurley and Zager (2007) on mule deer in southeast Idaho. They found that coyote removal did not increase fawn or adult survival during winter, and that coyote removal did not increase the population growth rate. Nonetheless, coyote removal increased fawn survival under some conditions and had a positive, but weak, effect on fawn:doe ratios.

There is a clear need to determine why predator control has a positive benefit on mule deer recruitment and densities in some cases but not in others. I propose to study the effectiveness of predator control to enhance deer recruitment and densities over a seven-year period. I will conduct these studies at three different study areas allowing natural variation in weather and range conditions, as well as densities of deer, predator, and alternate prey. Additionally, coyotes will be removed in some areas but not others. One objectives of my research will be to determine if coyotes are decreasing fawn survival. I will also determine under what conditions coyote removal improves fawn survival and deer densities. Finally, results from this research have the potential to help managers decide if and when coyote removal should be used to increase mule deer populations.

## **Methods**

### ***Study area***

This study will take place in Management Area 16, specifically 162 or 163, where mule deer populations migrate short distances between their winter and summer range. Populations will be far enough apart that they are independent from each other. Ideally, I will study three deer populations that occupy linear mountain ranges. The area occupied by each population will be divided into two sections so that coyote populations can be controlled in one section but not the other.

This study will take place over seven years and three study areas providing a sample size of 21 site-years. A large sample size is needed to ascertain how variation in weather, range conditions, and alternate prey densities impact the effectiveness of predator removal on mule deer recruitment and densities. My aim is to be able to predict by the end of the study where and under what conditions predator removal has a beneficial effect on mule deer recruitment.

During the first year of the study, there will be no predator removal in any of the study areas so that I can collect pretreatment or base-line data. Starting in the second year, one section of study areas 1 and 2 will be subject to predator removal (Table 1). During the third year, predator control in study area 1 will be switched between the two sections; in study area 2, there will be no predator removal; and in study area 3, one section will receive predator control. This pattern of alternating predator removal and no removal will continue throughout the seven-year study (Table 1).

### ***Coyote removal***

USDA Wildlife Services (WS) will conduct coyote control in those study sections and during those years that are scheduled for predator removal (Table 1). Coyotes will be removed during winter using aerial gunning. Coyotes will also be removed using a combination of ground techniques (i.e., trapping, snaring, M-44s, and calling-and-



shooting) during spring and early summer while the fawns are still small enough to be vulnerable to coyotes.

Wildlife Services will provide me with the number of coyotes taken, the method of take, and either the coyote's carcass or the GPS coordinates of the carcass so that it can be retrieved. They will also provide me with 3 measurements of their control effort: hours spent aerial gunning, hours spent removing coyotes using ground techniques, and total hours worked (aerial hunting and ground techniques combined) for each section where coyotes were controlled.

I will ascertain for each coyote carcass its cause of death, prior injuries, disease, parasites, age, sex, size, mass, body condition, percent body fat, and reproductive status. I will collect and weight the contents of its digestive system and analyze the contents to determine the coyote's diet.

### ***Coyote surveys***

Coyote relative abundance will be estimated for all six section annually using coyote scat surveys (Knowlton, 1984). I will place a 1-km transect along a dirt road within the boundaries of each section. Transects will be walked once in each direction to avoid missing scats and all scats will be collected, counted and frozen. Numbers of scats counted will be standardized by the number of days between surveys and transect length. I will sample all section once every 14 days from June–August. Frozen scats will be dried, weighed, and any hair or feathers within them will be removed and identified to species. These scat data will be used to determine the percent occurrence of different prey species in scat samples.

In all sections, I will conduct an aerial survey of coyotes during the winter. In sections scheduled for predator removal, this count will be made during the same flights used to remove coyotes. Data from these counts in each section will be standardized into coyotes seen per hour searched and coyotes seen per km<sup>2</sup>. I will also record any coyotes observed in the study areas during our year-round activities.

Coyote scat and aerial surveys will provide a measure of relative coyote abundance and how it varies among sections within the same year and within the same section among years. To determine how these measures of relative coyote abundance compare to actual coyote densities, I plan to conduct a classical mark-recapture study in the two sections each year where coyotes are scheduled for removal (Table 1). I intend to capture live coyotes in the fall using neck snares with deer stops so that the coyotes are held but not strangled (Frey and Conover 2007), and leg-hold traps with tranquilizer tablets to sedate the coyote and a radio transmitter that send a single when the trap has snapped. Trapped coyotes will be aged, sexed, weighed, tattooed, and checked for injuries; blood also will be drawn. Before being released at the capture site, the coyote will be fitted with a radio-collar so that it can be detected at a distance. During the winter when coyotes are surveyed from the air, all coyotes that are observed or shot in the two removal sections will be checked with a radio receiver to determine if they are wearing a radio collar. All coyote carcasses also will be retrieved and checked for a radio collar or a tattoo to determine if the coyote had earlier been marked. I will determine the density of coyotes in the sections by comparing the number of coyotes that have been marked, the number of coyotes carcasses collected, and the proportion of carcasses that were marked.

In all sections, I will search for coyote hunters and ask them to report to me the number of coyotes they have shot or will shoot in any of my study areas, where the coyotes were shot, and how many had a radio collar. I will also ask them for the names and phone numbers of any other people they know that hunt coyotes in the area. I will



then contact these potential hunters. Additionally, I will place infra-red video-cameras by ungulate or livestock carcasses in the two removal sections and record the number of coyotes with and without radio collars that visit each carcass over the period of a week.

Radio-collared coyotes will be tracked weekly throughout the year and their position will be determined through triangulation. These data will be used to determine the use of space by coyotes and their home range size.

### ***Ungulate surveys***

Ungulate counts may be conducted using the methods of Connolly (1981), Lopez et al. (2004), and Harrington and Conover (2007). Each section surveyed once every 2 weeks from June until October. One transect placed in the middle of each section along roads located in areas where ungulates were known to inhabit during the summer and fall. Transect length varies from 15 to 30 km depending upon availability of roads. Once set, the location of transects are not changed, and all are surveyed by the same person to avoid inter-observer biases. Surveys are conducted using a motor vehicle traveling 25 km/hr during the first two hours after sunrise or the last two hours prior to sunset. All ungulates observed during the surveys are identified to species, sex, and age (fawn, adult). Surrounding vegetation height, the ungulate's perpendicular distance to the transect and group size are recorded for all observations. Fawn survival is estimated for each section by calculating fawn:doe ratios from survey data (Harrington and Conover 2007). Ungulate abundance indices for each site is calculated as the number of ungulates seen per km of transect. Other observations recorded for each ungulate group sighted include the number of ungulate yearling males, time of day, odometer reading, habitat type, and side of road. Temperature, wind speed, amount of cloud cover, and weather is periodically recorded throughout the survey.

The program DISTANCE is used to model deer detection functions and to estimate mule deer densities (Thomas et al. 2006). Information provided in Buckland et al. (2001), Buckland et al. (2004), and Thomas et al. (2006) is used to determine appropriate detection functions during modeling and in the model selection process.

During the deer hunting season (bow, rifle, or muzzle-loader), hunters are contacted by leaving a questionnaire on their parked vehicles, waiting for their return, or visiting them in their camps. Hunter success, number of hours spent hunting in each section, and the numbers of bucks, does, or coyotes they observed is recorded. All dead deer shot by hunters and all deer carcasses found are sexed; weighed; aged; and checked for condition (body fat), any obvious wounds, diseases or parasites. Blood is also drawn from each deer.

### ***Alternate prey surveys***

Hair samples from coyote scat and the stomach contents of coyote carcasses obtained throughout the year are analyzed to determine their diet. Survey all foods that coyotes consume regularly to track their abundance over time. Elsewhere, lagomorphs are the primary prey of coyotes, it is suspect that will also be true for these study sites. Conduct lagomorphs spotlight surveys using the methods of Calley and Morley (2002). by driving at 10-20 km/hour along the same transects used for deer surveys. Lagomorph surveys are conducted two hours after sunset until two hours before sunrise with five nights of the new moon because lagomorphs are more active on dark nights than when the moon is full (Kline 1965, Fafarman and Whyte 1979).



. All lagomorphs are recorded including time, odometer reading, GPS location, and perpendicular distance from the transect. These data are used to determine abundance indices (lagomorph/km of transect) for each section.

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# Project Status Reports - FY 10

## Project 6A: Protection of Desert Bighorn Sheep – Delamar Mountains

By Kevin Lansford, Mike Cox and Mike Scott

**Project Inception and Current Status:** 2002, and approved through 2011.

**Project Area:** Delamar Mountains, North & South Pahroc Ranges and Hiko Range.

**Target Predators:** Coyotes, bobcats and Mountain Lions.

**Control Period:** Year-round.

**Predator Control Action:** USDA-APHIS-Wildlife Services (WS) hunts mountain lions using dogs and other control tools such as a call box and snares. Bobcats and coyotes are targeted on a case-by-case basis using calling, shooting, leghold traps, aerial hunting and snares, to remove offending animals.

**Control Period:** September – March for lions, as needed for bobcats and coyotes.

**FY2010 Summary of Control Activities:** In FY 2010 NDOW contacted Wildlife Services on at least four separate occasions concerning mortality signals on bighorn sheep in the Delamar Mountains. Mortality signals are emitted by radio collars placed on bighorn sheep. When the collar does not move for a set amount of time it sends out a mortality signal indicating the sheep died or possibly lost the collar for various reasons. One adult ewe bobcat kill was confirmed. An adult male bobcat was trapped and removed near the kill site. Three other mortality signals were investigated by Wildlife Services personnel during FY 2010. One was a confirmed lion kill and one adult male lion was removed associated with this kill. The other two bighorn sheep died of natural causes. Two other lions were also removed by Wildlife Services for the protection of bighorn sheep. Four coyotes were removed near the location that two adult ewe bighorn sheep were confirmed killed by coyotes the previous fiscal year. Three coyotes were removed with the use of a helicopter and one coyote was caught in a leghold trap placed for the above mentioned bobcat.

**FY2009 Summary of Control Activities:** In FY 2009 an additional 108 bighorn sheep were augmented into the Delamar Mountains (75) and Meadow Valley Mountains (33). Shortly after the release, mortality signals on two GPS collars were received. Initial investigation of the carcasses indicated the predation was by coyotes. This adds to the list of mountain lions and bobcats as confirmed bighorn sheep predators in the Delamar Range. Aerial hunting of coyotes in the immediate vicinity was accomplished and resulted in the removal of eight coyotes from the area. Wildlife Service's contracted a helicopter to return to the area in May. Eight more coyotes (16 total) were removed from in and around bighorn sheep herds and the vicinity of the original predation.

Subsequent to the coyote predation, two bighorn sheep mortalities were documented as caused by mountain lion predation. In FY2008 the lion specialist assigned to the project had trailed one of the lions but never was able to capture it. In FY 2009, the area biologist placed trail cameras at several waterholes and caught two lions on film utilizing the area. The Wildlife Services Lion Specialist began trailing the cats again in



December FY 2009 and captured them, one on 12-16 and the other on 12-22. One female and one male were removed with estimated ages of 7.5 and 4.5 years old, respectively. N FY 2010, three more lion were seen on trail cameras. The Wildlife Services Lion Specialist began trailing the cats again in September 2010.

**FY2008 Summary of Measured Outcomes:** There are indications that the Delamar Mountains predation management project may help facilitate establishment of a stable bighorn population as suggested by the following table of survey results:

<i>Year</i>	<i>Rams</i>	<i>Ewes</i>	<i>Lambs</i>	<i>Total</i>
2001	16	17	5	38
2002	3	15	3	21
2003	7	12	2	21
2004	5	15	5	25
2005	4	23	5	32
2006	6	7	1	14
2007	12	25	9	46
2008	6	22	4	32
2009	7	37	10	54

**Conclusion:**

Eight lions, three bobcats and 20 coyotes have been removed as of June 30, 2010. An initial large tom was removed in 2002, one lion in 2006, three in 2008, and the three lions removed in 2010 were all associated with bighorn sheep mortalities. It was surmised that bobcat predation has had a larger impact than originally thought. This was founded on the fact that at least two previous kills were identified as bobcat predation. This can also be said of coyotes after the predation of two bighorn sheep by coyotes after the FY 2009 augmentation.

A large portion of the Delamar Mountains was declared wilderness in the Lincoln County Lands Act of 2004 and is now Designated Wilderness Area. Access for trappers was severely reduced, which may result in higher bobcat and coyote densities than adjacent areas where trappers have good access. The project was designed to mitigate bighorn losses to predation until such time that the herd has reached a threshold level where such losses are overcome by recruitment.

Most known lion predation incidents occurred from October through March. The project provided important information concerning lion use patterns, season of use, general densities, as well as pinpointing windows when lions and bighorn sheep use areas overlap. A better understanding of how to more efficiently and effectively allocate personnel and resources facilitates a more surgical approach to lion removal.

Bobcats and coyotes are known predators of large ungulates. Recently augmented or introduced bighorns are also known to be more vulnerable to predation. This was confirmed since both the bobcat and coyote predation incidents occurred on recently augmented and collared sheep within weeks of their release.

**FY2011 Projected Expenditures:** WS-Nevada proposed a budget of \$90,000 to conduct mountain lion removal within the Delamar Mountains during FY2011. This



increased budget was for a fulltime year-round WS Wildlife Specialist to work the Delamar Mountains for targeted mountain lions, coyotes, and bobcats.

## Project 18: Washoe County Deer

BY TONY WASLEY, MIKE DOBEL AND CHRIS HAMPSON

**Project Inception:** FY 2005

**Project Conclusion:** FY 2009 (5-year project extended-Commission Recommendation)

**Project Area:** Treatment: Granite Range-Washoe County-Big Game Unit 014.

Control: Balance of northern Washoe County and the Sheldon NWR-Big Game Units 011-013, 015, and 033.

**Target Predators:** Coyotes and Mountain Lions.

**Control Period:** Year-round.

**Deer Capture and Monitoring:** In December 2004, a total of 24 mule deer were captured and fitted with ear-tag transmitters. Transmitters were attached to 8 juveniles (4 males and 4 females) and 16 adults (10 females and 6 males). All but two of the 24 deer were also fitted with plastic All-Flex numbered ear-tags to help in identifying animals from the ground.

The capture and monitoring effort was initiated in an effort to better understand mule deer seasonal use patterns and to investigate survival of marked mule deer. Telemetry follow-up was conducted from both the ground (vehicle) and the air (NDOW airplane). The transmitter's battery life was found to be around 18 months with a few lasting up to two years. All transmitters stopped functioning at the end of the two year period.

The telemetry information gained from this portion of the study helped to confirm and document mule deer movement patterns within the Granite Range. No major deer movements away from the Granite Range were noted. As expected, mule deer within the Granite Range simply dropped in elevation during the winter and were generally located on known winter ranges. During extreme winter events some deer moved further to the east and into the foothills east of Leadville Canyon and to lower elevation alluvial fans south of Little High Rock Canyon. During the summer months, most deer moved to the highest elevations on the southern half of the range or were located on upper elevation peaks or ridges.

- None of the 24 marked mule deer were known to have died during the two-year monitoring period. However, two adult males were later harvested by hunters, one during the 2006 rifle season and the other during the 2008 season. Three of the transmitters malfunctioned and were observed on "live deer" while emitting a mortality signal. Two other transmitters simply fell off of the deer and were found with deer tracks coming and going from the transmitter left lying on the ground. One other transmitter quit working entirely in April of 2005. All other deer were known to be alive and well at the end of the monitoring period.

**FY2011 Projected Expenditures:** WS-Nevada had proposed a necessary budget of \$102,193.42 to conduct coyote and mountain lion removal within the treatment area



during FY2011. NDOW will continue to monitor the Granite Range mule deer population by conducting both post-season and spring herd composition surveys.

**FY2010 Summary of Control Activities:** According to Wildlife Services and NDOW records, as of November 2010, a total of 812 coyotes and 31 mountain lions have been removed since project inception.

### Project 18 Predator Removal by Year

	2004	2005	2006	2007	2008	2009	2010	Total
Lions	0	4	0	10	5	5	7	31
Coyotes	66	119	230	149	84	105	59	812

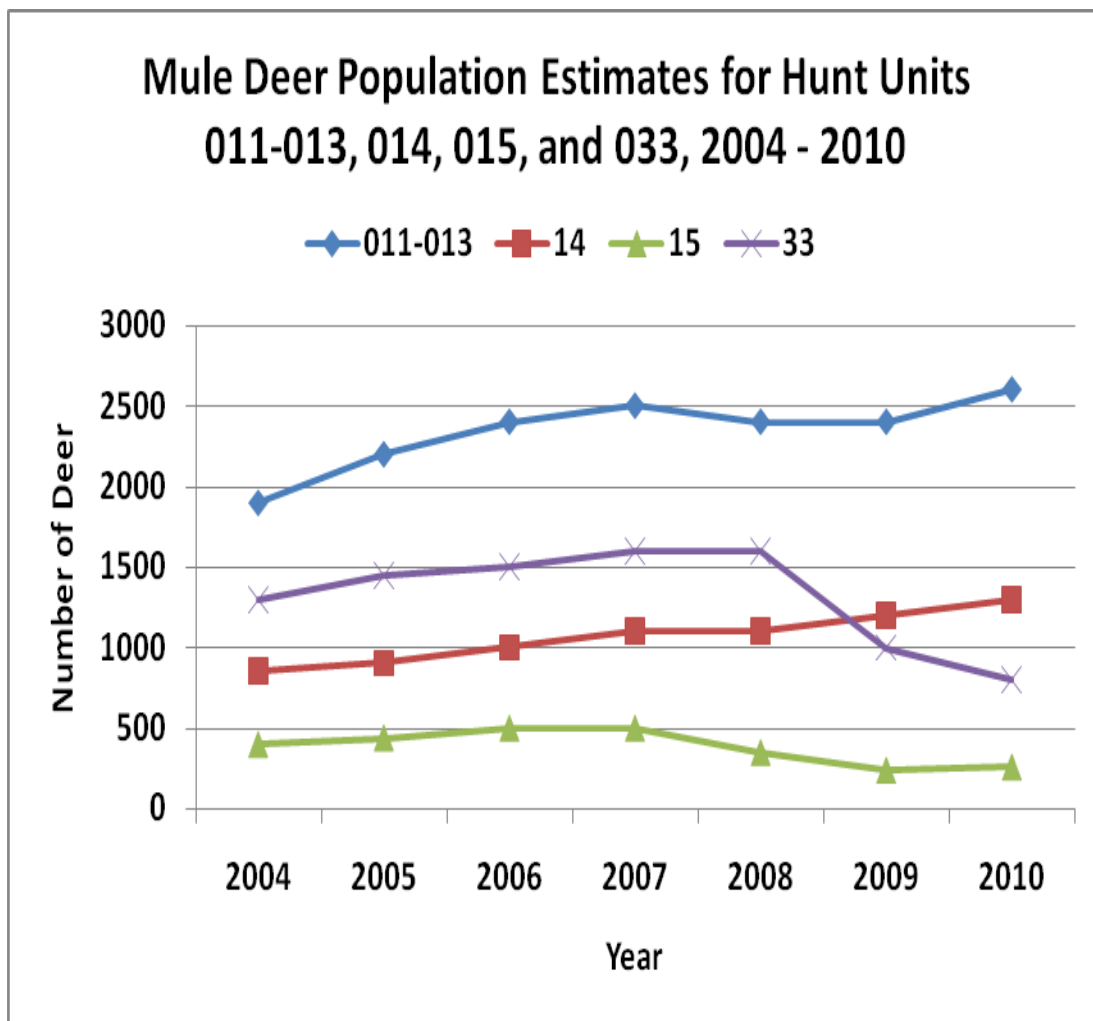
### Project 18 Expenditures by Year

FY05	FY06	FY07	FY08	FY09	FY10	Total Expended Thru FY 2010	FY11	Total
20,511	25,966	31,946	95,525	103,945	108,674	386,567	102,193	488,760

**FY2010 Summary of Measured Outcomes:** Different measures of success can be used to evaluate the effectiveness of a project. Since this project's primary objective has been to provide a benefit to mule deer via decreased predation by mountain lions and coyotes, indices of mule deer population, mule deer production, hunting opportunity, hunting success, and quality of animals harvested were considered and compared between the area in which predator management is occurring and adjacent areas with relatively little or no removal activities occurring.



Figure 1. Mule Deer Population Estimates for Hunt Units 011-013, 014, 015, and 033, 2004 – 2010.



Mule deer population estimates have shown decreases in two of the four areas and increases in the remaining two. Decreases were observed in units 015 and 033 while increases were observed in 011-013 and 014.

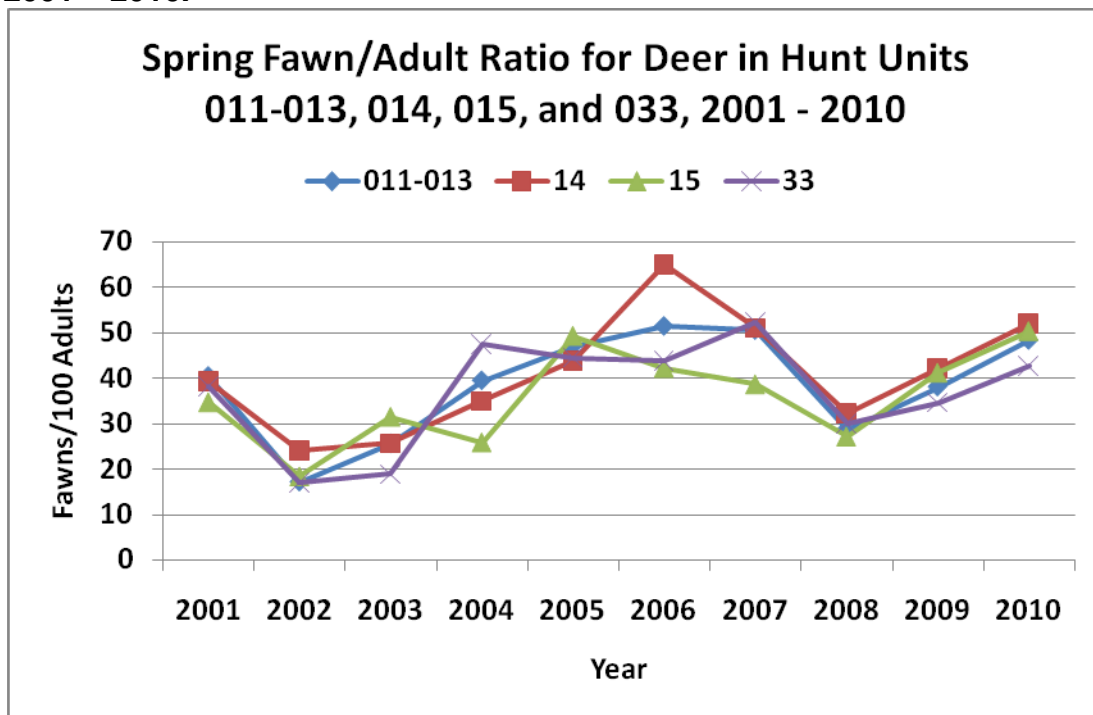
Unit 015 represents critical winter range for the Lassen Interstate mule deer herd that resides in California hunt unit X5B. Nevada's apportionment of the quota for this deer population is based upon the percentage of the population that is expected or estimated to winter in Nevada in any given year. In recent years, the mild winters and the lack of any significant snow accumulations have resulted in fewer deer wintering in Nevada. For this reason, the population estimate for the Nevada portion was lowered in order to better reflect the number of deer available to Nevada's hunters. However, significant snowfall and moisture during the winter and spring of 2009-10, forced many more mule deer to move to the Nevada side of the border. The increase in deer numbers resulted in an improvement in 2009 hunter success rates for Nevada hunt unit 015 by more than 30% and a 10% decrease in California's X5B. Additionally, NDOW biologists classified the highest number of deer (622 animals) in more than a decade and the highest fawn ratio ever observed, during the spring 2010 survey.



The population decrease in 033 is likely a result of catastrophic wildfire destroying ~50-60% of the available mule deer summer range since 1998 and prolonged drought with 9 of the last 12 years below to well-below average for precipitation and snowfall. As a result of the dry conditions, major water sources such as Big Springs Reservoir, Swan Lake, and lakebeds across Rock Springs Table have dried up completely during the past few years.

Population increases in 011-013 (37%) and 014 (53%) could be attributable to a number of factors including; predator control, wild horse gathers, mild winters, wet springs, and late summer moisture. Predator control has publicly received credit for much of the 53% increase in Unit 014 (850 deer to 1300) and may well have facilitated at least some of the growth. It should be noted that well over half of that population increase (850-1100) occurred by the spring of 2007 before any appreciable lion removal occurred. Only 4 of the 31 lions were removed before preparation of the 2007 deer population estimate. Additionally, since the same pattern of deer population increases occurred in 011-013 and 033 from 2004 to 2008 in the absence of predator control, it strongly suggests deer population increases in northwest Nevada were likely the result of a larger landscape scale phenomenon such as weather.

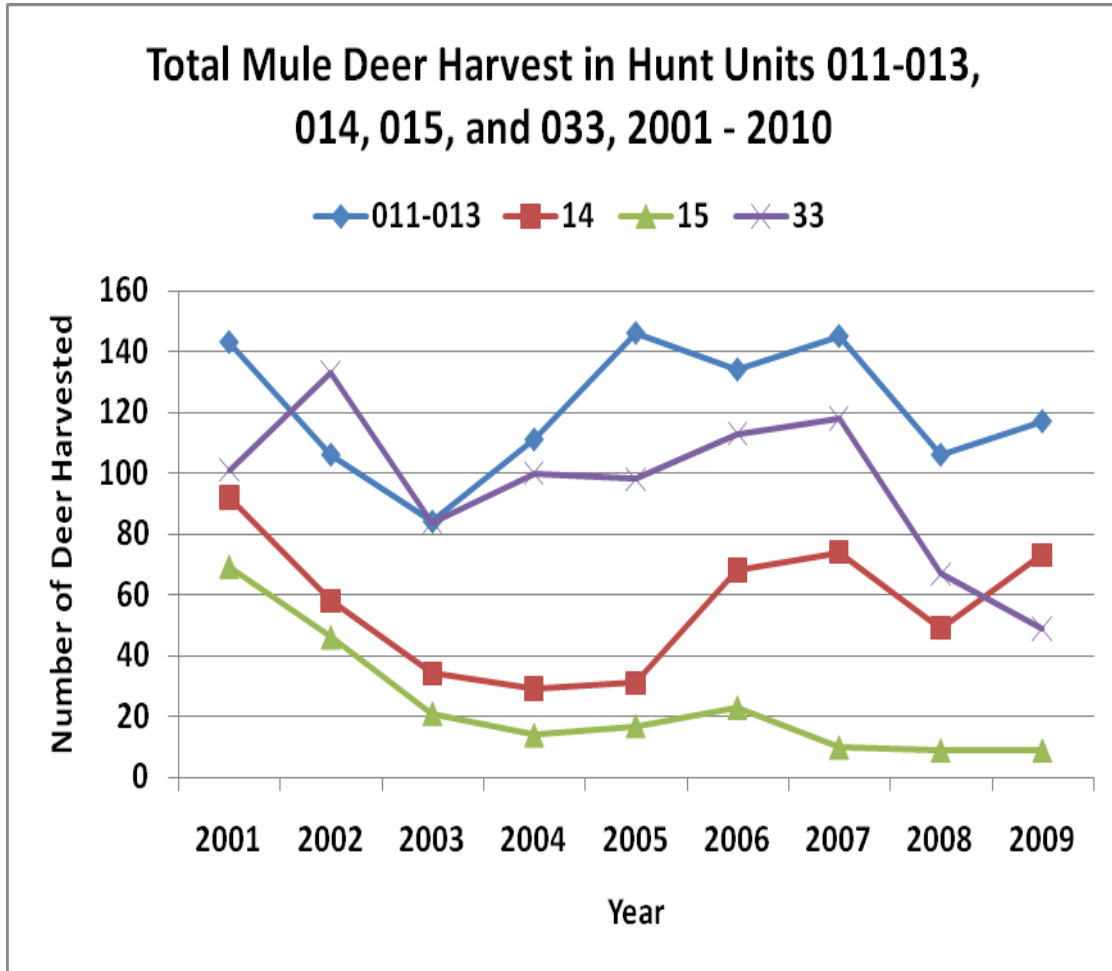
**Figure 2. Spring Fawn/Adult Ratios for Deer in Hunt Units 011-013, 014, 015, and 033, 2001 – 2010.**



Spring Fawn/Adult ratios have varied widely. In only one of 6 years since the inception of the project, was the spring fawn/adult ratio noticeably higher in 014 than the other units. This occurred after only 4 lions and 185 coyotes had been removed and has not occurred since with significantly more predator removal having occurred subsequent to that time. As **Figure 2** demonstrates, the variation between years is much greater for all units than variation between units within years. This suggests that production and recruitment are most often driven by landscape scale phenomenon such as climate.



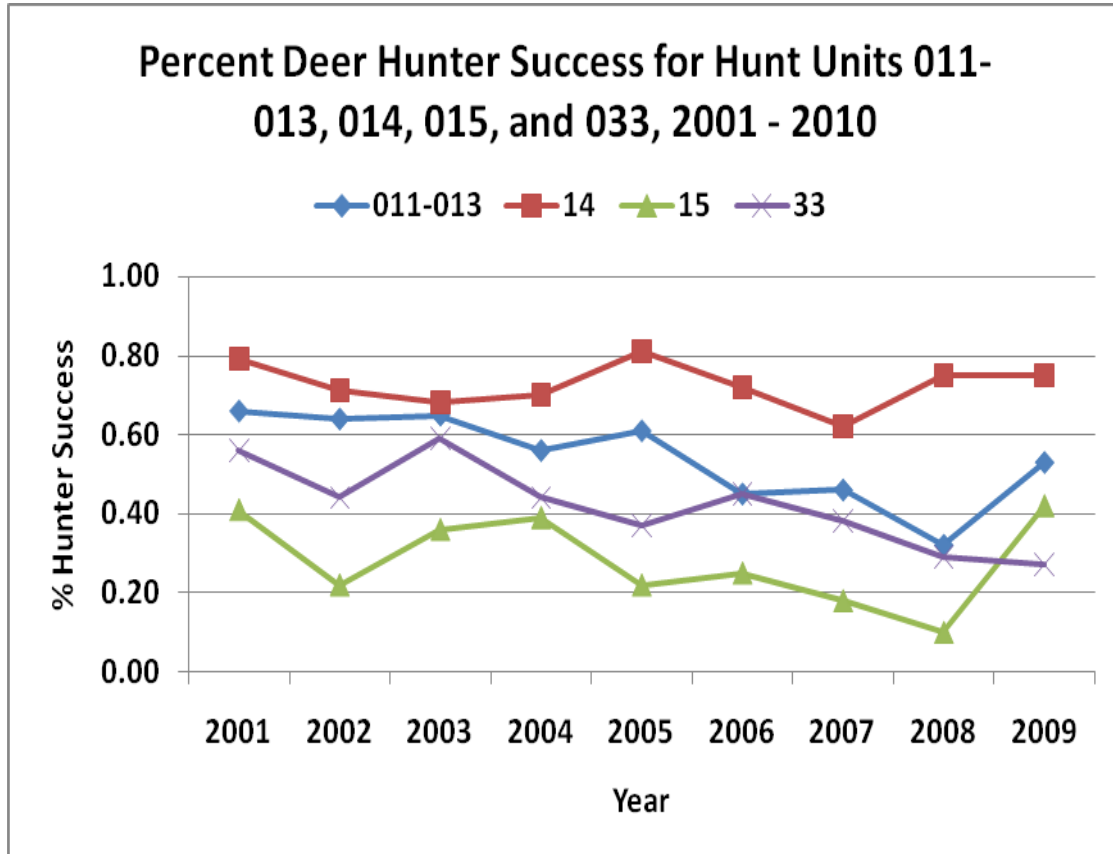
Figure 3. Total Mule Deer Harvest in Hunt Units 011-013, 014, 015, and 033, 2001 – 2010.



Total harvest for all areas has maintained a similar pattern with increases experienced in 2005, 2006, and 2007. Harvest in all of them declined sharply in 2008 except for 015 which had already declined in 2007. While both 011-013 and 014 rebounded in 2009, harvest in 033 reflects the direction of the deer population which declined each of the past two years. Harvest in Unit 015 has been relatively stable since 2007. The pattern observed in 014 does not appear unique to 014 or significantly different from adjacent areas.



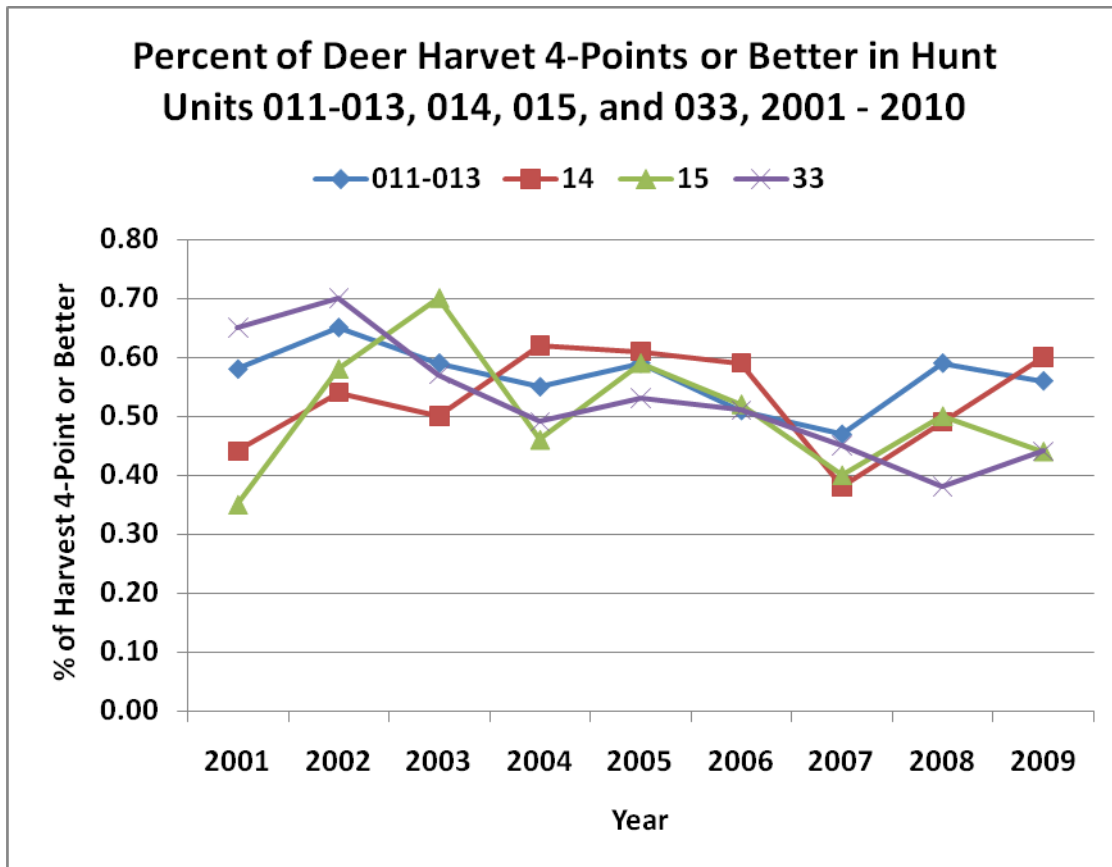
Figure 4. Percent Deer Hunter Success for Hunt Units 011-013, 014, 015, and 033, 2001 – 2010.



Percent deer hunter success reveals some interesting between unit patterns. In each of the past 10 years the relative order from highest hunter success to lowest hunter success, excluding one year, has remained intact. Unit groups 014 and 011-013 have been 1 and 2 respectively while 033 and 015 were 3<sup>rd</sup> and 4<sup>th</sup>. Project 18 began in late 2004 and despite a slight increase in hunter success in 2005, dropped slightly in each of the two years that followed. However, the decline was consistent with all other units in the area and was likely a by-product of difficult hunting conditions. Hunter success rate data seem largely unremarkable as it relates to project 18.



**Figure 5. Percent of Deer Harvest 4-Points or better in Hunt Units 011-013, 014, 015, and 033, 2001 – 2010.**



Although percent of 4-point or better in the harvest is sometimes used as a measure of quality hunting, it's more often a measure of proportional availability. For example, **Figure 2** demonstrates that most areas in northeast Nevada had high fawn ratios in 2006. Consequently, **Figure 5** shows the same areas with a low percentage of 4-point or better bucks in the harvest in 2007. Additionally, there does not appear to be any relationship between the percentage of bucks 4-points and better in the harvest and predator management activities.

**Conclusion:**

Project 18 has been ongoing since late 2004. Since that time, the population in unit 014 has increased by 53%. However, 30% of that increase occurred prior to any appreciable predator removal, and, the adjacent units, 011-013, experienced a 37% population increase over that same time frame in the absence of predator management. Population decreases in unit 015 are largely an artifact of mild winters in California and an absence of migratory deer from California making the trek to Nevada (**see Figure 2**). While the decrease in 033 is likely a result of catastrophic wildfire destroying ~50-60% of the available mule deer summer range since 1998 and prolonged drought, as 9 of the last 12 years have been well below average precipitation in that region.



Fawn ratios, hunter success, total harvest, and 4-point or better don't provide evidence or insight to any population level benefits of project 18 that might translate to increased opportunity or improved buck quality.

With the assistance of UNR a series of statistical analyses were performed on data from project 18. Population estimates, fall fawn ratios, spring fawn ratios, hunter success, total harvest, and percent 4-point or better were all independently regressed against both lion harvest and coyote harvest. The regressions performed resulted in zero significant correlations. Additionally, population trends of mule deer were tested for statistically significant differences between the predator management area and other adjacent areas. No statistically significant difference existed between 014 and either 033 or 011-013. However, the population trend in 014 was statistically different from that observed in 015.

Some attention has been given to the potential effects of predator control on the California bighorn sheep residing in Unit 014. The bighorn sheep population in the area increased 200% since the inception of the project (2004). Some feel this is indicative of benefits of predator removal to bighorn sheep. Although removal of lions and coyotes may be facilitating population growth and expansion of bighorn sheep, it is important to consider several other factors that may have also influenced bighorn sheep populations.

At the inception of the predator management project in Unit 014 the sheep population was already very low after a suspected bighorn sheep die-off (2001) where up to 70% of the sheep may have perished. Bighorn sheep hunting seasons were closed from 2001-2004 in area 014. An augmentation was accomplished in 2004 to help offset the losses from the die-off. Eighteen bighorn sheep were transplanted into a more northern part of 014 in order to start a new sub-population at Negro Creek. This newly established population at Negro Creek exhibited a rapid growth rate frequently observed in new sheep populations. Unit 014 went from the smallest California bighorn population in the state at 40 animals to only the fourth smallest California bighorn sheep population of 120 animals from 2004 to 2010. In 2010, 9 bighorn sheep were trapped from Unit 014 and transplanted to the Jackson Mountains in Humboldt County. So the actual increase over the 6-year period was 89 bighorn and represents a 223% increase. This population increase was facilitated by natural recovery and predator management, but augmentations were also part of the formula for success.

For comparative purposes, Unit 012 bighorn population estimates went from 160 California bighorn sheep in 2005 to 270 in 2010 for a 69% increase of 120 animals in just 5 years. Furthermore, 20 bighorn were removed and transplanted to Idaho from Unit 012 in 2004 and 6 more were removed and transplanted to the Jackson Mountains in 2010. If those additional 26 bighorn are added to the total, then the population would have increased by 146 animals or 73%, without specific predator management actions being employed. In actuality, there would have been even more than the 26 bighorns added to the population. This is because by keeping those ewes in the herd, their offspring from 2004 to 2010 would have added even more animals to the population demonstrating the ability for natural recovery and recruitment of bighorn sheep.

The bighorn sheep hunting season in 014 was reopened in 2005 with one tag. Since 2005 every sheep that has been harvested in this unit has been harvested from the new



sub-population at Negro Creek. These sheep are from a different source stock than the southern Granite populations and not only are much more easily accessed in Negro Creek, but the sheep from this particular source stock are larger horned animals. Although predator removal certainly provide benefits to bighorn sheep populations, these other factors are also important to consider when explaining a 200% population level increase and the improved trophy quality that has been reported.

**Recommendation for FY2011:** Continue with Project 18 into FY11.

## Project 20: Virginia Mountains BHS

BY KEVIN LANSFORD AND JACK SPENCER

**Project Inception:** 2008

**Project Conclusion:** Not determined.

**Project Area:** Washoe County, Unit 022.

**Target Predator:** Mountain Lions

**FY2010 Expenditures:** A total amount of \$4,707.10 was spent by Wildlife Services to perform control work as needed in FY10.

**Summary of Control Activities:** Wildlife Services' Lion Specialist initiated control activities in January 2008. Almost immediately a female with 3 juveniles was located and removed within the same range the sheep were occupying. It is well known and documented that female lions with kittens are the most prolific killers. Addressing that specific situation was important. In February of 2008 another lion was removed within the sheep's range, again a female. In January 2010, a large male mountain lion was removed in close proximity to where several bighorn sheep were residing. In October 2010, a hunter harvested a two-year-old female lion from the west side of Tule Ridge in Unit 022.

**Recommendation:** The recommendation is to continue to target mountain lions preying on populations of recently introduced, augmented, underachieving herds, or herds where lion predation is identified as excessive on bighorn sheep. Currently there has only been enough funding to periodically use a Lion Specialist with hounds to occasionally visit the Virginia Mountains. Wildlife Services recommended that trail snares and call boxes be used to better offer 24 hour protection to address mountain lion immigration that can occur at any time.

**FY2011 Projected Expenditures:** WS-Nevada proposed a budget of \$17,678.03 to conduct mountain lion removal within the treatment area during FY2011.



## **Project 21: E.NV Sage Grouse & WMA turkey, waterfowl, shorebirds**

By Kevin Lansford and Joe Bennett

**Project Inception:** 2008

**Project Conclusion:** Not determined.

**Project Area:** Twenty-two leks in Elko and Lincoln Counties and Wildlife Management Areas (WMA's) in Clark (Overton), Nye (Kirch) and White Pine Counties (Steptoe).

**Target Predator:** Ravens

**Predator Control Action:** The USDA/APHIS Wildlife Services will remove ravens using DRC-1339.

**Control Period:** March-June.

**Desired Results:** Nest success of sage grouse, turkeys, waterfowl and shorebirds should increase from the suppression of ravens.

FY 2010 Expenditures: \$14,297.83

Ravens are known predators of sage grouse nests and chicks. Ravens are also known predators of waterfowl and shore bird nests and chicks. USDA-APHIS-Wildlife Services was requested by NDOW to help reduce impacts caused by raven predation in designated areas utilizing DRC-1339 egg baits.

During FY10 some pre-treatment raven counts were conducted and recorded within the vicinity of targeted leks. Due to weather conditions and logistics, not all leks had pre-treatment raven counts completed. Wildlife Services observations indicated that ravens tend to move into the treatment areas later in the season. This may have accounted for the low pre-treatment counts and the fluctuation in raven numbers.

A total of 4,146 treated eggs were placed for the protection of sage grouse, waterfowl and shorebirds this past season. Wildlife Services observations indicated a dramatic reduction in raven concentrations in and around the treatment areas. Wildlife Services observations indicated it may be possible to achieve a 90% or higher reduction in localized raven numbers.

NDOW project 21a began on March 2, 2010 with raven counts and then control activities started on March 3, 2010. For the third year, NDOW biologists pre-selected 22 sage grouse leks and lek complexes based on the number of sage grouse, the number of ravens observed, and leks associated with low production. All 22 leks were located in Elko and Lincoln Counties. Nine leks were in Elko County and 13 were in Lincoln County. Two new lek complexes were selected by NDOW biologists in Elko County and were treated several times. Two leks were also treated late in the nesting season in Lander County at the request of NDOW bringing the total number of leks treated to 24 during 2010. The two leks treated in Lander County were Ackerman and Dry Creek. Leks treated in Lincoln County included Whittemore, Little Spring Valley,



Fogliani, Eight Mile, Benchland, Tub Peak Hills 1, Tub Peak Hills 2, Tub Peak Hills 3, North Hamlin Well, Rosencrans Knolls 1, Rosencrans Knolls 2, Gardner Ranch, and Patterson Pass. Leks treated in Elko County included the Harris Complex, Barry's Complex, West Basin Complex, Willow Creek, St. Johns, and Death Creek. Three new leks were also treated for the first time. They were Maggie Creek, the Saval Bench Complex, and 18 Mile. The Maggie Creek Lek Complex was inadvertently treated once by Wildlife Services. A moderate amount of ravens was observed and removed.

For the first time, two NDOW wildlife management areas were treated for the protection of waterfowl and shore birds. Those two areas were the Kirch WMA in Nye County and the Steptoe Valley WMA in White Pine County. Kirch WMA was treated on April 15, 2010, but due to high raven numbers, the Steptoe Valley WMA was treated several times starting on April 15 and ending on June 2.

#### Recommendations:

- 1) Continue raven control on sage grouse leks identified by NDOW.
- 2) Provide funding for a seasonal employee to conduct raven removal.
- 3) Use sage grouse lek, brood count and wing analysis data to determine effectiveness of raven control.
- 4) Remove ravens later into the sage grouse nesting season.

Conduct raven control in White Pine County to protect sage grouse and control ravens in other areas of the state as needed.

#### Conclusion:

In the past raven control efforts on Overton and Kirch WMA's have been successful in producing clutches of waterfowl as well as turkeys. After several years of no turkey poult production it was hypothesized that raven predation was the problem. This was based on observations of ravens preying on other nesting birds on the WMA. Subsequent to control efforts, observations by WMA personnel indicated turkey production was up following raven reductions. No protection efforts were requested by NDOW for Overton WMA in 2010.

#### FY2009

A total of 2300 treated eggs were placed. An estimated 630 ravens were removed. Both Wildlife Services and NDOW's observations indicated a dramatic reduction in raven numbers in and around the treatment areas. Wildlife Services observations indicate that a 90% or higher reduction in localized raven numbers can be achieved.

#### FY 2008

A total of 2436 treated eggs were placed. An estimated 925 ravens were removed. Both Wildlife Services and NDOW's observations indicated a dramatic reduction in raven numbers in and around the treatment areas.

**Recommendation for FY2011:** Continue with Project (21a).

**FY2011 Projected Expenditures:** WS-Nevada proposed a budget of \$16,261 to conduct raven removal within the proposed treatment areas during FY2011. A portion



of this (\$2,000) was identified for possible use if needed at the Overton WMA. This was not done in 2010 but has been done in the past.

## **Project 22: Statewide Deer and Multi Species Enhancement Project**

By Kevin Lansford, Mark Jensen and Jack Spencer

**Project Inception:** FY 2010

**Project Conclusion:** Undetermined.

**Project Areas:** Based on current information in regards to big game species. Areas will be selected on several criteria. Those will include but not be limited to:

1. Mule deer herds below carrying capacity or exhibiting long-term below average fawn/doe ratios (post-season) and/or long-term below average recruitment (spring surveys).
2. Areas where more than one species of big game animals exist.
3. Areas where long-term habitat improvements are under way.
4. Areas where recent augmentations or reintroductions are planned.
5. Areas where other big game species are below carrying capacity or exhibiting long-term below average young/adult female ratios and/or long-term below average recruitment.

**Areas for Consideration:** Specific winter and/or summer ranges in Areas 1, 3, 6, 7, 10, 11, 14, 15, 16, 17, 22, 23, and 24.

This proposal is for the perpetuation of Wildlife Service's aerial hunting program to control predatory animals for game species enhancement. Selective and timely control in designated areas based on aforementioned criteria will focus the effort in critical seasonal ranges. The funding will be applied to either existing, or proposed projects. The timing of the control work will be in accordance with the individual projects criteria, but should occur mainly on critical winter range and summer fawning areas. Wildlife Services will have the ability to utilize the funding for either fixed-wing or helicopter services. The proportion of use will be determined project by project.

The funding amount proposed in the 2011 budget is \$145,187.50 and should annually be in the range of 25% of the overall control work budget. Fixed-wing costs are \$175/hour. Helicopter costs vary by type of aircraft and estimates range between \$600 to \$850/hour plus expenses.

**FY2011 Projected Expenditures:** WS-Nevada proposed a budget of \$145,187 to conduct work within the treatment areas during FY2011.



## **Project 23: Mason Valley Pheasant**

By Kevin Lansford, Mark Jensen and Jack Spencer

**Project Inception:** 2010

**Project Description:**

In 2010 the Mason Valley Wildlife Management Area initiated a ring-necked pheasant program incorporating two surrogate incubator boxes designed to raise pheasant chicks for a period of four weeks, at which time they would be released onto the WMA. The action was planned to augment the existing wild population of ring-necked pheasants. The plan called for a total of 260 birds to be released onto the area in 2010, with another 260 slated for 2011. It was anticipated that a fairly high number of these birds would be lost to predation.

**Target Predators:** Coyotes, raccoons, skunks, badgers, and ravens.

**Desired Results:** To protect recently augmented and the existing wild population of ring-necked pheasants from predatory wildlife. Waterfowl and other upland game species such as wild turkeys located on the management area should also experience an increase in nesting success with the reduction of avian and mammalian predators.

**FY2010 Expenditures:** \$9,872

**Conclusion:** A seasonal Wildlife Specialist was employed and lived daily on the management area protecting upland and waterfowl species from predatory wildlife. During short-term predator removal efforts a total of 30 coyotes, 3 bobcats, 16 raccoons, 2 skunks and 17 common ravens was removed.

**FY2011 Projected Expenditures:** WS-Nevada proposed a budget of \$9,872.75 to conduct predator removal within the treatment area during FY2011.

## **Project 24: Predation Management Brochure and Public Outreach**

By Kevin Lansford

**Project Inception:** FY 2010

**Project Concluded.**

**Proposal:** Two pamphlets were produced and made available to the public both online and at field offices. One is on coyotes and the other on the three dollar fee. This effort was directly related to Commission Policy regarding wildlife and damage control. It was directed by both the NDOW Comprehensive Strategic Plan and the Conservation Education Division Strategic Plan.



## Project 26: Wildlife Services Field Specialist Position

By Kevin Lansford and Mark Jensen

### **Description:**

The position(s) allows flexibility to adaptively manage the needs of multiple projects. Wildlife Services was authorized to expend up to \$85,000 to facilitate personnel needs to cover ground crews for aerial operations, ground trapping, raven control, and other duties as required. A total of \$98,727 was spent by Wildlife Services in FY10 to successfully implement this project.

**FY2011 Projected Expenditures:** WS-Nevada proposed a budget of \$98,727.50 to facilitate personnel needs to cover ground crews for aerial operations, ground trapping, raven control, and other duties as required during FY2011.



## Budget Detail by Project

<b>Project 6a: Delamar Bighorn Sheep</b>	<b>2009</b>	<b>2010</b>
Salary/Benefits		\$5,956.19
GSA Vehicle	\$5,000	\$4,085.06
Dog & Horse	\$4,000	
Equipment/Supplies/Aerial Hunt	\$3,500	\$1,769.00
Hire		\$1,240.00
Travel/Camp Rate	\$2,500	\$1,903.75
Admin Overhead (16.15%)	\$2,475	\$2,415.08
<b>TOTAL WS Budget for FY 2010</b>	<b>\$17,475</b>	<b>\$17,369.08</b>

<b>Project 18: Washoe County Deer Project</b>					
<b>BUDGET ITEM</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>
	<b>Actual</b>	<b>Actual</b>	<b>Actual</b>	<b>Projected</b>	<b>Actual</b>
Salary/Benefits	\$12,465	\$16,896	\$50,335	\$54,362	\$55,769.90
APHIS Vehicle	\$2,813	\$3,801	\$13,925	\$15,039	\$7,950.83
Travel, Camp & ATV Hire	\$1,506	\$1,007	\$8,782	\$9,484	\$5,998.55
Aerial Hunting	\$4,755	\$5,715	\$9,000	\$10,500	\$2,082.50
Equip/Supplies	\$99	\$85	\$200	\$216	\$1,678.81
Administration	\$4,328	\$4,442	\$13,282	\$14,344	\$11,704.96
<b>TOTAL WS</b>	<b>\$25,966</b>	<b>\$31,946</b>	<b>\$95,525</b>	<b>\$103,945</b>	<b>\$85,185.55</b>
<b>NDOW Surveys</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$10,000</b>



<b>Project 20: Virginia Mountains BHS</b>	
<b>YEAR</b>	<b>2010</b>
Salary/Benefits	
Aerial Hunting	
Travel	\$240.00
Equipment/Supplies	
Hire	
Vehicle	\$3,812.60
Administrative Overhead	654.50
<b>TOTAL WS Budget for FY 2010</b>	<b>\$4,707.10</b>
<b>NDOW Surveys</b>	<b>\$4,500</b>

<b>Project 21: Raven Control</b>	<b>2010</b>
Salary and Benefits	\$8,564.10
Travel/Camp Rate/Per Diem	\$557.75
Equipment/Supplies	\$531.44
Hire	\$300.00
Vehicle	\$2,356.50
Admin Overhead	\$1,988.04
<b>TOTAL WS Budget for FY 2010</b>	<b>\$14,297.83</b>

<b>Project 22: Multi-Species</b>	<b>2010</b>
Salary/Benefits	
Aerial Hunting	\$109,145.00
Travel	\$2,400.00
Equipment/Supplies	
Hire	
Vehicle	\$5,899.63
Admin Overhead	\$18,967.31
<b>TOTAL WS Budget for FY 2010</b>	<b>\$136,411.94</b>
<b>NDOW Surveys</b>	<b>\$6,500</b>



<b>Project 23: Mason Valley Pheasant</b>	<b>2010</b>
Salary/Benefits	\$3,573.89
Aerial Hunting	
Travel	\$1,523.50
Equipment/Supplies	\$1,316.99
Hire	
Vehicle	
Admin Overhead	\$1,035.93
<b>TOTAL WS Budget for FY 2010</b>	<b>\$7,450.31</b>

<b>Wildlife Services Specialist</b>	<b>2010</b>
Salary/Benefits	\$36,584.75
Aerial Hunting	
Travel	\$5,533.32
Equipment/Supplies	\$898.73
Hire	\$980.00
Vehicle	\$9,893.36
Admin Overhead	\$8,703.26
<b>TOTAL WS Budget for FY 2010</b>	<b>\$62,593.42</b>

<b>Emergency Fund</b>	<b>2010</b>
Salary/Benefits	\$6,945.50
Aerial Hunting	
Travel	\$7,160.50
Equipment/Supplies	
Hire	\$3,100.00
Vehicle	
Admin Overhead	\$2,778.77
<b>TOTAL WS Budget for FY 2010</b>	<b>\$19,984.77</b>



<b>Total USDA Amended Budget</b>	<b>348,000.00</b>
<b>Billed July 2009-June 2010</b>	<b>348,000.00</b>

<b>July 2009 to June 2010 Summary of Nevada Department Of Agriculture Billings</b>			
<b>NDOA Mt. Lion Specialists (State)</b>	<b>Kilby</b>	<b>Buhler</b>	<b>Totals</b>
Salary and Benefits	\$12,927.92	\$25,013.89	\$37,941.81
GSA Vehicle			
Dog & Horse Hire	\$1,624.40	\$3,039.77	\$4,664.17
Supplies/Aerial Hunt			
Camp Rate	\$679.38	\$1,631.69	\$2,311.07
Admin Overhead	\$2,459.92	\$4,623.03	\$7,082.95
<b>TOTAL NDOA for FY 2010</b>	<b>\$17,691.62</b>	<b>\$34,308.38</b>	<b>\$52,000.00</b>

<b>Total USDA Billing</b>	<b>\$348,000.00</b>
<b>Total NDOA Billing</b>	<b>\$52,000.00</b>
<b>Total Billed July 2009-June 2010</b>	<b>\$400,000.00</b>

<b>FY 2010 Expenditures and FY 2011 Starting Balance</b>	
Starting Balance for FY2010.	\$631,471.00
NDOW FY 2010 July-June Expenditures.	-\$90,379.00
WS FY 2010 July-June Expenditures.*	-\$400,000.00
Carry-Forward to FY2010.	\$141,092.00
\$3 Fee Collected in FY2010 for FY2011.	\$387,432.00
Predator Donations Collected in FY2010 for FY2011.	\$12,789.00
<b>Starting Balance for FY 2011.</b>	<b>\$541,313.00</b>

**\*Administrative Overhead for Wildlife Services in 2010 was \$56,333.80 (16.4%).**



PREDATION MANAGEMENT PROGRAM BUDGET FY 2011				
<i>July 1, 2010 Beginning Balance</i>				<b>\$541,313</b>
Item	Unit	Day	Commission Recommended 2011 Budget	TOTALS
<b>Wildlife Services Approved Projects:</b>				
Project 6B - Delamar BHS			\$90,000.00	
Project 18 - Granite Range Deer			\$93,564.00	
Project 20 - Virginia Mtns. BHS			\$17,678.03	
Projects 21a & b Sage Grouse/Upland			\$16,261.00	
Project 22 Multi Species			\$145,187.00	
Project 23 Mason Valley			\$9,872.75	
Project 26 WS Specialist			\$98,727.50	
Total				<b>\$471,290.28</b>
<b>NDOW Budget: Salary</b>				
				*Productive Hrly Rt.
Game Bureau Chief			\$62.61	
Staff Biologist			\$54.02	
Field Biologists			\$48.83	
Administrative Assistants			\$35.65	
<b>TOTAL</b>				<b>\$40,000</b>
<b>Operating</b>				
Project 25 USU Coyote Study			\$25,000	
Additional Flight Surveys (same as FY10)			\$21,000	
<u>Total Flight Surveys and other operating</u>				<b>\$55,000</b>
<b>In-State Travel</b>				
<b>Mileage (Vehicle use)</b>	\$0.50	4,500		<b>\$900</b>
<b>Fixed Costs (Uniforms etc.)</b>				<b>\$200</b>
				<b>NDOW: \$148,350</b>
<b>TOTAL FY2011 PROGRAM EXPENDITURES:</b>				<b>\$594,640.28</b>
<b>REVENUE 2010-11:</b>				
			Fees collected from Tag Applications**	<b>\$388,000 (projected)</b>
			Donations through Tag Application processes:	<b>\$13,000 (projected)</b>
<b>June 30, 2011 Ending Balance (Beginning Balance for FY2012): ESTIMATED.</b>				<b>\$372,672.72</b>

\*PRODUCTIVE HOURLY RATE IS A CALCULATION FOR THE COST ASSOCIATED TO FULLY FUND PERSONNEL WHICH INCLUDES SALARY/BENEFITS/LEAVE AND OTHER RELATED EXPENSES.

\*\* APPLICATION PROCESSES ARE FALL TURKEY, SPRING TURKEY, GUIDED DEER, MAIN BIG GAME, SECOND BIG GAME, FIRST COME FIRST SERVED, AND MOUNTAIN LION DRAWS/TAG SALES.

