

Predation Management Plan for the Middle Fork Elk Zone

February 2014



Idaho Department of Fish and Game

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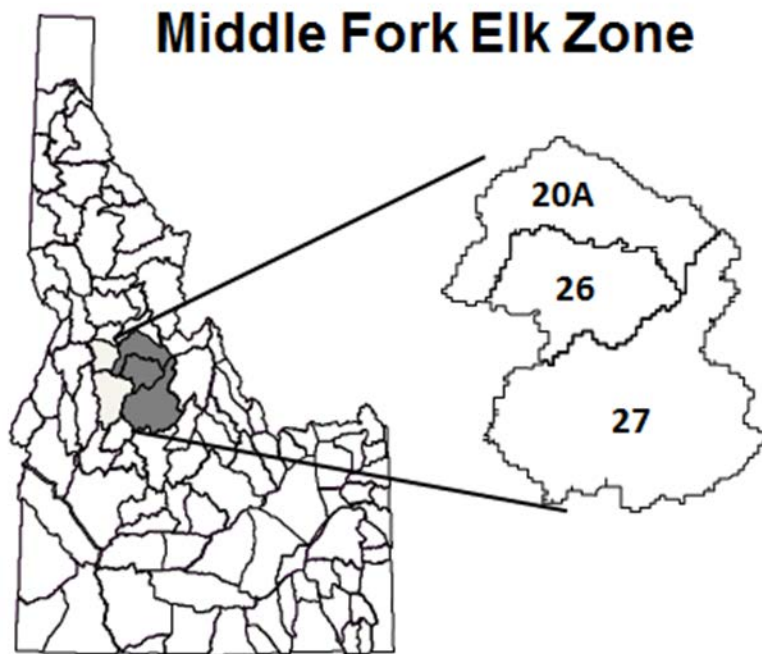
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INTRODUCTION

Consistent with the Fish and Game Commission's (Commission) "Policy for Avian and Mammalian Predation Management (IDFG 2000)," this management plan identifies actions and objectives to stabilize and recover elk populations in the Middle Fork Zone (MFZ), and identifies approaches to monitor effects of these actions on elk and predator populations. Most of the MFZ is comprised of the Frank Church River of No Return Wilderness and in federal ownership, managed by the U. S. Forest Service (USFS). Actions will be taken in consideration of congressional wilderness designation and in conjunction with state management plans for individual species (gray wolf [*Canis lupus*], black bear [*Ursus americanus*], mountain lion [*Puma concolor*], and elk [*Cervus elaphus*]) to ensure species management objectives are met.

DEFINITION OF PROBLEM

Total elk numbers in the MFZ declined from 7,485 to 6,958 (-7%) from 2002 to 2006, and then to 4,229 by 2011 (an additional 39% for a total loss of 43% since 2002). Cow elk and bull elk numbers in the MFZ have declined 35% and 45%, respectively, between the 2006 and 2011 aerial surveys and are below population management objectives. The ratio of calves to cow elk during in the 2011 winter survey was less than 13 calves per 100 cows, suggesting further decline beyond 2011.

This low level of reproductive success is well below that needed to recover the herd, and at its current level, the elk population will continue to decline. Based on research on causes of elk mortality conducted in the elk management zones immediately adjacent to MFZ to the north

(Lolo and Selway) and to the south (Sawtooth), 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). Based on population modeling, the MFZ elk population is expected to continue to decline at 3 to 7% annually if predation rates are not reduced.

ELK POPULATION OBJECTIVES AND CURRENT STATUS

Management objectives for elk in the MFZ call for maintaining 3,850 – 5,750 female elk and 690 - 1,030 male elk, of which 390 - 810 are adult males (defined as branched-antler bulls during winter) (IDFG 2014). The most recent survey (2011) indicated that all components of the elk population were below population objectives (Table 1, Figs. 1-2). The cow to calf ratio in the MFZ declined substantially after 1995 (Fig. 3).

Table 1. Population objectives and status of Middle Fork Zone elk 1989 – 2011 (elk sightability surveys).

Objective ^a	F	M	Adult M	M:100 F	Ad M: 100 F
	3,850-5,750	690-1030	390-810	25-29	14-18
Year					
1989	4,225	933	543	22.1	12.9
1992	5,525	1,217	691	22.0	12.5
1995	6,365	1,314	865	20.6	13.6
1999 ^b	6,383	855	619	13.4	9.7
2002	4,613	875	475	19.0	10.3
2006	5,137	834	450	16.2	8.8
2011	3,341	462	276	13.8	8.3

^a Prior to the adoption of the 2014-2024 Elk Management Plan, the population objectives for males was 950-1,550 and adult males was 600-900. IDFG adjusted this objective to better reflect realistic potential for population growth during this 10-year period.

^b Values for GMU 26 portion of this estimate based on a partial survey.

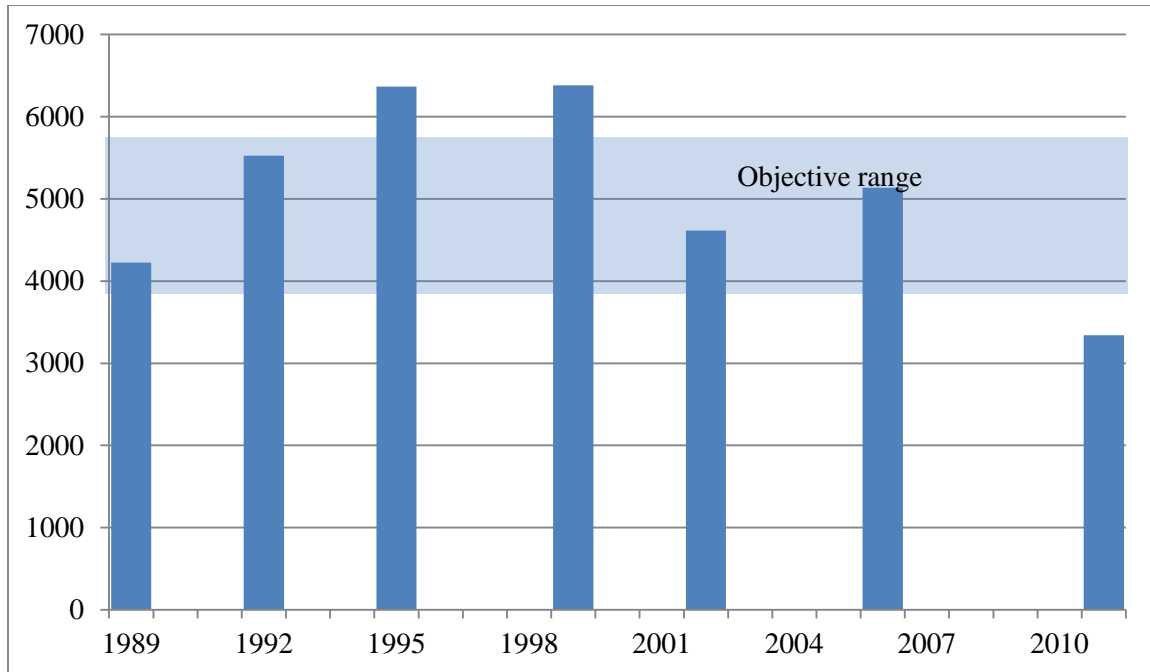


Figure 1. Total number of cow elk in the Middle Fork Zone, 1989-2011.

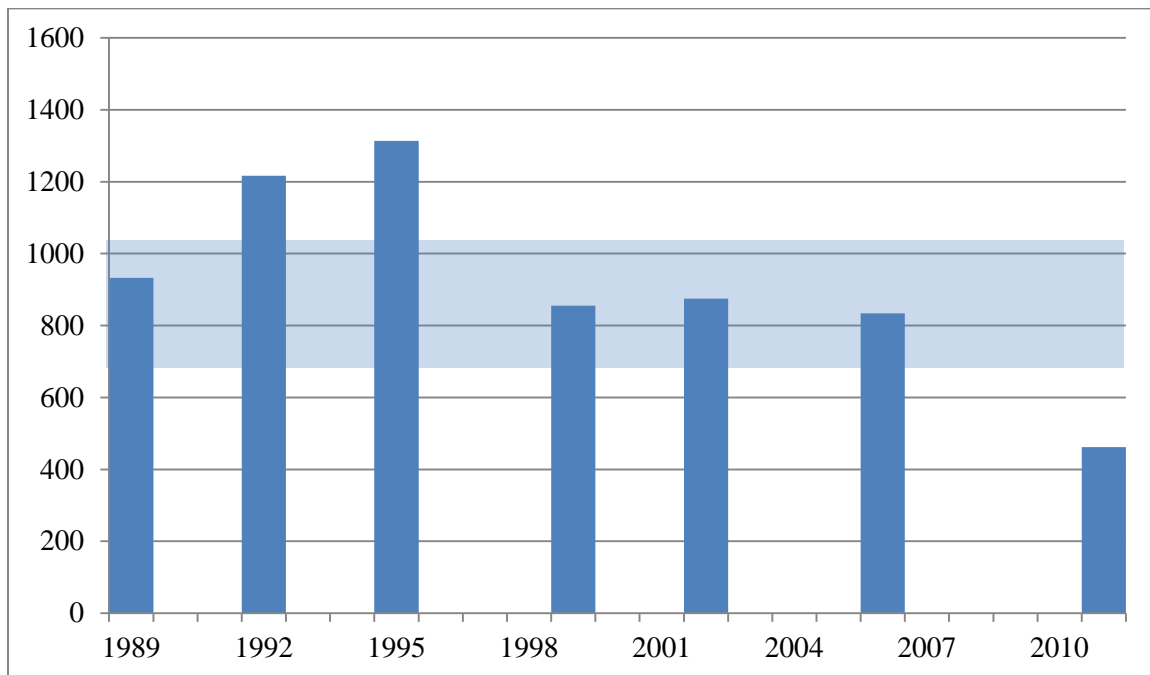


Figure 2. Total number of antlered elk in the Middle Fork Zone, 1989-2011. Prior to the adoption of the 2014-2024 Elk Management Plan, the population objectives for males was 950-1,550 and adult males was 600-900 (IDFG 1999). IDFG adjusted this objective to better reflect realistic potential for population growth over the scope of the 2014-2023 elk plan.

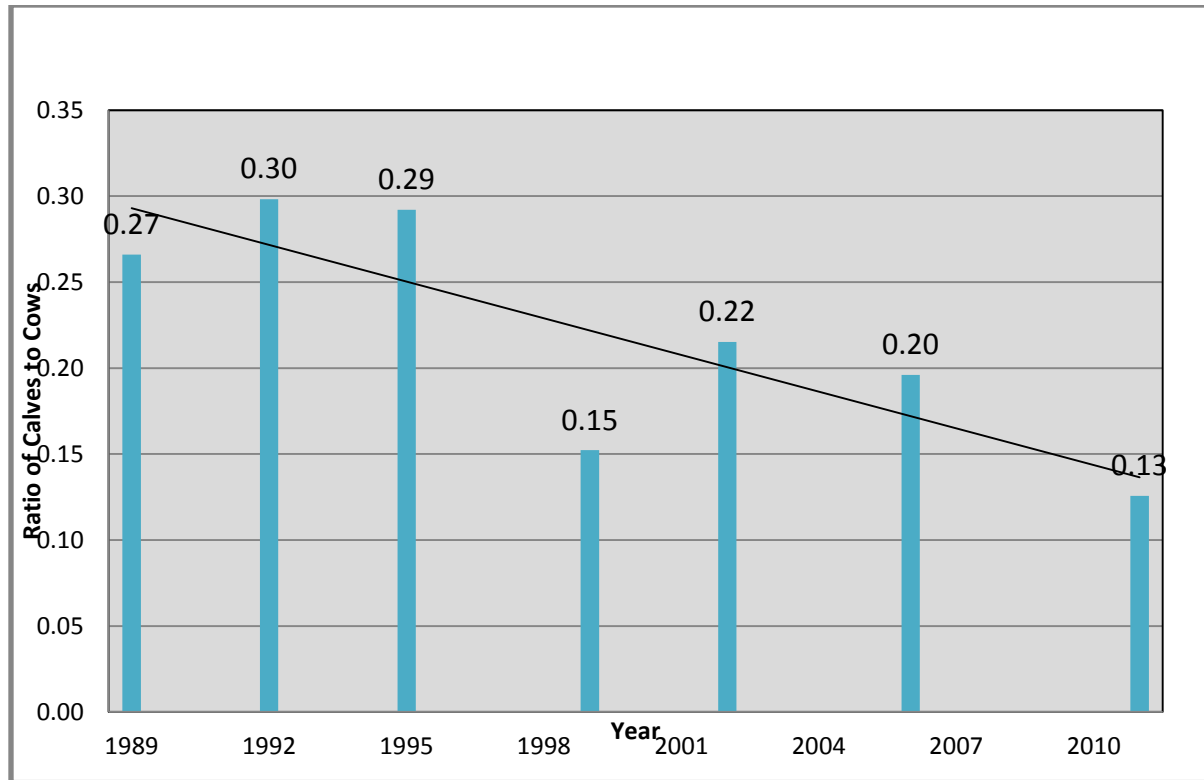


Figure 3. Juveniles:100 females in Middle Fork Elk Zone, 1989-2011.

Background – Middle Fork Elk

The Idaho Department of Fish and Game (IDFG) has defined some movement patterns of elk in the MFZ via radio-telemetry of elk calves. This information, combined with radio-telemetry studies of elk in the adjacent zones to the north and south of the MFZ, and historical observations within the MFZ, indicates that greater than 60% of elk in the MFZ remain resident within the zone, occupying higher elevation ranges during summer and moving to lower elevations along the Middle Fork Salmon River, main Salmon River and major tributaries during winter. Population objectives were established based on habitat potential, harvest opportunity, and moderate predation rates (IDFG 2014).

Habitat Potential

Pregnancy rates and body condition of females are indicators of carrying capacity (Murphy et al. 2011). In addition, forage quality and its effect on animal condition regulate elk population vital rates, and recruitment rates in particular (Cook 2002, Cook et al. 2004). Higher quality forage typically promotes higher recruitment rates, while in a habitat-limited situation, rates decline in response to lower or declining forage conditions.

Granitic and weathered volcanic formations underlying the MFZ provide fewer nutrients, and lower precipitation in the MFZ limits vegetative productivity. Similar to the situation in the Lochsa and Lolo areas (to the north), elk habitat quality in the MFZ has declined in general since

the 1980s through the early 2000s due to a lack of disturbance (fires), and has been a factor contributing to population decline.

Recent fires in the MFZ have provided some relief from long-term habitat declines. Perimeters of fires occurring since 2000 encompass >400,000 acres, accounting for roughly 20% of the area. In general, large-scale wildfires promote increased forage production and forage quality, particularly on summer ranges. A significant acreage of wildfire in the MFZ has occurred on winter and transition range; however, on some winter ranges there is potential for reduced forage quantity and quality as a consequence of increased prevalence of invasive noxious weeds and other species with lower or no nutritional value.

Annual Survival of Elk

Elk population growth rates are sensitive to adult female survival, and populations that are stable or increasing typically exhibit female survival rates $\geq 90\%$ (Eberhardt 1985). Cow survival rates averaged 81% in the nearby Lowman area, 2008-2012; and 83% in the North Fork Clearwater River drainage, 2009-2012 (Pauley et al. 2012, IDFG unpublished data 2014).

Poor juvenile survival also contributes substantially to population decline (Gaillard et al. 1998, Raithel 2005). The most recent mid-winter estimate of less than 13 calves per 100 cows is inadequate to maintain a population given observed cow elk survival rates. Female and juvenile elk survival rates appear inadequate to stabilize or provide growth of the elk population, preventing it from reaching management objectives within the MFZ.

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).

EFFORTS TO ADDRESS MIDDLE FORK ZONE ELK DECLINE

Changes in Elk Habitat

Most of the MFZ is comprised of the Frank Church River of No Return Wilderness and in federal ownership, managed predominately by the USFS. Habitat alteration in this area is largely in the form of natural disturbance such as wildfire. Approximately 20% of the MFZ has burned in wildfires since 2000. However, colonization of the Wilderness by invasive plant species in recent years is an important factor in the deterioration of elk habitat in some areas. IDFG will make recommendations regarding invasive plant control and other habitat-related issues to the USFS consistent with the directives of the 1980 federal wilderness designation and interagency

agreements. IDFG will also continue to evaluate appropriate measures for habitat management on the relatively small acreage of parcels it owns in the MFZ.

Changes in Elk Hunting Seasons and Harvest Strategies

In response to declines in elk numbers, especially bull elk, IDFG implemented caps on the A and B zone tags in the MFZ in 2000 and restricted take to a smaller segment of the elk population (only bull elk with at least a brow tine) in GMU 27 in 2001. Antlerless elk hunting was reduced over time and completely eliminated in the MFZ in 2011 (Table 2).

Table 2. Middle Fork Elk Zone harvest statistics, 2003-2012.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Antlerless harvest	110	73	78	119	78	42	67	57	0	0
'A' Tag	71	72	78	119	77	42	67	55	0	0
'B' Tag	39	1	0	1	1	0	0	2	0	0
CH Tag	0	0	0	0	0	0	0	0	0	0
Antlered harvest	309	307	355	419	296	295	250	158	145	155
'A' Tag	75	110	76	112	93	61	65	50	38	43
'B' Tag	234	197	279	307	203	234	185	108	107	112
CH Tag	0	0	0	0	0	0	0	0	0	0
Hunter numbers	1,878	1,841	1,678	1,611	1,512	1,752	1,511	1,133	821	757
'A' Tag	752	782	678	647	654	706	588	471	285	197
'B' Tag	1,126	1,059	990	964	858	1,046	923	662	536	560
CH Tag	0	0	10	0	0	0	0	0	0	0
6+ points (%)	39	36	47	43	40	42	49	56	44	50

Black Bear and Mountain Lion Populations and Harvest

Spring and fall bear seasons in the MFZ were relatively conservative in the late 1980s and early 1990s, consisting of a standardized season of April 15 to June 15 in spring and September 15 to October 31 in fall. Lion seasons ran from September 15 to March 31. Only 1 bear and 1 lion could be taken in a calendar year.

Between fall 1999 and spring 2001, the Commission made incremental changes to bear and lion seasons and bag limits to address declining elk recruitment in the MFZ. Bear seasons were expanded to August 30 to November 18 in fall and April 1 to June 30 in spring. Lion seasons were expanded to August 30 through April 30. Extra bear and lion tags were allowed, along with discounted non-resident bear and lion tags. Non-resident deer and elk tags could also be used on bear and lions.

These changes resulted in a doubling of black bear harvest by 2002, and black bear harvest has since remained at these higher levels. The management objective for bears in the MFZ (bear data analysis unit 3B) is to increase harvest from a light to moderate harvest regime (IDFG 1998). Despite the higher harvest levels since 2002, the bear population in the MFZ continues to exhibit characteristics of a lightly harvested population.

By contrast, mountain lion harvest demonstrated an initial increase, and then a declining trend in harvest after 2000. This pattern occurred simultaneously over most of Idaho. Potential factors include a reduced lion population driven by a declining prey base for this obligate predator, and a decline in participation by hound hunters (concerns with turning dogs loose in wolf country). Although alternate prey, primarily white-tailed (*Odocoileus virginianus*) and mule deer (*O. hemionus*), are available to lions in these GMUs, whitetails are uncommon and mule deer occur at moderate densities.

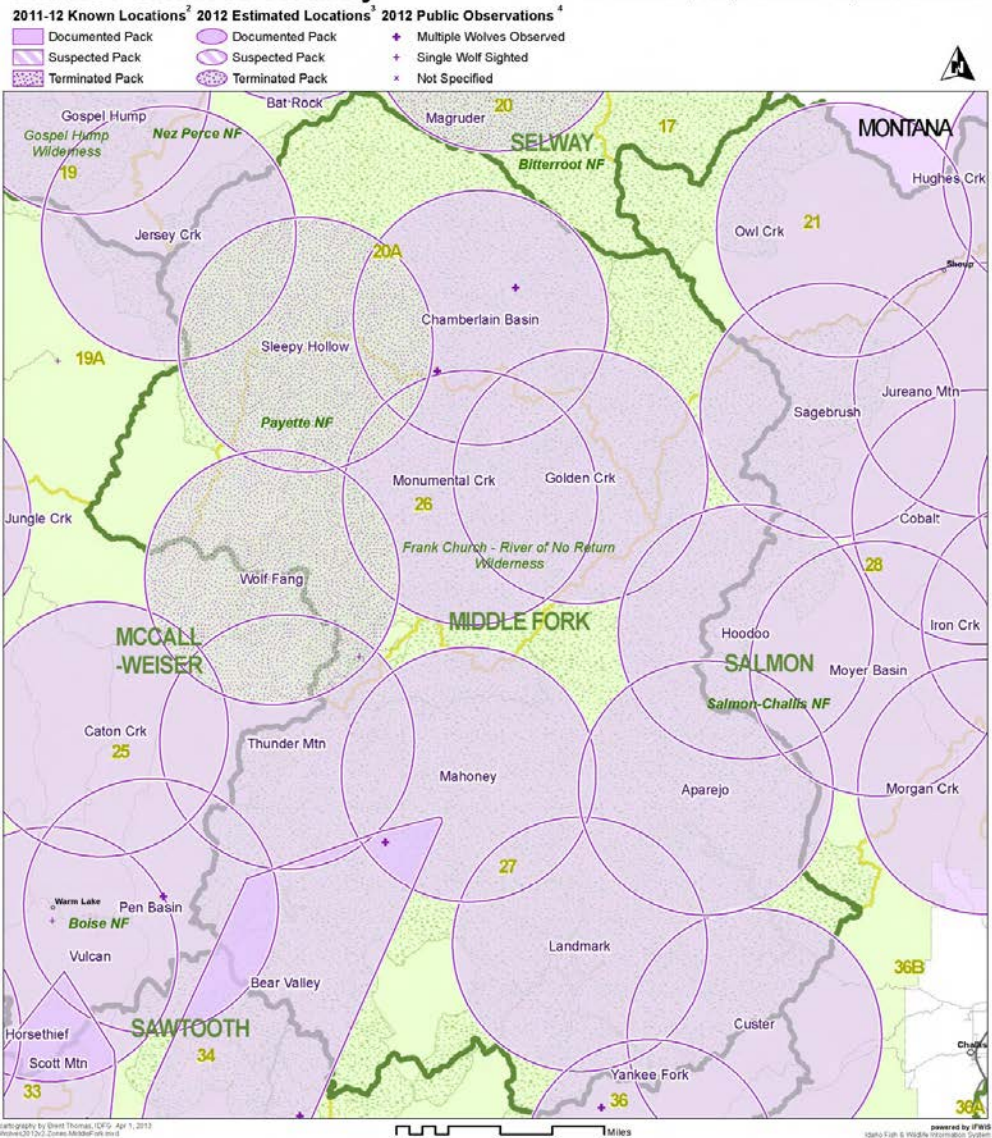
The current lion harvest (average of 10 lions/year, 2011 – 2013) is below the objective described in the Idaho Mountain Lion Plan (IDFG 2002) for a harvest of 15 or more lions annually from the Warren Data Analysis Unit, which also includes GMUs 19A and 25. This DAU includes some of the oldest mountain lions in Idaho, with 55% of the male harvest constituted of lions 5 years of age or older.

Wolf Population Size

Radio-telemetry, non-invasive genetic sampling, hunter observation and harvest information (e.g., location and number observed by hunters, location and age-class data obtained from harvested wolves) provide insight into pack activity in the MFZ. Based on this information, IDFG has documented 6 to 8 resident packs in the MFZ in recent years (2008 – 2012), and an additional 2-3 packs whose territories include significant area within the MFZ (Fig. 4). However, additional packs that have not been detected may use the MFZ, and annual minimum population estimates generated for such a vast and remote back-country area should be treated as conservative estimates.

Middle Fork Wolf Activity

Documented, Suspected and Reported Locations¹



Notes:
 1. This map provided for management purposes and should not be used for data analysis. Do not release these data to third parties without first contacting the Idaho Department of Fish and Game or the Nez Perce Tribe.
 2. Known Locations collected and analyzed by Idaho Department of Fish and Game, the Nez Perce Tribe, Montana Department of Fish, Wildlife and Parks, Wildlife Services, the University of Montana Cooperative Wildlife Research Unit and the National Park Service. Pack locations are 95% fixed mean minimum convex polygons of GPS telemetry, research observations and wolf mortalities for collared and uncollared animals from 1/1/2011 - 12/31/2012 with outliers removed. See wikipedia.org/wiki/home_range for more information on using minimum convex polygons to analyze animal movements. If the pack did not have any observations in 2012 it is not depicted on this map.
 3. Estimated Pack Activity determined by biologists from research locations, public observations and incidental observations from 1/1/2011 - 12/31/2012. These are displayed as 9.8 mile radius circles consistent with pack territories in Idaho.
 4. 2012 Public Observations collected on the Idaho Fish and Game website and reviewed by staff biologists. Confirmed and possible observations from 1/1/2012 - 12/31/2012 are displayed.

Figure 4. Approximate extent of detected wolf pack activity in the MFZ, 2011-2012.

The 2,884 mi² MFZ is large enough to accommodate approximately 12 wolf packs, based on an average territory size of 240 mi² (Ausband et al. *in review*). Given the range of 6 (minimum documented) to 12 (based on territory size) packs in the MFZ, management will initially be based upon the midpoint of 9 packs assumed present in the MFZ.

To comply with federal post-delisting monitoring requirements, IDFG develops a minimum population estimate for wolves by using information based on documented packs, estimated pack size, number of wolves documented in small groups not considered packs, and a percentage of the population expected to be lone wolves. The formula is presented as:

$$[(\# \text{ Wolves in known packs with complete counts}) + (\# \text{ Packs with incomplete counts} * \text{mean pack size}) + (\# \text{ Wolves in other documented groups})] * (\text{lone wolf factor})$$

This minimum population estimate is calculated at the end of the calendar year, during the hunting and trapping seasons. It is more useful to management, however, to calculate this estimate the following summer, after harvest has concluded and packs have demonstrated success in recruitment of pups.

Given a *summer* mean pack size of 9.2 wolves per pack (IDFG unpublished data 2012), an additional 12.5% lone wolf factor (see Holyan et al. 2013), 9 packs represent approximately 93 wolves present in the MFZ during summer.

Wolf Harvest

The state is divided into wolf zones based on current wolf densities and distribution, elk zones and prey base, livestock conflict areas, ecological or administrative similarities, and linkage concerns. The Middle Fork Wolf Zone is identical to the Middle Fork Elk Zone.

During the first Idaho wolf hunting season in 2009, IDFG developed harvest limits for individual wolf zones as well as a statewide limit. Seasons closed in individual zones when harvest limits were met, or the end of the established season date, whichever occurred first. A harvest limit of 17 was adopted for the MFZ for the 2009-10 season (this was reached January 31, 2010); no harvest limits were deemed necessary for subsequent years. Hunting and trapping are the primary causes of human-caused mortality in the MFZ (Table 3).

Table 3. Human-caused mortality in the MFZ since 2009-2010.

Biological Year ^a	Hunting	Trapping	Other Human-Caused Mortality ^c	Total
2009-2010	16	0	4	20
2010-2011	0	0	0	0
2011-2012	27	12	1	40
2012-2013	6	10	0	16
2013 - 2014 ^b	11	2	9	22

^a May 1 – April 30

^b Through January 31, 2014 only

^c Includes other legal kills, illegal kills, control actions, etc.

IDFG has incrementally increased wolf hunting and trapping opportunity under an adaptive framework consistent with Commission direction. The hunting season ran from 30 August through 31 March for the first 3 seasons and was extended to a 30 June closure beginning in 2013-14. Trapping was permitted 15 November to 31 March beginning with the 2011-12 season. Hunters and trappers can use up to 5 wolf tags in the MFZ (each method, plus hunting tags may be used for trapped wolves). Additionally, non-resident elk and deer tags may be used instead for taking a bear, lion, or wolf if that season is open.

PREDATION MANAGEMENT PROGRAM

PROPOSED ACTIONS

Regulated harvest by licensed hunters is IDFG's preferred tool for reducing black bears and mountain lions in the MFZ. IDFG will continue to support longer seasons and additional tags in the MFZ for managing bear and lion to improve elk survival. IDFG plans no additional actions beyond regulated harvest for bear and mountain lion management.

Regulated harvest by licensed hunters and trappers is IDFG's preferred tool for reducing wolves in the MFZ. When regulated harvest, despite changes to seasons, bag limits, and regulations, is insufficient to achieve wolf reduction in the MFZ, and consistent with the federal wilderness designation of most of the MFZ, IDFG will approach management from a "minimum tool" perspective, initially using one or more wilderness trappers on foot or horseback to remove wolves from the MFZ.

Wolf removal rates of 29% or less typically do not cause any short-term changes in wolf abundance (Adams et al. 2008). Wolf populations tend to compensate for low removal rates, potentially within a year. Where higher levels of removal occur and wolf populations decline, the wolf population would be expected to return to pre-removal levels rapidly once removals end (National Research Council 1997: Table 3.1). Consequently, after a wolf population is reduced to a desired level, it is necessary to sustain a removal level during subsequent years to maintain reduced wolf abundance. Proposed future management actions will be designed to maintain approximately 40% of the existing wolf population in the MFZ.

Wolf management in the MFZ is extremely challenging considering the remote country, rugged terrain, and limited access. Consequently, hunting and trapping pressure is lower than front country areas that are easier to access and travel. Any reduction in the MFZ wolf population will likely take longer than most other zones. Management will be necessarily adaptive, relying upon monitoring to determine the appropriate management. IDFG will monitor legal harvest and adjust future efforts accordingly.

OBJECTIVE AND MEASURES OF SUCCESS

The objective of the Predation Management Plan is to affect an increase in elk survival and elk numbers in the MFZ to move the population towards stabilization and eventual recovery. To achieve this objective, IDFG seeks to reduce predator populations without affecting their viability. IDFG will manage wolf numbers to 40% of the 2012 population, from a summer population of approximately 93 wolves to approximately 35-40 wolves. Success will be

measured by comparing elk status in relation to IDFG 2014 elk plan population objectives and consistency with species management plans for black bear and mountain lion, and the Idaho Wolf Conservation and Management Plan (Idaho Legislative Wolf Oversight Committee 2002).

MONITORING

Monitoring is a key component of any predation reduction 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. A zone-wide elk survey was conducted in the MFZ in 2011 and a subsequent survey is planned after 5 years, during winter 2016. Recruitment will be indexed through estimation of calf:cow ratios biennially.

BEARS AND MOUNTAIN LIONS

IDFG will monitor black bear, mountain lion, and wolf populations through required harvest checks and Big Game Mortality Report forms. These forms are required for each successful hunter and for other discovered mortality and provide detailed information for each individual animal harvested regarding animal age, sex, location, and condition. Forms for wolves also include information regarding observation of other wolves. Harvest checks involve the extraction of a tooth for aging, collection of DNA, and attachment of an identification tag to each pelt. These data provide population trends regarding male/female ratios and age class distribution of the harvest.

WOLVES

In addition to measures outlined above for bears and lions, IDFG will continue statewide monitoring of the wolf population to ensure compliance with post-delisting population criteria and monitoring requirements. IDFG will estimate a minimum number of wolves and breeding pairs on an annual basis from observations of unmarked and radio-collared packs, and wolf tracking and aerial surveys.

Depending on the efficacy of maintaining radio-collared animals in the MFZ, IDFG may also conduct non-invasive genetic surveys of historic and predicted rendezvous sites (Ausband et al. 2010) to assess pack presence, size, recruitment, and rate of (reported) human-caused mortality. Additional methods may include conducting howl box surveys to verify presence or absence (Ausband et al. 2011), using trail cameras to verify production, and linking harvest data to specific packs.

BUDGET

The funds required to implement actions in this plan are available as part of larger, ongoing IDFG programs. Aerial surveys as listed 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. Only license funds would be used for lethal removal of wolves in the MFZ.

RISK ASSESSMENT

PREDATOR POPULATION

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

Bear season changes and associated actions that were implemented previously were intended to increase bear harvest rates to meet a "moderate" harvest goal. However, "light" harvest rates continue to be documented, and the geographic ruggedness and isolation of this area may make a moderate harvest rate unattainable even with liberal hunting seasons.

Declines in elk numbers were followed by declines in numbers of mountain lions, which in turn led to lower hunter participation and harvest rates (White 2010). Lion harvest remains low and more liberal lion seasons are unlikely to reduce lion populations substantially.

As of December 31, 2012, there were ≥ 117 wolf packs and ≥ 35 documented breeding pairs in Idaho (Holyan et al. 2013). Of the 117 packs documented in 2012, 111 documented packs were completely outside the MFZ and would not be affected by actions authorized under this predation management plan. None of the 35 breeding pairs documented during 2012 would be affected by the proposed actions. More than 600 wolves reside in areas of Idaho outside the MFZ proposed action.

Of note, the MFZ was the site of the initial 35 wolves released in Idaho during 1995 and 1996. Idaho's current wolf population is the result of these releases, dispersal from releases in Wyoming the same years, and natural colonization from established populations in Montana and Canada. A majority of introduced wolves established territories outside the MFZ, and most wolves in Idaho currently exist outside the MFZ. Potential emigration from these areas into the MFZ and wolf population resiliency in general make it very unlikely that reductions proposed under this plan would present any significant short- or long-term risk to the persistence of wolves in the Frank Church River of No Return Wilderness, MFZ, or overall wolf population viability. Wolf population reduction in the MFZ will not affect the ability to maintain Idaho's wolf population well above the recovery criteria of 15 breeding pairs and 150 wolves statewide.

In summary, these described management efforts are intended to help improve elk survival in the MFZ and will not affect the viability of the resident wolf, bear, and mountain lion populations within the MFZ nor adjacent zones.

PREY POPULATIONS

Elk will be the primary species benefitting from the proposed actions in this plan. Mule deer, bighorn sheep, and other prey may benefit as well.

WILDLIFE-ASSOCIATED RECREATION OPPORTUNITY

Elk have been managed for hunting and viewing by the public since the 1950s in the MFZ. The participation in hunting peaked in the 1990s as elk reached population levels that were meeting or exceeding IDFG objectives. Since that time, calf recruitment has steadily declined along with the total elk population. IDFG has substantially reduced elk hunting opportunity in the MFZ since 2000. During the past 10 years, the number of elk hunters in the MFZ declined from 2,105 to 797, a loss of 62% participation.

Implementation of actions designed to reduce impacts of predation on elk may result in a subsequent increase in opportunities for sportsmen and for other wildlife-associated recreationists whose focus is elk. The continued presence of wolves, black bear, and mountain lions in this area also provides an opportunity for hunting, trapping (in the case of wolves), and viewing (directly or indirectly), which maintains the wilderness character and values of the MFZ. These opportunities will continue in a sustainable fashion as IDFG manages predation on elk consistent with the objectives of this plan.

MANAGEMENT ACTIONS IN FEDERALLY-DESIGNATED WILDERNESS

Most of the MFZ lies within the federally designated Frank Church River of No Return Wilderness. IDFG will consider the values underlying the Central Idaho Wilderness Act of 1980 as they apply to its actions in the Frank Church River of No Return Wilderness. IDFG will also evaluate the “minimum tool” concept for performance of additional agency actions in the Frank Church River of No Return Wilderness, should they be needed to reach population objectives under this plan.

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