Idaho Department of Fish and Game Predation Management Plan
For the Lolo and Selway Elk Zones
Revised December 13, 2011

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INTRODUCTION

A "Policy for Avian and Mammalian Predation Management" was adopted by the Idaho Fish and Game Commission (Commission) in August 2000 (see Appendix 1). This policy identifies a protocol whereby a predation management plan must be written when certain conditions are met and problems are identified. As directed by the policy, the Predation Management Plan for the Lolo and Selway Elk Zones in the Clearwater Region has been reviewed and revised regularly. This management plan identifies ongoing efforts to reduce adverse impacts of factors influencing the Lolo and Selway elk populations and identifies approaches to monitor the effects of predator-caused reductions. Actions will be taken in conjunction with state management plans for individual species (wolf, bear, mountain lion, and elk) to ensure species management objectives are met.

DEFINITION OF PROBLEM

Elk numbers are currently well below management objectives in the Lolo and Selway Zones. Since the early to mid 1990s, elk calf to cow ratios have continued to decline, and have been at levels too low to sustain elk populations. More recently, cow survival rates have also declined to problematic levels. A number of factors have been identified as contributors to this situation. Declining habitat conditions caused by a shift from early forest seral stages to much less productive mid to late seral stages have been a source of concern for decades. More recently, the spread of noxious weeds (especially spotted knapweed) has also contributed to the decline in elk habitat quality. A major winter event in 1996-97, with record snowfall more than 200% of normal, caused a severe winter die-off that resulted in a population decline. White et al. (2010) documented heavy predation on neonate elk calves by black bears as additive and the primary proximate mortality factor of neonate calves (age $\leq$ 90 days). Additionally, predation by mountain lions was prevalent on all age classes of elk (Zager et al. 2007a, Zager et al. 2007b, White et al. 2010). Currently wolves, which were not present during the early portion of this elk decline, are a major mortality factor on older calves ($\geq$6-month old) and cow elk (Zager et al. 2007b, Pauley et al. 2009). Lower cow and calf survival due to wolves is continuing to suppress the elk population (Pauley et al. 2009, Pauley and Zager 2011).

Elk Population Management Objectives and Current Status

Elk abundance objectives were established in the current elk management plan (Kuck 1999). The management objectives in the Lolo Zone (Game Management Units [GMUs] 10 and 12) are to maintain an elk population consisting of 6,100 – 9,100 cow elk and 1,300 – 1,900 bull elk. Objectives for the Selway Zone (GMUs 16A, 17, 19, and 20) are 4,900 – 7,300 cow elk and 1,325 – 1,925 bull elk. The cow and bull elk abundance objectives for these zones were established at levels to allow growth and recovery of these depressed populations over time.

These objectives were set to levels believed to be sustainable by Lolo and Selway zone elk habitat.

The most recent sightability survey in the Lolo Zone (2010) revealed 1,358 cow elk and 594 bull elk. Thus, bull elk and cow elk were well below objectives in 2010. In the Selway Zone survey (2007), the 3,381 cow elk and 934 bull elk estimated also fell below management objectives.

History of Elk Population Decline

The Lolo and Selway elk zones are composed primarily of public lands (97%) managed by the USFS. Habitat conditions in this portion of the Clearwater Region that had contributed to increasing elk populations in the past were a result of extensive fires that covered the majority of these units early in the century. Conditions favorable to elk likely peaked 10 - 40 years following the fires of 1937, and slowly declined after that. Brush fields slowly grew up and noxious weeds such as spotted knapweed started to become established on winter ranges in these two zones, reducing the quality of the habitat for elk. Not only did food become more limiting for elk during winter, but the extensively overgrown brush fields in calving areas may have allowed predators to be more effective.

These areas traditionally had high levels of habitat disturbance. Intense wildfires were prevalent in the early 1900s over much of the landscape. Also, in the early 1900s, blister rust decimated western white pine (*Pinus monticola*) stands, one of the dominant species. Subsequent fire suppression eliminated much of the natural disturbance once part of the system. This created a landscape that is dominated by mid-succession forest lacking early seral stages. Historically 35% to 45% of the landscape was early seral stage, compared with 14% currently (USDA Forest Service 1999). Similar trends likely occurred in the Selway. Much of recent disturbance in the Lolo Zone has come in the form of logging (which peaked in the 1970's and 1980's and has since declined to low levels) rather than wildfire.

The Lolo Zone elk population peaked in 1989 at an estimate of 16,054 elk (IDFG, unpublished data) and subsequently declined sharply due to low calf recruitment. This was followed by the winter of 1996-97, when a record snowfall (200% of normal) occurred. Many elk died as a result of the deep snow and persistent winter conditions. Very low calf to cow ratios were evident for several years following the record winter.

Concerns over persistent low calf recruitment prompted the initiation of a research study in the Lolo Zone in 1997. Research findings revealed low calf recruitment was a function of low calf survival. The proximate cause of neonate (age $\leq$ 90 days) calf mortality was from black bears and mountain lions (White et al. 2010). Calf mortality from black bear predation was additive and manipulation of black bear densities through increased harvest resulted in higher calf survival (White et al. 2010). Additionally, elk calves with lower birth weight, which is typically tied to habitat condition, were likely pre-disposed to predation (White et al. 2010). After wolves had become well established in the Lolo zone, efforts to measure adult cow elk mortality and older ($\geq$ 6-month) calf mortality between mid-December and June 1 revealed high mortality rates, largely caused by wolf predation (Zager et al 2007b, Pauley et al. 2009, Pauley and Zager 2011). For instance, during 2005-2007 and 2009-2010, >90% of known-

cause deaths of radio-marked cow elk were due to predation, of which 76% (37 of 49) were caused by wolves. During this same time period >88% of known- cause deaths of radio-marked older calves were due to predation, of which 73% (22 of 30) were caused by wolves. Of all calf and cow predator-related deaths, wolves were the primary cause for 75% (IDFG, unpublished data; Pauley and Zager 2011)

Clearly, several factors have contributed to these declining elk populations. At various times and at different population levels, these various factors have (and continue to) exert varying levels of impact. However, at the present time and at current elk population status, wolf-caused mortality is the major factor limiting calf recruitment and cow elk survival and, therefore, elk abundance and achievement of Idaho Department of Fish and Game (IDFG) objectives. These same factors are believed to be driving elk populations in the Selway Zone.

Efforts to Address Lolo and Selway Zone Elk Declines

Efforts to Improve Elk Habitat

IDFG's primary habitat management influence has been through collaboration with the USFS and interested publics to address habitat concerns. The focus has been to increase fire frequency through prescribed fire and more liberal "let burn" policies. IDFG has also actively encouraged efforts to control noxious weeds and to close roads to improve elk habitat effectiveness and harvest vulnerability. IDFG has been involved in several collaborative efforts focused on manipulating habitat to favor elk. These have included the Clearwater Basin Elk Habitat Initiative (1998), the Clearwater Elk Summit (2003), and the Clearwater Elk Collaborative (2003).

Some of the recommendations that were developed from these efforts have been implemented or have been incorporated into planning for future projects. From 2006 to 2009, 50,911 acres were burned from prescribed fire in many areas of the Clearwater and Nez Perce national forests. Additional acres are scheduled for prescribed fire over the next 3 to 4 years and additional burn areas will likely be added in the near future.

Changes in Elk Hunting Seasons

The first major changes in hunting seasons to reduce bull elk harvest were implemented in 1992. Prior to 1992, GMUs in the Clearwater Region were open to hunting by all regular season tag holders. Beginning in 1992, hunters were required to choose to hunt in either the less accessible Mountain units or in the remaining, more accessible units. In the Clearwater Region, GMUs in the Lolo and Selway Zones were managed in the Mountain Group. This season structure change was implemented to reduce hunter densities. In addition, the opening day of rifle hunting season in GMUs 10 and 12 was moved back to October 10 to move the rifle season out of the rut. These changes reduced general hunt bull harvest within the Mountain Group GMUs in the Clearwater by 45% between 1992 and 1993. Harvest decreased from 2,037 bulls in 1992 to 1,116 in 1993 and the number of hunters declined from 8,944 to 5,093 (-43%) while hunter success remained stable (Kuck 1994).

The next major change in season structure came in 1998 with the completion of a new elk management plan. A zone system with an A-tag and B-tag structure was implemented in the 1998 hunting season. This grouped GMUs 10 and 12 into the Lolo Zone and 16A, 17, 19, and 20 in the Selway Zone.

In the Lolo Zone, the A-tag offered an early archery season for any elk August 30 to September 30 with unlimited tags available. The B-tag offered an any-weapon hunt for an antlered elk from October 10 to November 3. B-tag numbers were capped at 1,600, which represented a 50% reduction in rifle season bull elk hunters. With the implementation of the zone system in 1998, the controlled hunts for cows were eliminated in GMUs 10 and 12. It should be noted that antlerless harvest in the Lolo Zone under the A-tag has been minimal. Harvest has varied between 2 and 20 animals, averaging 7.5 antlerless elk/year from 1998-2005; antlerless elk hunting opportunity was eliminated in 2006. IDFG further reduced hunting opportunity for elk for the 2010 season by lowering the Lolo B-tag quota by 32% and by placing a quota on the A-tag (404 tags). This action followed the results of the 2010 elk survey that indicated continued declines in elk numbers and was in addition to large reductions in hunter numbers previously implemented. The overall result since 1998 to the present is that tags have been reduced from 5,672 to 1,492 (74% reduction) in response to declining elk populations.

In the Selway Zone, both the A-tag and B-tag hunts are any weapon, antlered-only hunts. The A- tag hunt runs from October 1 to October 30 and tags are available in unlimited numbers. The B- tag dates are September 15 through September 30 and November 1 through November 18; B-tag numbers were capped at 1,255 in 2000. Antlerless controlled hunts were eliminated in 1996, and in 1999 general season antlerless harvest was eliminated. Declines in elk estimated from the 2007 survey, prompted reductions in the B-tag quota to 1,067 and the season length by 7 days; the A-tag limit was set at 647 tags. The overall result since 1998 to the present is that tags have been reduced from 3,472 to 1,714 (51% reduction) in response to declining elk populations.

The net effect of these season changes and declining elk numbers in the Lolo Zone has been a reduction from 65,472 hunter days (1988) to 6,648 (2010) and a change in harvest from 2,184 bulls (1988) to 124 (2010). Current hunter days represent only 10% of 1988 levels, while current bull elk harvest is 6% of that observed in 1988. Similarly, the effect in the Selway Zone was a decline in hunter days from 39,814 in 1988 to 7,831 (-80%) hunter days in 2010. Harvest in the Selway Zone fell from 837 bulls in 1988 to 142 (-83%) in 2010 (Kuck 1994, Rachael 2011).

Changes in Black Bear and Mountain Lion Hunting Seasons

The Lolo and Selway zones have a history of liberal black bear and mountain lion seasons. The use of dogs and baiting has been allowed for hunting bears, and female mountain lion harvest has not been restricted by quotas. In the mid-1990's, longer take seasons were implemented for both species.

Beginning in the fall of 1999, and in subsequent years, a series of changes to bear and mountain lion seasons was implemented in response to concerns over poor elk calf recruitment rates. These changes have included establishment of a 2-bear and 2-mountain lion bag limit, a

reduction in nonresident tag prices, an increase in nonresident hound hunter permit levels, approval for use of nonresident deer tags for harvest of a bear or lion, and use of electronic calls for hunting lions. Additionally, coordination with the Idaho Outfitters and Guides Board and the USFS, led to the development of a process by which outfitters could operate within neighboring outfitters' areas (outfitter area overlap) to increase harvest of black bears and mountain lions.

These changes resulted in a doubling of black bear harvest by 1998, and black bear harvest has since remained at higher levels than in previous years. The liberal black bear season framework remains in place to date. By contrast, mountain lion harvest demonstrated an initial increase, particularly in GMU 12, and then a declining trend in harvest post 2000. This is more likely a population response driven by a declining prey base for this obligate predator, a decline in participation by hound hunters (concerns with turning dogs loose in wolf country), and the effects of snow conditions on access and effective tracking rather than a response to season changes. Although alternate prey, primarily whitetail and mule deer, are available to lions in these GMU's, these prey species are found at low densities.

Initial Wolf Hunting Seasons

Following delisting of the wolf in Idaho in 2009, the Commission authorized Idaho's first wolf hunting season with zone-specific harvest limits and a statewide harvest limits for 2009-2010 of 220 wolves. The wolf season for the Lolo Zone ran from 1 September to 31 March with a harvest limit of 27 wolves with an additional 12 wolves allocated to the Nez Perce Tribe; the Selway Zone season ran from 15 September to 31 March with a harvest limit of 17 wolves with an additional 7 allocated to the Nez Perce Tribe. No tribal harvest was reported. Neither zones wolf sport harvest limit was met during the 2009-2010 season (Lolo: 13 wolves; Selway: 11 wolves). Despite long seasons, sport harvest was insufficient to reach wolf harvest goals for the zones. Contributing factors affecting wolf harvest rates included difficult access for hunters, rugged, forested terrain, and less than ideal weather conditions to bring wolves to lower, more accessible areas. The wolf hunting season for 2010-2011 was suspended when wolves were relisted in August 2010. This was followed by Congressional action that delisted wolves in Idaho and Montana in spring 2011. As a result, the Commission set wolf hunting seasons for the 2011-2012 seasons at their July meeting. Seasons for both the Lolo and Selway zones were set to run from 30 August to 30 June with no harvest limit. Idaho's first wolf trapping seasons were also established to run from 15 November to 31 March in these zones.

RISK ASSESSMENT

Predator Populations

The reduction in predators will be limited to black bear, mountain lions, and wolves under this plan.

Bear season changes and associated actions that were implemented under the previous version of this plan were intended to increase bear harvest rates to meet a "heavy" harvest goal. However, only "light" to "moderate" harvest rates have been achieved (White 2010a). Liberal

harvest opportunities will continue to be offered to bear hunters and these are not expected to put bear populations in these zones at risk.

Even with liberal lion hunting seasons, lion harvest appears to be self-regulating in these zones. Declines in elk numbers has been followed by declines in the numbers of mountain lions which has in turn led to lower hunter participation and harvest rates (White 2010b). Lion harvest remains low and does not appear sufficient to put lion populations at risk.

As of December 31, 2010, there was a minimum of 87 wolf packs and 46 documented breeding pairs in Idaho (Holyan et al. 2011). Of the 87 packs documented in 2010, 78 are completely outside the Lolo and Selway Zones and would not be affected by actions authorized under the predator management plan. Of the 46 breeding pairs documented during 2010, 38 are completely outside of the Lolo and Selway Zones and would not be affected by the proposed actions. More than 595 wolves, out of the minimum estimated for Idaho at the end of 2010, would be outside the Lolo and Selway Zones proposed action.

Wolf removal rates of 30-35% or less typically do not cause any long-term changes in wolf abundance, while sustained removals of 40% or more may cause long-term reductions (Gasaway et al. 1983, Keith 1983, Peterson et al. 1984, Peterson and Page 1988). However, wolf populations have sustained human-caused mortality rates of 30 to 50% without experiencing declines in abundance (Keith 1983, Fuller et al. 2003). Gasaway et al. (1983) found wolf abundance was unchanged with 16-24% harvest, but declined 20-25% after harvests of 42-61%. Wolf populations tend to compensate for low removal rates and return to pre-removal levels rapidly, potentially within a year. Once removals end, the wolf population would be expected to return to pre-removal levels rapidly (National Research Council 1997: Table 3.1). Consequently, once a wolf population is reduced to a desired level, it is necessary to remove wolves during subsequent years to maintain reduced wolf abundance.

This localized wolf reduction effort will be a positive step toward improving elk survival in two very important elk management zones and will not affect the ability to maintain Idaho's wolf population well above the recovery management objective of 15 breeding pairs and 150 wolves.

Prey Populations and Other Species

Elk will be the primary species benefitting from the proposed actions in this plan. Predation continues to be a major factor influencing the survival of elk in the Clearwater backcountry. Other prey species will benefit as well, including moose, whitetail deer, and mule deer. Also, wolf reductions may have some indirect consequences for bears that may have fewer opportunities to usurp or scavenge wolf kills. Lions on the other hand, may benefit from a reduction in competition with wolves for prey in addition to lower mortality rates from wolf-related deaths.

Sportsmen and Wildlife-Associated Recreational Opportunity

Sportsmen and sporting groups were among the first to voice their concerns regarding the impacts of predation on elk populations in the Clearwater Region. Loss of opportunities to

hunt generous populations of elk has generated considerable input from the hunting public regarding both the cause of reduced opportunities, as well as potential solutions to bring about reversal of the trend. This input has not been limited to ways to maintain adequate populations of ungulates for hunting, but has also included concerns with the deleterious effects on predator populations as well.

Current levels of opportunity for hunting and viewing elk are substantially reduced from that available in years past. Implementation of actions designed to reduce the impacts of predation on elk will, over time, result in a subsequent increase in opportunities for sportsmen and for other wildlife-associated recreationists whose focus is this species. It is expected that the actions under this plan will be favored by many groups such as Rocky Mountain Elk Foundation, Idaho Outfitters and Guide Association, Idaho Anti-Wolf Coalition, and livestock producer groups such as the Idaho Cattle Association and the Idaho Woolgrowers Association. By contrast, those recreationists whose focus is to view wolves in the wild may experience some additional difficulty in achieving that goal due to decreased wolf numbers or changes in behavior. The same groups that opposed wolf delisting, such as Defenders of Wildlife, Earth Justice, Natural Resources Defense Council, Sierra Club, Humane Society, and Friends of the Clearwater are likely to oppose the actions proposed under this plan.

Landowners In or Near the Impacted Area

Nearly all of the Lolo Zone (2,355 square miles) and the Selway Zone (2,542 square miles) are in Federal ownership. Lolo Zone ownership is 95% USFS, of which 14% is wilderness, and 1% State and 4% private timber company land; the Selway Zone is more than 99% USFS, of which 79% is wilderness, and has <1% private lands. Actions proposed in this plan are not expected to impact these landowners.

PROGRAM

Boundaries

Efforts to reduce the numbers of black bears, mountain lion, and wolves addressed in this predation management plan will be limited to the Lolo Zone (GMUs 10, 12) and the Selway Zone (GMUs 16A, 17, 19, 20) (see Figure 1).

Methods

Sport harvest is IDFG's primary tool for predator reduction in the Lolo and Selway zones. IDFG may authorize agency control actions on predators where hunter harvest does not sufficiently reduce predation impacts

Liberal black bear and mountain lion hunting opportunities will continue to be offered through longer seasons, higher bag limits, reduction in nonresident tag prices, increase in nonresident hound hunter permit levels, approval to use nonresident deer tags for harvest of a bear or lion, and most recently the use of electronic calls for hunting bear and lion. Liberal wolf hunting opportunities will continue to be offered through longer seasons and larger harvest limits for

these zones compared with others. Relatively restrictive harvest methods for wolves have not been sufficient to achieve removal rates.

IDFG will use an adaptive strategy to reduce the wolf population in the Lolo and Selway zones. Wolf numbers will be reduced to manage elk populations toward stabilization and eventual recovery as measured by IDFG elk population objectives (Rachael 2011). The initial step in this strategy began with a 7-month season (September 2009 – March 2010) with regulated sport harvest limits of 27 and 17 wolves in the Lolo and Selway zones, respectively, and an estimated tribal allocation. Both hunting and trapping seasons have been set for 2011-2012. Harvest will be monitored as the season progress, but the desired removal rates are not expected to be achieved in these zones, and IDFG will consider additional measures to decrease wolf numbers.

Objective and Measures of Success

The objective of the Predator Management Plan is to affect an increase in elk numbers in the Lolo and Selway zones to move these populations toward stabilization and eventual recovery by reducing predator populations. Success will be measured by comparing elk status with IDFG elk population objectives (Rachael 2011).

Monitoring

Progress toward the elk plan objectives will be evaluated by monitoring changes in elk abundance, trends in abundance, and mid-winter recruitment rates measured with aerial surveys using the sightability survey approach (Unsworth et al. 1994). A zone-wide elk sightability survey was conducted in 2010 in the Lolo Zone and a survey will be conducted in 2013 in the Selway Zone. Timing of future surveys will follow IDFG's big game survey schedule. As part of the Statewide Ungulate Ecology Research Study, smaller scale sightability surveys (encompassing the GMU 10 study area) begun in 2009 will be conducted during years that zone- wide surveys are not scheduled (Pauley et al. 2007). Additionally, this research effort will provide measures of calf elk survival from mid-December through May and annual cow survival from radio-collared elk.

Harvest rates of bears, mountain lions and wolves will be monitored through the standard process of completion of Big Game Mortality Report Forms by each successful hunter. These forms provide detailed information for each individual animal harvested and are accompanied by extraction of a tooth for aging and attachment of an identification tag to each pelt.

Initiation of Predator Reductions

Efforts to reduce bear and lion numbers in the Lolo and Selway zones will continue as they have for the past several years. Wolf reductions were initiated with the implementation of the 2009- 2010 wolf hunting season and is continuing with the 2011-2012 season. Further removal measures are planned to achieve additional wolf reduction.

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 though statewide ungulate monitoring budgets. The GMU 10 research study is a component of current long-term research being conducted by IDFG's elk research staff. Funds for these efforts come from combination of federal wolf appropriations and Pittman-Robertson funds, and IDFG license dollars. IDFG has requested a $100,000 enhancement in the FY 2013 budget in preparation for future efforts associated with this and other predation management efforts.

LITERATURE CITED

Fuller, L., D. Mech, and J. F. Cochrane. 2003. Wolf population dynamics. Pages 161-191 *in* L. D. Mech and L. Boitani, editors. Wolves: behavior, ecology, and conservation. University of Chicago Press, Chicago, Illinois, USA.

Gasaway, W. C., R. O. Stephenson, J. L. Davis, P. E. Sheppard, and O. E. Burris. 1983. Interrelationships of wolves, prey, and man in interior Alaska. Wildlife Monographs 84.

Holyan, J., K. Holder, J. Cronce, and C. Mack. 2011. Wolf concervation and management in Idaho: progress report 2010. Nez Perce Tribe Recovery Project, P.O. Box 365, Lapwai, Idaho, USA.

Keith, L. B. 1983. Population dynamics of wolves. Pages 66-77 *in* L. N. Carbyn, editor, Wolves in Canada and Alaska. Canadian Wildlife Service Report.

Kuck, L. (compiler). 1994. Statewide Surveys and Inventory: Elk. Progress Report, Project W-170-R-18, Study 1, Job 1. Idaho Department of Fish and Game, Boise.

Kuck, L. (project leader). 1999. Idaho Elk Management Plan. Idaho Department of Fish and Game, Boise, USA.

National Research Council. 1997. Wolves, bears, and their prey in Alaska. National Academy Press, Washington, D.C., USA.

Pauley, G., M. Hurley, C. White, and P. Zager. 2007. Statewide ungulate ecology study plan: Effects of wolf predation on elk survival. Idaho Department of Fish and Game, Boise, USA.

Pauley, G., M. Hurley, C. White, and P. Zager. 2009. Effect of wolf predation on elk demographics in the Lolo elk management zone, Idaho. Abstract of the Idaho Chapter of The Wildlife Society Annual Meeting, 10-12 March, Moscow, Idaho, USA.

Pauley, G. R., and P. Zager. 2011. Study II: Effects of wolf predation on elk populations. Pages 38-47 *in* B. B. Compton, compiler and editor. Job Progress Report. Project W-160-R-37. Idaho Department of Fish and Game, Boise, USA.

Peterson, R. O., and R. E. Page. 1988. The rise and fall of Isle Royale wolves, 1975-1986. Journal of Mammalogy 69:89-99.

Peterson, R. O., R. E. Page, and K. M. Dodge. 1984. Wolves, moose, and the allometry of population cycles. Science 224:1350-1352.

Rachael, J. 2011. Elk. Job Progress Report. Project W-170-R-34, Study I: Big game population status, trends, use, and associated habitat studies. Idaho Department of Fish and Game, Boise, USA.

Unsworth, J. W., F. A. Leban, D. J. Leptich, E. O. Garton, and P. Zager. 1994. Aerial Survey: User's Manual. Second edition. Idaho Department of Fish and Game, Boise, USA.

USDA Forest Service. 1999. BHROWS Assessment: North Fork Big Game Habitat Restoration on a Watershed scale – Watersheds within the North Fork Clearwater River Subbasin. Clearwater National Forest, Orofino, Idaho, USA.

White, C. 2010a. Black Bear. Job Progress Report. Project W-170-R-33, Study I: Big game population status, trends, use, and associated habitat studies. Idaho Department of Fish and Game, Boise, USA.

White, C. 2010b. Mountain Lion. Job Progress Report. Project W-170-R-33, Study I: Big game population status, trends, use, and associated habitat studies. Idaho Department of Fish and Game, Boise, USA.

White, C. G., P. Zager, and M. Gratson. 2010. Influence of predator harvest, biological factors, and landscape elk calf survival in Idaho. Journal of Wildlife Management. 74(3): 355-369.

Zager, P., C. White, and G. Pauley. 2007a. Elk ecology. Study IV. Factors influencing elk calf recruitment. Idaho Department of Fish and Game Federal Aid in Wildlife Restoration Completion Report W-160-R-33, Boise, USA.

Zager, P., C. White, G. Pauley, M. Hurley. 2007b. Elk and predation in Idaho: Does one size fit all?, Transactions of the North American Wildlife and Natural Resources Conference 72:320-338.

APPENDIX 1. Policy for Avian and Mammalian Predation Management.

ADOPTED AUGUST 24, 2000

I. **PURPOSE**

The Idaho Department of Fish and Game (Department) has a responsibility to preserve, protect, perpetuate and manage all wildlife in the state and to provide continued supplies of such wildlife for hunting, fishing and trapping. To fulfill its responsibility, the Department must efficiently and effectively manage populations of predators as well as populations of prey species to meet management objectives. The Department recognizes predator management to be a viable and legitimate wildlife management tool that must be available to wildlife managers when needed. However, the Department also recognizes that predator removal is controversial both publicly and professionally. The purpose of this policy is to provide the Department direction in managing predator populations consistent with meeting management objectives for prey species populations.

This policy does not apply to emergency response situations where the Department must act to protect human health and safety.

II. **DEFINITIONS**

A. "Predation" means the act of an individual animal killing another live animal.

B. "Predator" means any wild animal species subsisting, wholly or in part, on other living animals captured through its own efforts. Predators are defined in Idaho Code as 'big game animals' (black bear and mountain lion), 'migratory birds' (American crow), 'fur- bearing animals' (badger, bobcat, fisher, marten, mink, otter, raccoon, and red fox), and
'predatory wildlife' (coyote, skunk, and weasel). For the purpose of this policy, "predator" will include primarily those avian and terrestrial species subject to Idaho jurisdiction, but may in some cases include species which are protected under the Migratory Bird Treaty Act or the Endangered Species Act. For predatory species protected under these or other federal statutes, the Department may cooperate with the USDA Animal and Plant Health Inspection Service and/or the U.S. Fish and Wildlife Service in addressing predation problems caused by such species.

C. "Predation management" means the application of professional wildlife management technology to increase or decrease predator populations. Predator management may include management of habitats to benefit or depress populations, selective harvest of individual animals, or generalized harvest over a geographic area.

D. "Predator removal" means the physical removal of an animal, alive or dead, from an area where its presence is undesirable. Physical removal of live animals for release in habitats already occupied by the same species has been shown to create additional problems as individual animals seek living space (i.e., a home range) within already-occupied suitable habitat; for that reason, predator removal will often but not necessarily require lethal methods.

E. "Prey" means any animal hunted or killed as food by a predator.

III. **POLICY**

Predator populations, as with all wildlife in Idaho, will be managed to assure their future recreational, ecological, intrinsic, scientific, and educational values, and to limit conflicts with human enterprise and values. Where there is evidence that predation is a significant factor inhibiting the ability of a prey species to attain Department population management

objectives and the Department decides to implement predation management actions, the management actions will ordinarily be directed by a predation management plan.

Predator populations will be managed through habitat manipulation and/or predator removal as appropriate. Wildlife managers and administrators implementing predation management options will consider the ecological relationships that will be affected. Management decisions will be consistent with objectives or management plans for predators, animals that constitute or contribute to the predator's prey base, affected habitat, and other biological and social constraints.

Idaho Code provides that predatory wildlife (i.e., coyotes, jack rabbits, skunks, starlings, raccoons and weasels) may be taken by any legal means at any time.

On lands managed by the Department, efforts to limit the size of predator populations may include habitat manipulation. The Department may encourage other land management agencies to manipulate habitat under their jurisdiction in a manner to limit the size or effectiveness of predator populations.

The Department, when and where feasible, will rely on sportsmen (licensed hunters and trappers) to take predators classified as game animals and fur-bearing animals, and may alter seasons or harvest rules to meet wildlife management objectives. However, the Department will not support any contests or similar activities involving the taking of predators which may portray hunting in an unethical fashion, devalue the predator, and which may be offensive to the general public. The Department opposes use of bounties as a predator control measure. The Department will not implement a program based, in whole or in part, on utilizing methods involving sterilization or birth control in wild animals.

The Department will cooperate with the Animal and Plant Health Inspection Service (APHIS) Wildlife Services Program to address specific areas and species, particularly on private lands, in a manner consistent with the approved interagency Memorandum of Understanding.

The Director may implement a Predation Management Plan in those circumstances where wildlife management objectives for prey species cannot be accomplished within two years by habitat manipulation, sportsman harvest, or interagency action designed to benefit the prey species, and where there is evidence that action affecting predators may aid in meeting management objectives. Essential components of such a Predation Management Plan are defined below.

This policy does not affect existing predator management policies and procedures used to administer livestock depredation issues.

IV. PROCEDURES

Managers recognize the role of predators in an ecological and conservation context. Impacts of the removal of individual predators on the structure of the predator population, as well as the prey population, will be considered. The actions by the Department must be based on the best available scientific information, and will be evaluated in terms of risk management to all affected wildlife species and habitats.

Valid concerns for human health and safety exist. Predator management will consider the need to avoid risk of human injury, loss of life, or potential for disease transmission.

Predator management may occur but is not limited to the following circumstances:

1. In localized areas where prey populations are fragmented or isolated, or where introductions or transplants of potentially vulnerable wildlife species (e.g., bighorn sheep, wild turkeys, sharp-tailed grouse, and others) has occurred or is imminent. Control may be intensive and of sufficient duration to allow transplanted animals and their progeny to become established and to become self-sustaining, or selective with removal efforts directed at specific offending animals.
2. In specific areas where managers are unable to meet management goals and objectives for prey populations due to predation. For example, in areas where survival or recruitment of game animal populations is chronically low and

management plan objectives have not been or cannot be met and where there is evidence that predation is a significant factor, predator control may be initiated.

3. On wildlife management areas, especially those which are managed primarily to provide for production of specific species (e.g., waterfowl), provision of critical winter range, and those acquired and managed to provide specific mitigation for wildlife losses elsewhere.

Predation Management Plans will consider options other than just predator removal. Various kinds of habitat manipulation can sometimes negate or minimize the effect of predators, including constructing nesting islands, providing cover plantings, or removal of roosts used by avian predators. Preventative actions are important in reducing conflicts with predators; therefore, the Department will seek ways to reduce the vulnerability of prey species to predation, and will cooperate with federal and state agencies, counties, and others to promote activities on public and private lands that will limit predator impacts. Such activities may include working with landowners and land managers to reduce winter concentrations of prey species (especially where artificially concentrated by food resources), and working with recreation managers to direct or reduce human activities that may increase the vulnerability of prey species to predators.

PREDATION MANAGEMENT PLANS

Predation management plans will be prepared using the following outline:

0. Definition of the problem. This definition must include a rationale for the proposed action. Such a rationale may include:
    A. a proposed management action (such a the introduction of a small number of animals into suitable but unoccupied habitat) that may be adversely affected by the presence and predictable actions of predators,
    B. a finding that approved wildlife management objectives are not being met due in large part to the actions of predators, or
    C. evidence that wildlife recruitment or populations has been or will be adversely impacted by the presence of predators.

1. Risk Assessment. A discussion of the ramifications of the program, including potential effects on:
    A. predator populations (i.e., will removal of avian roosting trees near a waterfowl production area affect non-targeted species, such as bald eagles? Will removal of specific individual animals result in vacant home ranges that will be especially attractive to transient predators of the same species?)
    B. prey or benefiting species,
    C. sportsmen and wildlife-associated recreational opportunity,
    D. landowners in or near the impacted area, and
    E. groups that will strongly favor or oppose the proposed action.

2. Program. A discussion of the specific proposed treatment, including:
    A. clearly-defined boundaries,
    B. the species of predator(s) affected,
    C. the prey or other species to benefit from any proposed action,
    D. the method or techniques identified to address identified concerns, including habitat manipulation where appropriate and the method(s) of predator removal (if removal is a component of the program),
    E. the objective and measure of success used to determine whether that objective has been achieved,
    F. date of initiation of actions,
    G. measurable objectives and monitoring plans to access program effectiveness, and

H. budget.

I. All predator management plans will be reviewed by the chief of the Bureau of Wildlife and regional supervisor. Predator management plans must be approved by the director. Predator management plans will be reviewed and evaluated annually.

REVISION DATE: This policy shall be reviewed on or before June 30, 2005.

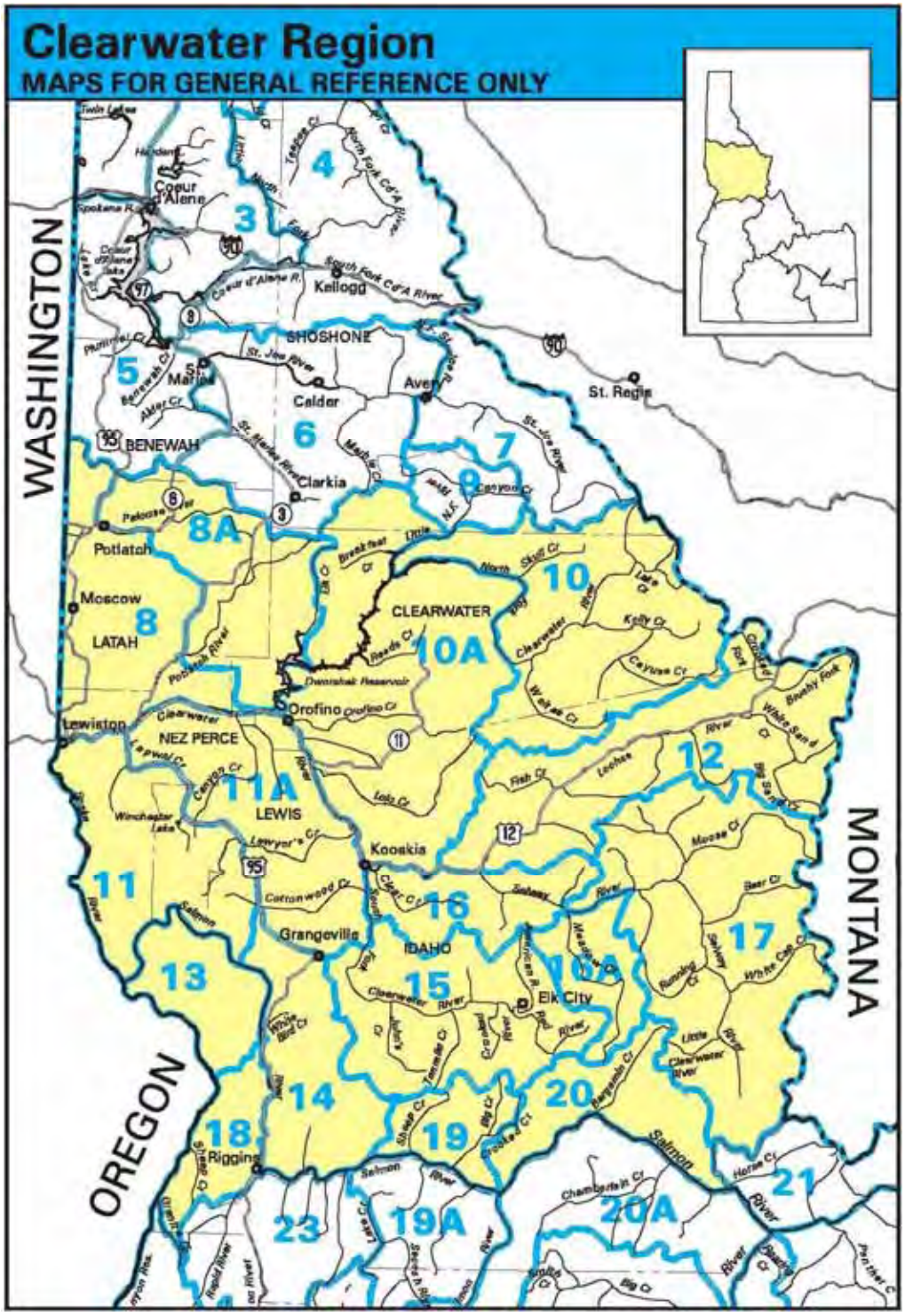

FIGURE 1. Location of GMU's 10, 12, 16A, 17, 19, and 20 in Idaho.