

**Predation Management Plan**

**Panhandle Elk Zone**

**April 2014**



**Idaho Department of Fish and Game**

**600 S. Walnut Street**

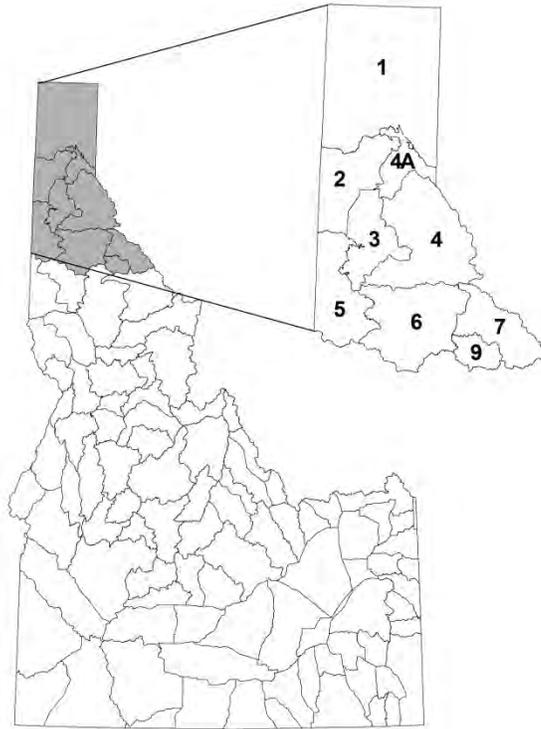
**Boise, ID 83707**

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## PANHANDLE ELK ZONE



### **INTRODUCTION**

Consistent with the Fish and Game Commission's Policy for Avian and Mammalian Predation Management (IDFG 2000), this management plan identifies actions and objectives to stabilize and recover elk populations in a portion of the Panhandle Elk Management Zone (PEZ) and identifies approaches to monitor effects of these actions on elk and predator populations. Most of the land within the affected area is under federal ownership and managed by the Idaho Panhandle National Forest (IPNF). Actions will be taken that are consistent with Forest Plan objectives and in conjunction with state management plans for gray wolves (*Canis lupus*), black bears (*Ursus americanus*), mountain lions (*Puma concolor*), and elk (*Cervus elaphus*) to ensure that species' management objectives are met.

### **DEFINITION OF PROBLEM**

The PEZ is one of the largest zones in the state, including 9 Game Management Units (GMUs) and encompassing 7,779 square miles. Land ownership patterns, the influence of weather,

habitat conditions, and predator densities vary within the PEZ, resulting in different elk population levels in geographically distinct portions of the zone.

Practical considerations (primarily short periods during which surveys can be flown, heavy cover and large areas with dispersed elk herds) disallow a zone-wide population estimate. Elk problems are not ubiquitous in the PEZ. Harvest data and surveys of calf recruitment suggest few problems in GMUs 1, 2, 3, and 5, areas of concern in GMUs 4, 4A, and much of GMU 6, but substantial problem in GMUs 7 and 9, and the eastern portion of GMU 6. As such, at this time the remainder of this predation management plan will focus in GMUs 6, 7, and 9, including portions of the St. Joe and Little North Fork Clearwater River drainages.

Elk numbers declined in the St. Joe Elk Bellwether Area from 3,751 to 3,256 (- 13%) from 2006 to 2009, and then to 1,263 by 2012 (a further 61% for a total 66% decline from 2006 to 2012). The ratio of calves to cow elk during mid-winter surveys since 2012 has ranged from 12 to 22 per 100. Modeling indicates continued declines through 2014.

Based on research on causes of elk mortality conducted in the elk management zones immediately adjacent to PEZ to the south (Lolo and Selway), wolves are likely a major source of juvenile and female elk mortality especially during winter, thus reducing the recruitment of juveniles into the herd and preventing the female elk component of the population from reaching management objectives (Pauley and Zager 2011).

## ELK POPULATION OBJECTIVES

Differences in elk herds within the PEZ were reflected in different objectives in the 2014 Elk Management Plan (IDFG 2014). GMU-specific objectives were developed, based on groupings of GMUs with similar elk population status (Table 1), and growth rates felt to be realistically attainable under good conditions. A 10-year growth objective of 40% was identified for GMUs 6, 7, and 9.

Table 1. GMU-specific objectives for elk in the Panhandle Zone from 2014 Elk Management Plan.

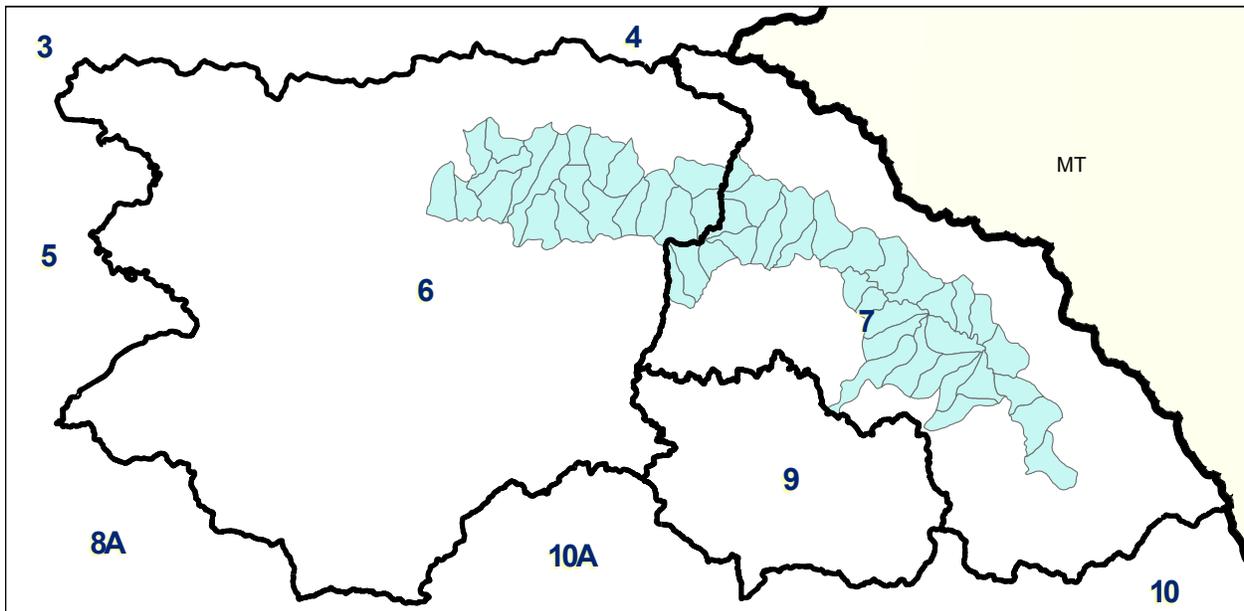
GMU	Population Trend		2023 Growth Objectives
	Current Status	Objectives	
1	Little change to increasing	Stable to increase	Up to 25% more elk
2,5	Increasing	Stabilize to decrease depending on human population growth/agricultural and depredation issues	Within 10% of existing levels
3,4,4A	Little change	Stabilize	Up to 20% more elk
6,7,9	Decreasing	Increase	Up to 40% more elk

## ELK POPULATION STATUS

### Population Size

Funding and time constraints do not allow consistent monitoring of elk populations on a rotational GMU scale or within a year at the PEZ scale. Heavy continuous cover, limited weather suitable for flying, and often dispersed elk herds severely restrict this methodology. Consequently, monitoring of elk numbers has been adjusted to focus on two bellwether areas, smaller portions of GMUs where elk population objectives can be monitored more consistently. The St. Joe Bellwether Area (SJBA), approximately 258 square miles in size, consists of portions of GMU 4, 6 and 7 (Figure 1).

Figure 1. GMUs 6, 7, and 9 with the St. Joe Bellwether Area shaded in blue.



Monitoring results suggested elk herd growth between 1998 and 2002 and no substantive change between 2002 and 2009 (Table 2). From 2009 through 2012, the elk herd in the SJBA declined 61%. Attaining the 10-year goal of a 40% gain would result in a population of 1,768 elk. Return to the average 1998-2009 average of 3,156 elk (a 150% gain) or the 2002 high of 3,826 elk (a 203% gain) would take considerably more than the 10-year timeframe of the 2014 Elk Plan.

Table 2. Aerial elk survey estimates from bellwether area ( $\pm 90\%$  Bounds).

Year	POPULATION SIZE
1998	2087 $\pm$ 468
2000	2860 $\pm$ 442
2002	3826 $\pm$ 812
2006	3751 $\pm$ 535
2009	3256 $\pm$ 700
2012	1263 $\pm$ 266

### Survival Rates of Cow Elk

IDFG placed radio collars on 26 adult female elk in GMUs 6 and 7 and monitored them from 1995 – 1998 to determine annual adult elk survival rates. Another collaring effort took place from 2011 – 2013 when 39 adult female elk were radio-collared.

Survival rates were similar between the two periods (Table 3) although small sample sizes and the lack of reported confidence intervals (CIs) for the early time period make comparisons difficult. Further, survival rates during the 1990s occurred in the presence of an either-sex elk season; the season was changed to an antlered-only season after 2012.

Table 3. Adult female elk survival rates in the St Joe River drainage, GMUs 6 and 7, 1995 – 1998 and 2011 – 2013. (n=26 for 1995-98; n=39 for 2011-2014).

Time Period	Survival Rate	95% C.I.
Jun 1995 – May 1996	0.92	Not reported
Jun 1996 – May 1997 <sup>a</sup>	0.78	Not reported
Jun 1997 – May 1998	1.00	Not reported
Jun 2011 – May 2012	0.88	0.73-1.00
Jun 2013 – May 2013	1.00	---
Jun 2013 – Feb 2014	0.92	0.81-1.00

<sup>a</sup> Severe winter

### Pregnancy Rates

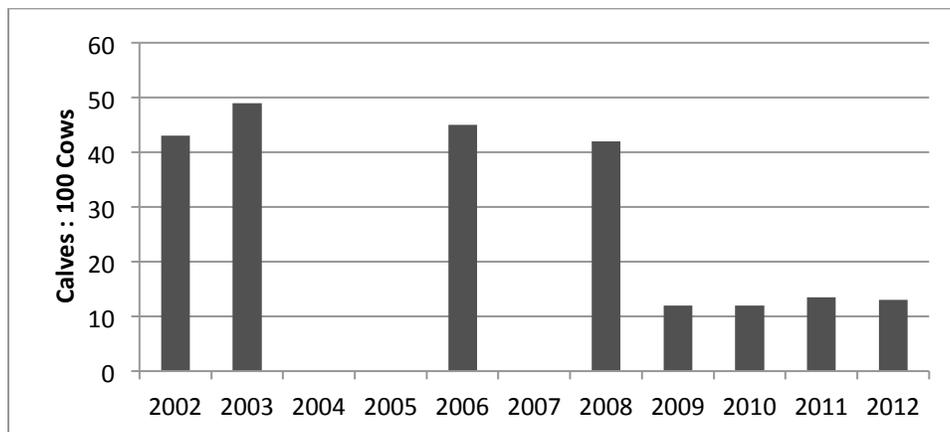
Cow elk that were captured for the radio-collaring effort in 2013 were tested for pregnancy. Seventeen of eighteen elk were pregnant for a 94% pregnancy rate. While these data are too sparse to be conclusive, they are consistent with normal to high pregnancy rates and higher than pregnancy rates found in north-central Idaho (Pauley and Zager, 2010).

## Recruitment

As stated earlier, population size in the PEZ is difficult to obtain due to weather constraints and heavy cover. As such, recruitment, which is more achievable, is used as an indicator of population health. Recruitment estimates are reported as the number of calves observed per hundred cows (calf:cow ratios). Composition flights are typically conducted in winter (Jan-Feb) but some summer composition flights have also been conducted to examine timing of changes in recruitment estimates within the year.

For the SJBA, winter calf:cow ratios were relatively consistent from 2002 – 2008, but in 2009 there was an abrupt decline in the winter calf:cow ratio following severe deep-snow winters of 2008/09 and 2009/10. Since then, calf:cow ratios have remained low (Figure 2) despite relatively mild winters and lack of major vegetative changes (e.g. large-scale fires).

Figure 2. Winter recruitment rates (calves:100 cows) from sightability surveys in the SJBA, 2002-2012.



Winter recruitment surveys were also conducted in the STBA during 2013 and 2014 (22 calves per 100 cows each year), but these surveys were conducted only to assess recruitment without the stratified random sampling design and correction for observability used in sightability surveys. Additionally, summer composition flights were conducted within the SJBA during 2013 to further assess recruitment and timing of calf mortality. The 29 calves per 100 cows observed during August 2013 was lower than those observed during prior flights in 1980, 1998, and 1999, which yielded 44, 42, and 39 calves:100 cows, respectively.

## Cause-specific Mortality of Elk

IDFG has collected data through the use of radio-collars regarding the causes of elk mortality between 2006 and 2012 from the Sawtooth, Lolo, and Selway Zones, which are located immediately south and north of the MFZ. Legal harvest was documented as the primary cause of mortality for adult male elk, while wolf predation and malnutrition were documented as the leading causes of mortality for both females and calves  $\geq$  six months (Pauley and Zager 2011).

Neonate elk (< 6 months) are killed primarily by predation from bears and lions (Schlegel 1986, Zager and White 2003), although predation by wolves, malnutrition, and other causes can be important factors (Zager et al. 2007).

### **Elk population summary**

The elk objective for GMUs 6, 7, and 9 under the 2014 Elk Management Plan (IDFG 2014) calls for an increase of up to 40% in elk from existing numbers by 2023. Instead, this segment of the Panhandle elk herd appears likely to continue decreasing (the most recent observed annual rate of decrease is 11%) without additional action. Based on stable annual survival rates of radio-collared adult cow elk averaging 93% over the past 3 years and high pregnancy rates, calf survival appears to have the most significant influence on elk population trends.

## **HABITAT POTENTIAL**

Declining elk habitat conditions caused by a shift from early forest seral stages to less productive mid- to late-seral stages have been a source of concern for decades. Summer range habitat should include a mosaic of successional stages. Early seral habitat is more likely to provide preferred grass and forbs species. High quality summer habitat can improve elk body condition as well as cow and calf survival over the winter. Winter range habitat is primarily south-facing early-seral shrubfields that provide forage and solar exposure.

Significant fires throughout the Panhandle zone in the 1910-1940s created young productive forests that benefitted elk. Fire suppression since the 1940s and reduced timber harvest on federal lands in recent decades has resulted in an aging forest that is less productive for ungulates. Currently across the Idaho Panhandle National Forest, less than 10% of the forest is in the youngest age class. Based on historic vegetation trends, the desired condition is to have 15-28% of the forest in an early seral stage (USDA Forest Service 2011). This lack of both summer forage and winter range available to elk in some areas of the forest may be contributing to lower calf survival. However, the lack of recovery in calf recruitment after the abrupt calf recruitment drops following the 2007/2008 and 2008/2009 winters suggests habitat is not the most limiting proximate factor. The 2014 Elk Management Plan identifies the PEZ habitat limitations as moderate.

## **EFFECTS OF WEATHER**

Winter weather can have a significant impact on elk populations in the Panhandle. A major winter event in 1996-97 caused a significant die-off that resulted in a population decline in portions of GMUs 7 and 9. Back-to-back severe winters during 2008-09 and 2009-10 further contributed to low elk survival in these areas, particularly through calf survival as evidenced by low mid-winter calf ratios (Figure 2). Weather can exacerbate the influence of predation

(Hebblewhite et al. 2005) by making elk more vulnerable to predation during the winter, concentrating them on key winter ranges and weakening individuals. Moderate winters from 2011 to 2014 were not associated with a recovery in elk recruitment, however, suggesting other factors were dominating calf survival. By comparison, moderate winters following 1996-97 resulted in high calf recruitment and a subsequent rebound in adult elk numbers.

Habitat conditions and weather work in concert to affect elk populations. For example, calf birth weight, which is influenced by maternal health, has been identified as an important factor in calf survival in many studies (Singer et al., 1997, White et al. 2010 and more). Maternal health is influenced by both weather and habitat quality.

## **EFFORTS TO ADDRESS PANHANDLE ZONE ELK DECLINE**

This predation plan will provide steps to address the 2014 Elk Management Plan (IDFG 2014) objectives of increasing elk up to 40% in GMUs 6, 7, and 9.

### **Changes in Elk Hunting Seasons and Harvest Strategies**

In response to declining elk numbers and low calf recruitment, IDFG reduced the length of the either-sex portion of the general elk season in GMUs 7 and 9 from 7 days in 2007 to 3 days in 2008 and eliminated all antlerless harvest in GMUs 6, 7, and 9 in 2011. Antlered harvest, hunter numbers, and the percent spikes in the harvest have all declined during that time (Table 4).

Table 4. Elk harvest, hunter numbers, and % spikes in the harvest, GMUs 6, 7, 9; 2003 – 2012.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>Antlerless Harvest</b>	76	64	79	63	93	36	34	29	0	0
<b>Antlered Harvest</b>	209	201	263	278	251	178	120	112	62	75
<b>Hunter Numbers</b>	2316	2190	2163	2273	2160	2189	1343	1432	1081	782
<b>% Spikes</b>	15.9	36.6	31.3	12.9	10.5	13.8	5.7	25.7	10.8	3.5

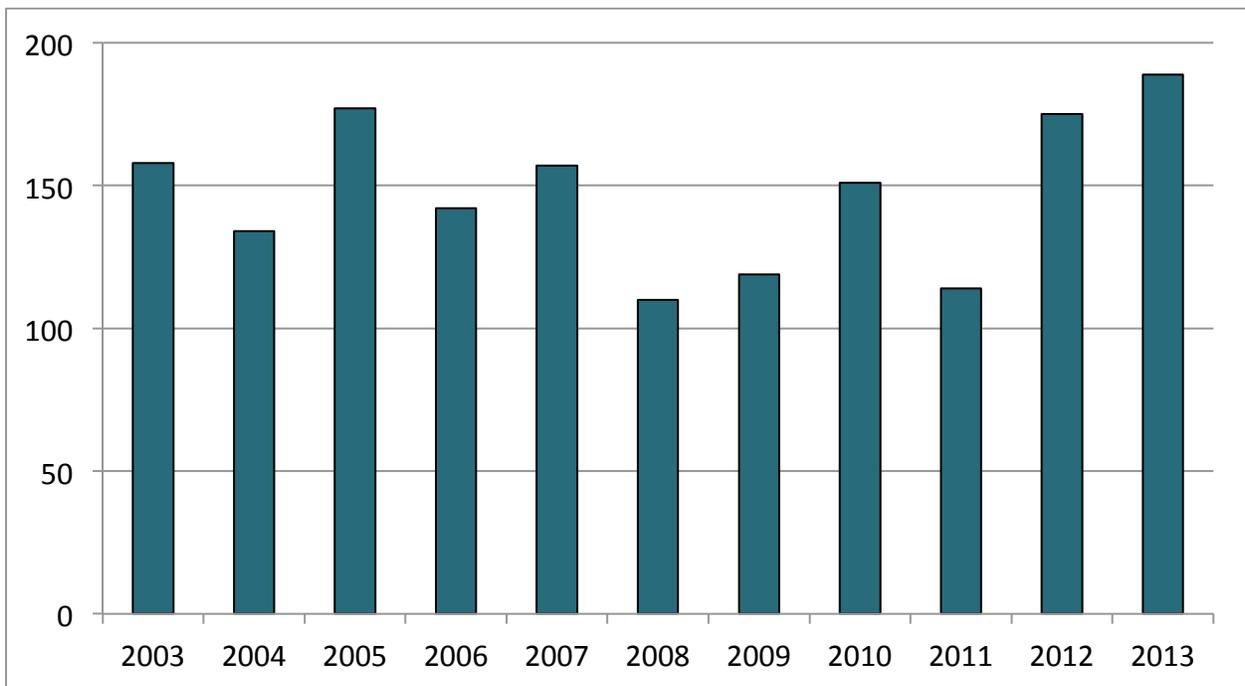
### **Changes in Black Bear Hunting Seasons and Harvest**

Fall black bear seasons in GMUs 6, 7, and 9 have been consistent for over 10 years. The season is open Aug 30 - Oct 31. Spring seasons were consistent until 2012. Prior to 2012, the spring season in GMU 6 ran from Apr 15 – May 31 and in GMUs 7 and 9 from Apr 15 – Jun 30. In 2012 an effort was made to increase harvest in these GMUs. The spring season in 6, 7, and 9

was extended to Jun 30 and a second bear tag could be used. In 2013, the spring season in GMUs 7 and 9 was further extended to Jul 31. A second bear tag and electronic calls could be used in GMUs 6, 7, and 9.

Harvest in GMUs 6, 7, and 9 (Figure 3) is impacted by spring access and the fall berry crop. These GMUs are targeted for “moderate” harvest levels in the Black Bear Management Plan (IDFG 1998). Harvest criteria generally fall into the light to moderate categories but small sample sizes result in significant fluctuation. There is room for additional harvest in these GMUs, yet providing a bear population within the management guidelines. Harvest density in GMU 6 during the 2013 season was the highest of any GMU in the state.

Figure 3. Black bear harvest in GMUs 6, 7, and 9; 2003-2012.



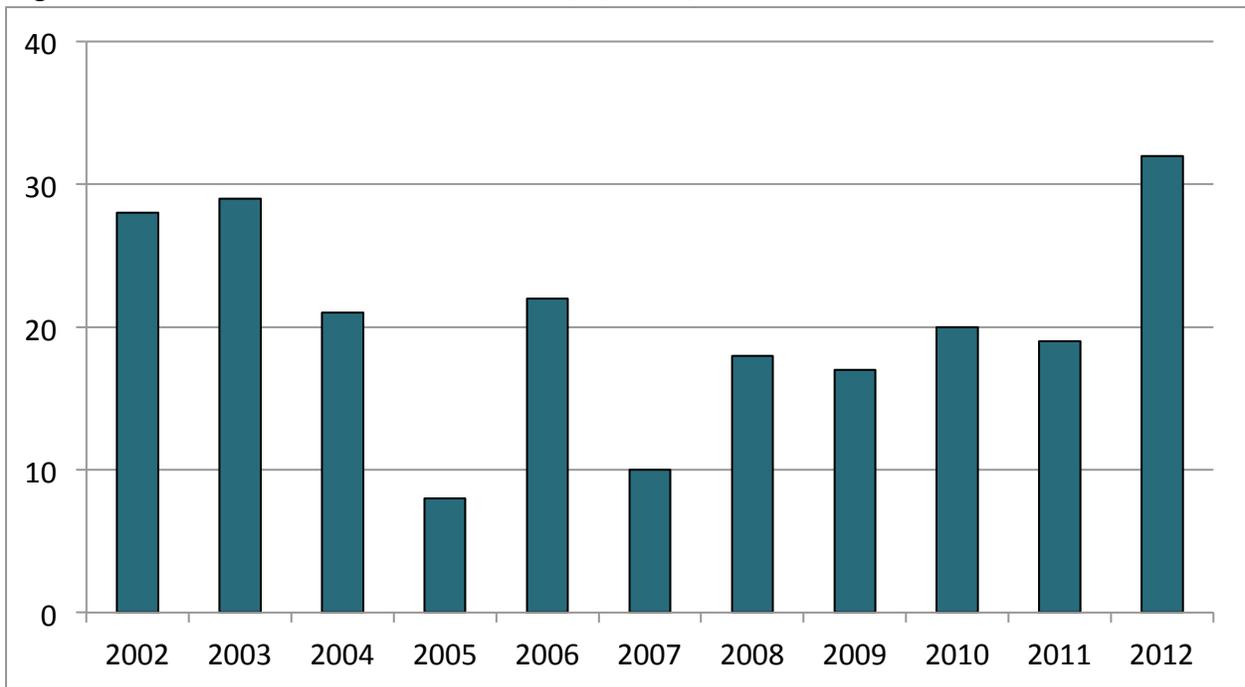
#### **Changes in Mountain Lion Hunting Seasons and Harvest**

Mountain lions seasons in GMUs 6, 7, and 9 were fairly stable until 2012/13 season. The 2011/2012 season ran from Sep 15 – Feb 16. In 2012/2013 the season was extended to Mar 31. In 2013/2014 the season was extended in GMUs 7 and 9 to June 30 and the use of a second tag and electronic calls was allowed.

Harvest levels vary significantly in these GMUs (Figure 4) depending on snow and access conditions as well as conditions in other GMUs within the Panhandle. Within the entire PEZ harvest levels are significantly above the Mountain Lion Management Plan’s objective of maintaining a harvest of at least 61 animals (IDFG 2002); the harvest in the 2013/2013 season

was 130, allowing for significantly more harvest while still being within the harvest guidelines.

Figure 4. Mountain lion harvest in GMUs 6, 7, and 9; 2003 – 2012.



#### Changes in Wolf Hunting Seasons and Harvest

Idaho's first wolf season occurred in 2009/2010. Hunting and trapping seasons are summarized in Table 5. There was no hunting or trapping seasons in 2010/11 because of the federal re-listing of wolves on the Endangered Species List.

Wolf harvest in GMUs 6, 7, and 9 has ranged from 18 wolves during the initial harvest year of 2009, when only hunting was allowed, to 31 wolves during 2011/2012, with the addition of trapping, larger bag limits, and longer seasons (Table 6). During years when trapping was allowed, trapping was the primary harvest method.

Table 5. Wolf trapping and hunting seasons in the Panhandle Zone, 2009-2014.

Year	Quota	Hunting Season	# of Hunting Tags	Trapping Season	# of Trapping Tags
2009/10	30	Oct 1 – Mar 31	1	None	--
2010/11	No Season				
2011/12	None	Aug 30 – Mar 31	2	Nov 15 – Mar 31	3
2012/13	None	Aug 30 – Mar 31	5	Nov 15 – Mar 31	5
		July 1 – Mar 31 (private lands only)			
2013/14	None	Aug 30 – Mar 31	5	Nov 15 – Mar 31	5
		July 1 – Mar 31 (private lands only)			

Table 6. Human-caused wolf mortality in GMUs 6, 7, and 9 since 2009-2010.

Year	Hunting	Trapping	Other Human-caused Mortality <sup>b</sup>	Total
2009/10	14	--	4	18
2010/11	--	--	1	1
2011/12	13	18	0	31
2012/13	4	21	3	28
2013/14 <sup>a</sup>	10	6	0	16

<sup>a</sup> Through Feb 16, 2014

<sup>b</sup> Includes illegal kills, control actions, road kill, etc.

## PREDATION MANAGEMENT PROGRAM

### PROPOSED ACTIONS

This Predation Management Plan considers the entire PEZ. While predation management is not precluded elsewhere in the PEZ, predation management under this plan will focus efforts in those portions of GMUs 6, 7, and 9 with demonstrated severe elk declines.

### **Black Bears**

Regulated harvest by licensed hunters is IDFG's preferred tool for reducing black bears in areas within the PEZ. IDFG has lengthened seasons in GMUs 6, 7, and 9, allows the use of hounds, bait, electronic calls, and the use of second tag in all of these GMUs.

Harvest densities are relatively high in this area; black bear harvest density from 2012-2014 in GMU 6 ranks 2nd and GMU 7 ranks 6th out of the 99 GMUs in the state. Harvest has shown an increasing trend over the past 5 years (Figure 3) while still falling within the management criteria in the black bear management plan. The objective under this predation management plan is to maintain bear harvest at 180 or above (25% above the previous 10-year average) for 2014 – 2019.

There are a limited number of options to increase harvest by licensed hunters. The only month that is not open to harvest during the time when bears are out of the den in August. IDFG could allow harvest during this time period. Control actions coordinated with Wildlife Services could be undertaken on black bears if it was determined that this would benefit elk survival during specific times of the year.

### **Mountain Lions**

Regulated harvest by licensed hunters is IDFG's preferred tool for reducing mountain lions in areas within the PEZ. IDFG has lengthened seasons in GMUs 6, 7, and 9 and allows the use of hounds. A second tag and the use of electronic calls are allowed in all of these GMUs.

Harvest densities are relatively high in this area; mountain lion harvest density from 2012-2014 in GMU 7 ranks 7th and GMU 6 ranks 11th out of the 99 GMUs in the state. Mountain lion harvest increased significantly in these GMUs in 2012, but harvest can be greatly affected by snow conditions. The mountain lion harvest is still well above the criterion established in IDFG's mountain lion management plan (IDFG 2002). The objective under this predation management plan is to maintain lion harvest at 24 or above (25% above the previous 10-year average) for 2014 – 2019.

IDFG has limited options to increase mountain lion harvest by licensed hunters. Seasons could be extended, however past history has shown little effect of longer seasons outside of the period when dogs can effectively be used. IDFG could coordinate control actions with Wildlife Services if it was determined that reducing mountain lion densities in some GMUs would benefit ungulate survival rates.

### **Wolves**

Regulated harvest by licensed hunters and trappers is IDFG's preferred tool for reducing wolves

in the PEZ. Because hunting and trapping is a new activity, there is not a group of hunters or trappers with a significant history of wolf harvest. Both of these activities have a “learning curve” that will allow hunters and trappers to become more effective through time. Regulations have been changing since wolves were allowed to be taken through sport hunting in 2009 so investigation of harvest trends is not appropriate. IDFG currently offers liberal opportunities and limits for wolf hunting and trapping (Table 5).

Harvest densities in GMUs 6 and 7 are relatively high; wolf harvest density from 2012-2014 in GMU 6 ranks 11<sup>th</sup> and GMU 7 ranks 13<sup>th</sup> of 99 GMUs in the state. Harvest density varies from year to year, depending on weather, access, and wolf density. Current wolf harvest in GMUs 6, 7, and 9 (as of 04/01/2014) is 16 wolves, 43% below the prior 2-year average.

Existing liberal wolf harvest seasons will likely be kept in place through 2019. Management of wolves in these GMUs will be adaptive and will rely on monitoring to determine the appropriate management actions. IDFG will monitor legal harvest levels and adjust seasons and control actions accordingly while staying consistent with the Idaho Wolf Conservation and Management Plan (Idaho Legislative Wolf Oversight Committee 2002).

IDFG recently extended the trapping season in GMUs 7 and 9 and a portion of GMU 6. The trapping season will start on October 10 in the 2014 season in an attempt to increase harvest. The results of this change are unknown at this time. IDFG could lengthen the hunting season on public lands; the current season ends March 31 on public lands and runs year-round on private lands. The use of bait for hunting wolves is currently not allowed. Allowing wolf hunters to hunt over bait for wolves during the open season, especially in the winter months, may increase their effectiveness and increase wolf harvest. If deemed necessary, IDFG could hire hunters and trappers after the regulated harvest season closes to remove additional wolves from specific areas if deemed necessary. IDFG could contract with Wildlife Services to remove additional wolves through means such as hunting, trapping, and aerial gunning if it felt these actions were warranted.

## **OBJECTIVES AND MEASURES OF SUCCESS**

The goal of the Predation Management Plan is to restore elk numbers and elk hunting opportunities. The specific objective is to provide an elk herd exhibiting an average 1% to 5% annual rate of growth in GMUs 6, 7, and 9 for 10 years, consistent with objectives of the Idaho 2014 Elk Management Plan (IDFG 2014). To achieve this objective IDFG will seek to affect elk population parameters through a variety of means, including improving elk habitat and reducing predator populations without affecting their viability.

Success will be measured by tracking a variety of parameters, including elk calf:cow ratios, the percent of yearling elk in the harvested population, and elk population trend.

## **MONITORING**

Monitoring is a key component of any predation management plan and integral to adapting and refining management. Both predators and prey must be monitored to provide an adaptive framework for decisions.

### **Elk**

Harvest characteristics will continue to be monitored annually through a mandatory hunter report card system. Recruitment will be monitored annually through winter aerial survey flights to estimate calf:cow ratios. Summer composition flights may be flown if deemed necessary to help determine timing of calf:cow ratios.

### **Black Bear, Mountain Lion, and Wolves**

IDFG will monitor black bear, mountain lion, and wolf harvest through required harvest checks and Big Game Mortality Report (BGMR) forms. Harvest checks involve the extraction of a tooth for aging and collection of a meat sample for DNA analysis of wolves. BGMRs are required for all hunter-harvested animals and other mortality causes, such as road-killed animals. BGMRs provide detailed information on age, sex, location, and date and method of harvest. Harvest levels, age composition, and the sex ratio of the harvest are management criteria for black bears and mountain lions.

IDFG will manage black bears and mountain lions to maintain criteria identified in each species statewide management plan. IDFG will continue statewide monitoring of the wolf population to ensure compliance with post-delisting population criteria, including an estimate of the minimum number of wolves and breeding pairs on an annual basis. In addition to this required monitoring, IDFG will be radio-collaring pups and adults, conducting genetic surveys of historic and predicted rendezvous sites (Ausband et al. 2010), using remote cameras, and estimating exploitation rates using DNA collected from rendezvous sites and hunter-harvested wolves.

## **BUDGET**

The funds required to implement actions in this plan are available as part of larger, ongoing IDFG programs. Aerial surveys are funded through statewide ungulate monitoring budgets. Funds for these efforts come from a combination of Pittman-Robertson funds, federal wolf appropriations, and IDFG license dollars. If lethal removal is required only license funds will be used.

## **RISK ASSESSMENT**

### **PREDATOR POPULATIONS**

IDFG's actions under this plan will be limited to black bears, mountain lions, and wolves.

Black bear management objectives in these GMUs are targeted for "moderate" harvest levels (IDFG 1998). Harvest criteria generally fall into the light to moderate categories but small sample sizes result in significant fluctuation. There is room for additional harvest in these GMUs and still be within the management guidelines.

The mountain lion management plan identifies the objective of a cougar population large enough to sustain a harvest of 61 cougars per year (the 1990-1992 average). During the past 10 years, the (entire) PEZ has sustained a harvest of 109 mountain lions per year; the most recent 3-year average harvest was 122. Reducing restrictions on mountain lion hunting would still provide a large enough mountain lion population to meet management objectives (IDFG 2002).

Holyan et al. (2013) reported  $\geq 117$  wolf packs and  $\geq 35$  documented breeding pairs in Idaho. Of the 117 packs, 9 used portions of GMUs 6, 7, and 9 in 2012. One of these packs was identified as a breeding pair. More than 500 wolves reside outside of the area encompassed in the predator management plan. Criteria identified under the Idaho Wolf Conservation and Management Plan will not be compromised.

### **PREY POPULATIONS**

Elk will be the primary species benefitting from the proposed actions in this plan. Mule deer, white-tailed deer, and moose may benefit as well.

### **WILDLIFE-ASSOCIATED RECREATION OPPORTUNITY**

Actions created through this plan would initially provide more opportunity for bear, mountain lion, and wolf hunting and trapping (wolves only). However, ultimately the goal of the plan would result in a decline of those species and correspond to an eventual decline in hunting and trapping opportunities.

The primary objective of this plan is to increase elk populations, thereby providing additional hunting and wildlife viewing opportunities for this species, including the possible re-establishment of the either-sex general elk hunt that has been a strong tradition in northern Idaho.

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