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BLUE MOUNTAINS ELK HERD PLAN

I. Introduction

The herd plan is a step-down planning document under the umbrella of the Washington State Management Plan for Elk (McCall, 1997) and the Environmental Impact Statement for Elk Management (McCall, 1996). For management and administrative purposes the State has been divided into numerous Game Management Units (GMUs). A group of GMUs is described as a Population Management Unit (PMU). The Blue Mountain Herd is one of ten herds designated in Washington. In this context a herd is defined as a population within a recognized boundary as described by a combination of GMUs. The Blue Mountains Elk Herd is in PMU 13 and has the following GMUs: 145 (Mayview), 149 (Prescott), 154 (Blue Creek), 157 (Watershed), 162 (Dayton), 163 (Marengo), 166 (Tucannon), 169 (Wenaha), 172 Mountain View), 175 (Lick Creek), 178 (Peola), 181 (Couse) and 186 (Grande Ronde). The distribution of the Blue Mountains elk herd in Washington is primarily within GMUs 154, 157, 162, 166, 169, 172-178, 181 and 186. Occasionally, elk are observed in GMUs 145, 149 and 163.

The Blue Mountains Elk Herd Plan is a five-year planning document subject to annual review and amendment. The Washington Department of Fish and Wildlife (WDFW) recognizes the sovereign status of federally recognized treaty tribes as co-managers. This document represents a cooperative and collaborative effort with the Nez Perce Tribe and the Confederated Tribes of the Umatilla Indian Reservation. It also recognizes the role of public land management agencies, notably the U.S. Forest Service, Washington Department of Natural Resources and Private lands in elk management.

II. Area Description

- A. Location:** The Blue Mountains are located in the southeast corner of Washington state. The Blue Mountains elk herd is distributed over an area of approximately 900 mi². The elk range in the Blue Mountains is divided into ten Game Management Units (GMUs): 154 (Blue Creek), 157 (Mill Creek Watershed), 162 (Dayton), 166 (Tucannon), 169 (Wenaha), 172 (Mountain View), 175 (Lick Creek), 178 (Peola), 181 (Couse), and 186 (Grande Ronde).
- B. Ownership:** Ownership between public and private lands varies by GMU, but approximately 63% (565 mi²) of the elk range is public land, whereas 37% (335 mi²) of the area is private land. Game management units 154, 162, 178, and 181 are largely privately owned, and are primarily agricultural and range lands. The majority of the area in GMUs 157, 166, 169, 175, and 186 is public land, managed by the U.S.D.A. Forest

Service (USFS), Washington Department of Natural Resources (DNR), Washington Department of Fish and Wildlife (WDFW), and Bureau of Land Management (BLM). The Confederated Tribes of the Umatilla Indian Reservation own the 8,100 acre Rainwater Wildlife Area in GMU 162. The Umatilla Tribes and WDFW have entered into a Memorandum of Understanding for the purpose of memorializing a mutual understanding that addresses specific wildlife, fish, habitat and land management projects that are currently in effect and to identify the areas that can be addressed in the future. GMU 172 is evenly split between public and private land. The Grouse Flats Wildlife Management Area is located in this unit. The WDFW's Asotin Wildlife Area is in GMU 175, Chief Joseph Wildlife Area is in GMU 186, and Wooten Wildlife Area is in GMU 166.

- C. Topography:** The Blue Mountains are part of the Columbia Plateau formed by fissure lava flows from the Miocene and early Pliocene periods. Uplifts occurring during the late Pliocene caused the Blue Mountains to rise above the Columbia Plateau. Erosion over millions of years created the major drainages of the Blue Mountains: Asotin Creek, Grande Ronde, Mill Creek, Touchet River, Tucannon River, Wenaha River, and Wenatchee Creek. The Blue Mountains are part of the Blue Mountains physiographic province (Franklin and Dyrness 1973). The elk herd ranges in elevation from 1,400 to 6,100 ft.

The climate in the Blue Mountains is primarily influenced by marine air from the Pacific Ocean. Summers are normally dry and hot, whereas winters are relatively mild. Temperatures average 57 F between April and November, while winter temperatures average 36 F from December through March; annual average temperature is 50 F. Precipitation averages 16 inches per year, with 44% (7 in) falling during December-March.

- D. Vegetation:** The vegetative communities of the Blue Mountains is a mixture of forests and bunch-grasses on the ridges. The lowlands are comprised of mostly agricultural crops and range land. This combination of habitats is very attractive to elk. The Blue Mountains in Washington consist of the following forest types as described by Kuchler (1964) for the United States: Western Spruce (*Picea* spp.)-Fir (*Abies* spp.) Forest, Western Ponderosa (*Pinus ponderosa*) Forest, and Grand Fir (*A. grandis*)-Douglas-fir (*Pseudotsuga menziesii*) Forest.

Two major soil types, vitrandepts and argixerolls, cover the area. Vitrandepts are of volcanic origin and are found at moderate to high elevations; these soils are formed under forested vegetation. Argixerolls are developed from loess and igneous rock and are found at lower elevations. Argixerolls support grassland, mainly bunch grasses (*Agropyron* spp.), and shrub/grass vegetation. Vegetative associations have been previously described by Daubenmire and Daubenmire (1968), Daubenmire (1970), and Franklyn and Dyrness (1973).

Higher elevations are characterized by heavy conifer forests on the north slopes and in the canyons, whereas south slopes are fairly open with scattered conifers and patches of brush. As elevation decreases, the steppe habitat type becomes more prominent and south slopes are more open, with bunch grass and low shrubs comprising the dominant vegetation. Riparian zones are dominated by deciduous trees and shrubs.

III. Distribution

- A. Historic Distribution:** Much discussion has occurred about the origin of the Blue Mountains elk herd. Elk have been present in the Columbia Basin and adjacent areas for at least 10,000 years, and were an important source of food for Native Americans (McCorquodale 1985). Unregulated subsistence and market hunting by Euro-American immigrants, along with habitat changes resulting from livestock grazing and land cultivation, nearly extirpated elk from the Blue Mountains by the late 1880's (McCorquodale 1985, ODFW 1992).

To help recover elk populations in the Blue Mountains, sportsmen's groups in southeast Washington initiated transplants of elk from Yellowstone National Park. Twenty-eight elk were released from Pomeroy in 1911; 50 elk from Walla Walla in 1919; and 26 elk from Dayton 1931 (Urness 1960). The first season for branched-antlered bull elk was held in 1927, and the first either-sex season in 1934 to reduce elk numbers and control damage on private lands in the Charley and Cummings Creek drainages.

- B. Current Distribution:** The density of the elk population in the Blue Mountains varies among the ten Game Management Units (GMU's). Major wintering populations occur in GMUs 154, 157, 162, 166, 169, 172, and 175. Smaller populations occur in GMUs 178, 181, and 186.
- C. Proposed Distribution:** There is no expansion proposed for the overall distribution of the Blue Mountains elk herd. Elk distribution in southeast Washington is limited biologically by the carrying capacity of seasonal ranges, and socially by human-elk conflicts on agricultural lands. Purchase of key private properties and managing them for elk will most likely be necessary to alleviate agricultural damage concerns and maintain current population levels into the future.

IV. Herd Management

- A. Herd History, Current Status, and Management Activities:**

Herd History: The elk population in the Blue Mountains peaked in the late 1970's and

early 1980's at approximately 6,500 elk. The elk population started declining in the late 1980's and 1990's. The 1999 population was estimated at 4,500 (\pm 500) animals, based upon estimated sightability from March surveys. Herd productivity declined in the mid-1980's. Post-hunting season calf-cow ratios historically ranged from 38-45 calves: 100 cows, while in recent years calf survival has declined with ratios ranging between 16-25 calves:100 cows.

Low pregnancy rates (65-68%) were recorded in the late-1980's and may have been the result of low bull ratios (2-5 bulls:100 cows) and poor physical condition in cow elk as a result of drought (Fowler, 1988). In 1989, a new harvest management strategy was implemented allowing hunters to harvest only spike bull elk with branch-antlered bulls by permit-only. The goal of this strategy was to increase post-season bull ratios to a minimum of 15 bulls:100 cows and to improve breeding effectiveness by increasing the number of adult bulls in the population. Within 2 years, post-season bull ratios increased to 16 bulls:100 cows, and pregnancy rates measured in 1992-1993 increased to an average of 90% (Fowler, 1993.).

Breeding effectiveness improved dramatically as adult bull numbers increased in the elk population. Prior to the increase in adult bulls produced by the "spike-only" management program, average mean conception dates were September 30 in 1987 and October 9 in 1988. By 1992 and 1993, the average conception date for cow elk in the Blue Mountains was earlier (September 24, and September 18, respectively) (Fig. 1.). The date of conception is important because calves that are born early have a greater chance of surviving (Thorne et al. 1976).

Although pregnancy rates, conception dates, and early summer calf ratios have improved to 50+ calves\100 cows, calf survival over time remains below management objective. Survival of adult cows is also crucial for maintenance of the Blue Mountains elk herd. Cow elk survival has also improved in the West Blue Mountains due to the elimination of general season cow permits. Results of the current research project will recommend future agency management activities to maximize attainable calf and adult female survival and increase the Blue Mountains elk herd in appropriate sub-herds.

Estimated Population Size: Between 1993-1999, the Blue Mountains elk population estimate averaged 4,500 elk (range: 4,300-4,700). This estimate is based on the number of elk observed ($O = 3652$) (Table 1), adjusted for sightability. Based upon estimated habitat carrying capacity and historic population levels, the elk population management objective for the Blue Mountains is 5,600.

Table 1. Elk Survey History, 1994-2000 and Elk Population Objectives.

Game Management Unit	Mean # Elk Counted, 1993-99	Population Objective
154-157 Blue Creek-Watershed	813 *	800
162-Dayton	757	800
166-Tucannon	423	700
169-Wenaha	476	1,400
172-Mountain View	404	700
175-Lick Creek	623	1,000
178-Peola	N/A	0-50
181-Couse	35	≤ 50
186-Grande Ronde	62	≤ 150
Total	3,593	5,600

* Survey data combined because elk from GMU-157 enter GMU-154 to winter.

Population status, by GMU: In GMU 154-Blue Creek, elk migrate into Washington from Oregon during periods of severe weather, which causes the wintering elk population in Washington to fluctuate dramatically. Elk from GMU 157-Watershed also winter in GMU 154.

The elk population in GMU 162-Dayton has increased slightly in recent years, even though calf survival is low. The increase is due to the elimination of antlerless elk permits from 1994-1999. Elk counted during March surveys has increased from a low of 375 in 1989, to 818 in 2000. The antlerless harvest has been reduced significantly since 1994, but may need to be re-implemented to hold this population within management objectives.

The number of elk counted during surveys in GMU 166-Tucannon has declined from 791 in 1988 to 420 in 2000. Within this unit, the number of elk counted east of the Tucannon River has declined significantly, while elk numbers west of the Tucannon have increased. Adult bull survival east of the Tucannon River has also declined significantly over the last six years.

The elk population north of the Wenaha River in GMU 169-Wenaha has declined during the last 15 years. Surveys conducted in the mid-1980's documented 2,500 elk wintering north of the Wenaha; only 650 elk were estimated (447 elk counted-ODFW) based on spring surveys in 2000. Several factors are thought to have contributed to the observed decline in elk numbers, including: documented low calf survival for many years; and, harvest of cow elk during antlerless hunts in adjacent units of Oregon and Washington (GMU 172); changes in the vegetative communities resulting from fire suppression within the Wenaha Wilderness may have reduced the carrying capacity for elk, causing elk to move further south into Oregon to find adequate winter range. This exposed them to late-season antlerless hunts in Oregon. Between 1995 and 1999 Oregon responded by reducing and/or eliminating antlerless permits in units that are below management objectives.

The number of elk counted during surveys in GMU 172-Mountain View has declined from 626 in 1990 to a low of 345 in 1996. This is a direct result of low calf survival and cow elk lost to antlerless permits issued for damage control prior to 1995. Since 1995, management action was taken to reduce the loss of cow elk to damage control. Post-season surveys (March-2000) resulted in a count of 533 elk, which shows improvement.

The number of elk counted during surveys in GMU 175-Lick Creek has declined from a high of 1098 in 1989 to 529 in 1997. The number of elk counted since 1998 has ranged from 620-649. Low calf survival and the loss of antlerless elk from the population have been identified as factors which negatively impact this elk herd. Adult bull survival in GMU-175 is the lowest of any GMU in the Blue Mountains at 2 ad.bull/100 cows, compared to an average of 11 ad.bulls/100 cows for all other units. On March 7 and 8, 2000, seventy-two elk from the Hanford Site (DOE) were released in GMU-175 in an effort to improve productivity and increase the population to management objective.

While GMU 178-Peola is not managed to encourage elk, poor maintenance of the elk fence and a continuous loss of elk to damage control prior to 1997 contributed significantly to declining elk numbers in adjacent elk units (GMUs 166 & 175). The installation of one-way gates in the elk fence has greatly reduced the loss of elk to damage control in this unit.

Neither GMU 181-Couse nor GMU 186-Grande Ronde contain major elk populations. Elk numbers in GMU 181 have ranged from 10-150 during surveys. The resident elk population in GMU 186 varies between 50 and 150 elk. Elk from Oregon move into GMU 186 during the winter months increasing the elk population by 250 to 550 elk, depending on the severity of winter conditions.

Herd Composition: Pre- and post-hunting season surveys are conducted annually to determine herd composition and population trend by GMU (Tables 2 and 3). Pre hunting season surveys are usually conducted from the ground to collect herd composition data, but this effort has declined during the last two years due to lack of time and manpower. Post hunting season surveys are conducted in March using a Hiller 12-E helicopter to collect herd composition and population trend data. Aerial surveys are designed to follow protocol for the Idaho Sightability Model. The Idaho protocol is very similar to the procedures that have been in place since 1988. From 1993 to 1999, post-hunting season bull:cow ratios averaged 13 bulls:100 cows, GMU-154 13 bulls:100 cows, GMU-157 18 bulls:100 cows, GMU-162 14 bulls:100 cows, GMU-166 11 bulls:100 cows, GMU-169 24 bulls:100 cows, GMU-172 20 bulls:100 cows, GMU-175 6 bulls:100 cows (Table 3). From 1993-1998, post-hunting season calf:cow ratios averaged 21 calves:100 cows.

Post-season bull ratios in GMU 172 (Mountain View) are influenced by bull elk migrating into this unit from GMU 169 (Wenaha) during the late winter. Years that produce high bull ratios in GMU 172 usually produce lower bull ratios in GMU 169. This factor is addressed when calculating the number of controlled hunt permits for bull elk in GMU 172.

Table 2. Pre-hunting season population composition data for the Blue Mountains elk herd, 1988-1999.

Year	Bulls: 100 cows	Adult bulls: 100 cows	Calves: 100 cows	Sample size
1988	18		40	711
1989	11		41	998
1990	15	6	50	768
1991	20	7	45	1,667
1992	21	12	47	1,304
1993	18	10	51	1,475
1994	18	5	50	905
1995	11	4	40	1,036
1996	13	6	48	1,656
1997	11	9	53	1,189
1998	14	5	55	976
1999	15	7	58	388

Mortality factors:

Recreational harvest - Recreational harvest of elk in the Blue Mountains has declined dramatically since 1981 because of harvest restrictions necessitated by declining elk populations and low bull survival. Harvest has shown a significant decreasing trend ($r = -0.96$; $P < 0.001$) from 1981 to 1996 (Appendix 1). Harvest declined 85% (2,161 to 315) during this period. For this period harvest of antlered elk declined 86% (1,451 to 208) and antlerless harvest declined 85% (710 to 107). WDFW currently restricts antlerless harvest to private lands damage control situations.

Tribal harvest -The Nez Perce have traditionally exercised their treaty hunting rights within GMU's 166 and 175. The tribe does not require harvest reporting or regulate hunting by members, so the number and composition of elk harvested are not known.

The Umatilla tribe has not exercised treaty hunting rights to a significant degree within Washington in recent years. This may change due to the tribes acquisition of the Rainwater Wildlife Area on Robinette Mountain (8,100 acres).

Damage removal - Agricultural damage complaints involving elk are a historical problem in the Blue Mountains. The WDFW is required by law to respond to damage complaints. When elk damage cannot be reduced by herding (aerial or ground) hotspot hunts, landowner preference permits, or kill permits are used in an attempt to modify elk behavior and move them away from the damage area. Since 1991, 144 elk have been harvested under hotspot hunts (16/yr.), 14 harvested under landowner preference permits (1.6/yr.), and 7 with kill permits (0.8/yr.).

Calf/cow elk survival - As mentioned above, calf survival continues to be below that observed in the early 1980's. Calf mortality studies (Myers et. al. 1997) have shown that a minimum of 58% of the annual calf crop is lost during the first year of life, and approximately 78% of the calf mortality is due to predation. Predation rates may be influenced by predator densities, prey susceptibility, and other factors. In addition, an adequate survival rate of the adult cow component of the population is crucial for maintenance of the Blue Mountains elk herd. The current research project will include recommendations for future agency management activities to maximize attainable calf and adult female survival to stabilize or increase appropriate elk sub-herds within the Blue Mountains.

Table 3. Elk composition-population trend surveys for the Blue Mountains, 1987-2000.

March surveys Year	Bulls: 100 cows	Adult bulls: 100 cows	Calves: 100 cows	Sample size
1987	7	2	35	2,060
1988	6	1	32	2,962
1989	5	1	22	4,196
1990	8	3	25	3,706
1991	11	7	28	4,072
1992	16	10	18	3,560
1993	13	8	19	4,092
1994	14	10	18	3,161
1995	17	13	20	3,689
1996	14	11	15	3,656
1997	13	9	24	3,405
1998	11	8	23	3,118
1999	13	9	23	3,615
2000	12	9	17	3,628

Poaching - Known instances of poaching of adult bull elk are increasing. Increased public awareness to help with information on poaching will help reduce this problem. In addition, it is hoped that newly increased penalties for poaching trophy-class animals will be a significant deterrent for poachers. The new civil penalty for poaching a trophy-class bull elk (six points or more on either side) is \$6,000.

Natural predators - Although the WDFW does not conduct population surveys of cougar and bear, we do monitor damage complaints and harvest rates. Over the last 10 years both bear and cougar populations appear to have increased significantly. Damage complaints and harvest rates have increased, as has incidental observations of these species during other surveys and field activities.

Hounds were allowed for cougar and bear hunting up until 1996. From 1974-86 the number of cougar harvested by hunting and removed in damage complaints averaged 2 cougar/year in the Blue Mountains. The number of cougar removed through harvest and

damage averaged 17 cougar\year between 1987 and 1997. The use of hounds for hunting cougar and bear was eliminated due to Initiative in 1996. The number of cougar removed through harvest and damage complaints averaged 22 cougar\year for 1998 and 1999. The 1999-2000 hunting season resulted in 36 cougar taken in the Blue Mountains. The trend in the cougar harvest and damage complaints substantiates a significant increase in the cougar population.

B. Social and Economic Values

Number of Hunters and Hunter Days: The number of hunters and number of hunter days declined in the Blue Mountains from 1981 to 1988 (Appendix 1). These declines can be attributed to the implementation of early and late elk seasons in 1983, the requirement to choose one hunting method (archery, modern firearm, or muzzleloader) in 1984, and declining hunter success. Following implementation of the spike-only strategy with branch-antlered bull by permit-only in 1989 and continued low hunter success, both the number of hunters ($r=-0.86$; $P=0.007$) and hunter days ($r=-0.90$; $P=0.003$) have shown significant decreasing trends from 1988 to 1996 (Appendix 1). From 1988 to 1998, the number of elk tags sold in the Blue Mountains zone declined 65% (11,179 to 3,886) and hunter days declined 58% (51,586 to 21,769).

The value of elk to the state and local economy was estimated to be as high as \$1,945 per harvested elk in the Blue Mountains (Myers 1999). The 1996 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reported that trip and equipment expenditures for big game hunting in 1996 averaged \$860 per hunter (U.S. Dept. of Interior, et al. 1996). There were 5,501 elk hunters reported hunting the Blue Mountains of Washington in 1998. Using the \$860 average expenditure per hunter from the National Survey, Blue Mountain elk hunters added \$4,730,860 to the local and state economy in 1998. The decline of elk hunting opportunity in the Blue Mountains since the mid-1980's has resulted in a significant economic loss. Elk hunter numbers reached a high 18,000 in the early 1980's. Current elk hunter numbers represents a 69% decline. Although hunter numbers were too high in the 1980's and caused problems with bull survival, elk hunting provided a significant economic boost to local communities. At today's costs (\$860/hunter) this decline in hunter numbers would represent a loss of \$10,750,000 in revenue to the local and state economy.

Harvest Strategies: Specific recommendations for harvest strategies will be made every three years as a part of the current WDFW Commission policy of adopting hunting seasons for a three year period with annual establishment of permit seasons and necessary amendments. The three-year hunting package will serve as the Harvest Plan. Prior to 1989 hunters were allowed to harvest any bull during the general season. Hunter numbers increased to such high levels during the 1970's and 1980's that bull survival declined dramatically to post hunting season ratios of 2-5 bulls/ 100 cows. Bull ratios at that level resulted in breeding efficiency problems within the elk herd, and the WDFW was forced to

change harvest management in order to increase bull survival. In 1989, the spike-only strategy with branch-antlered bulls by permit-only was adopted for the Blue Mountains. This system has produced a high-quality adult bull population and a marked increase in breeding effectiveness. The permit controlled system of harvesting adult bulls continues to produce hunter success rates for this component of the harvest, averaging 43%, with 65% of the bulls harvested being six-point or larger.

The harvest of spike bulls by general tag holders has decreased significantly between 1985-1998 (623 - 104). This reduction in harvest is a result of population declines in several sub-herds, and reduced calf survival.

Game Management Unit 157 (Mill Creek Watershed) is restricted to human entry by cooperative agreement with the city of Walla Walla because it provides the water supply for the city. The only public entry into this unit are permit-only hunters in Washington and Oregon. Each state issues a limited number of permits each year for its portion of GMU 157. This unit is managed under a permit-only strategy for three-point minimum bull or antlerless elk. This strategy meets objectives of the unit and increases the survival of yearling bulls for GMU 157 and adjacent units. The management objective for GMU 157 will be to maintain control of the elk population through permit-only hunting.

Damage: The Blue Mountains Elk Control Committee (BMECC) was established in 1989 to develop better ways of dealing with elk/landowner conflicts. The BMECC developed the Blue Mountains Elk Control Plan outlining policies and procedures for dealing with elk damage problems. The BMECC has also been instrumental in securing funding for several major habitat improvement projects and research on elk. Elk/landowner conflicts continue to be a major issue in the Blue Mountains. Formation of the BMECC has produced a better working relationship between landowners and the WDFW when dealing with elk damage. This organization may be the vehicle for the development of a step-down activity plan for managing elk damage on the Blue Mountains.

Elk damage to crops and fences is a continuing problem on the lowlands of the Blue Mountains elk herd area. The Enforcement Program has maintained recent records of damage complaints and claims for damage, (Appendix 2 & 3). Elk damage complaints reported to WDFW in 1995, 1998 and 1999 ranged between 36 and 47. Elk damage appears to occur more frequently during the period April through September. During winters with heavy snowfall, damage to hay stacks may also be a problem. Agricultural damage and landowner intolerance continue to be a significant elk management problem in GMU 154 (Blue Creek). However, implementation of the Blue Mountains Elk Control Plan has improved landowner/WDFW relations.

In GMU 162 (Dayton), agricultural damage is historical on northern Robinette Mountain and in the upper Hatley Gulch-Patit areas of Eckler Mountain. The use of hot-spot hunts and landowner preference permits have improved landowner/WDFW relations, but

complaints of elk damage continue.

The late archery season in GMU 166 (Tucannon) was eliminated because this season forced elk off of the Wooten Wildlife Area and onto private lands in the Eckler Mountain-Patit areas. To reverse this trend, the late archery season was adjusted in 1997.

Within GMU 172 (Mountain View), landowner/elk conflicts occur on both agricultural crop lands and private range land because elk compete with domestic livestock on native range. This has forced the WDFW to maintain elk numbers below their potential. In GMU 172, a program involving land purchases, forage enhancement programs, and landowner compensation is needed to increase landowner tolerance of elk.

A 27-mile long elk fence forms the entire southern border of GMU 178 (Peola). The fence extends from the Wooten Wildlife Area on the Tucannon Road, east to USFS land on the Mountain Road, then east to the edge of the Asotin Wildlife Area on Tam Tam Ridge in GMU 175. This fence was designed to prevent large numbers of elk from moving north onto agricultural lands in GMU 178. However, elk damage complaints from a few landowners have been a continuous problem for many years. Failure to adequately maintain the elk fence and the inadequate length of the fence has resulted in large numbers of elk accessing private land and causing damage. Approximately 1,206 cow elk have been harvested in this unit using either-sex seasons between 1975-1994. From 1994 to 1997, permits have been issued to control the harvest of elk in this unit. Excessive kills in this unit provides a major drain on elk numbers in GMUs 166 and 175 and is one of the reasons these populations are below population management objectives.

The solution to damage problems in GMU 178 lies in the implementation of several programs. In fall 1997, 12 one-way gates were placed at strategic points along the fence to allow elk that are outside the fence to cross back through, thus eliminating the loss of large numbers of elk trapped outside the fence. These one-way gates appear to be working, allowing elk trapped outside the elk fence in GMU-178 to move back through the fence into GMU's 166 and 175. In addition, the elk fence must receive higher priority in the capital budget and a maintenance schedule must be implemented that maintains and repairs the fence throughout the year. The elk fence should be extended for approximately two miles along its eastern boundary to stop elk from going around the fence during the winter. Lastly, the Program with damage control responsibility (currently, Enforcement) should prioritize at least \$3,000/year for helicopter time to herd elk back inside the fence when necessary.

The potential for large groups of adult bulls from GMUs 166 and 175 to get trapped outside the elk fence in GMU 178 is high because of the poor condition of the fence. The adult bull harvest in GMU 178 should be controlled by a conservative level of permits to minimize the drain on the adult bull population in GMU 166 east of the Tucannon River and in GMU 175 because both units are below management objectives for bull elk.

Landowners in GMU 178 do not complain about adult bulls, and may in fact close their land to other hunters if the landowner is lucky enough to draw a bull permit. Therefore, the need to excessively harvest adult bulls because of "damage" is not valid in this unit.

The elk in the Schumaker Grade-Ten Mile area in GMU 181 (Couse) tend to cause landowner damage complaints if numbers exceed 25-50 elk. The number of elk wintering in this unit has increased dramatically over the last 5 years, from as low as 12 elk in 1992 to more than 150 elk in 1996. This shift in elk distribution is due to two factors. First, a late cow hunt in GMU 172 was held in 1989 to address landowner complaints but was terminated in 1995 due to declining elk numbers. Hunter pressure from this season from 1989 to 1995 forced elk to move westward into GMU 181 to avoid hunting pressure, causing a redistribution of elk over time. Second, range conditions in GMU 172 are poor due to overgrazing by domestic livestock, which contributes to elk moving to the west, across the Rattlesnake Grade, during periods of severe weather. Early- and late-muzzleloader seasons were implemented in 1997 to encourage these elk to stay east of the Rattlesnake Grade. Only 26 cow elk have been harvested during this muzzleloader season, and the number of elk counted in GMU-181 Couse during post-season surveys has dropped from 150 in 1996, to 26 in 1997, to zero in 1998. The number of elk counted in GMU-172 Mountain View during this same period has increased by 119.

Tribal Hunting: Two tribes, the Nez Perce and Umatilla, retain treaty hunting rights within the Blue Mountains. Coordination of management objectives between the state and tribe, both for habitat and harvest, will prove to be in the best interest of future elk recovery.

Late Winter-Spring Recreation: The number of individuals participating in bird watching, day hiking, and shed antler hunting has increased phenomenally over the last five years. This type of activity starts as early as January and continues into June. Disturbance generated by this constant activity may be causing considerable harassment of elk on the winter ranges, and redistributing elk into agricultural areas. Human activity in critical areas on WDFW lands may need to be monitored and controlled if it keeps increasing.

Non-consumptive Uses: Non-consumptive viewing of elk in the Blue Mountains has increased significantly since implementation of the spike-only strategy. The increase in adult bulls has resulted in a significant increase in public viewing, especially during the breeding season and winter months.

V. Habitat Management

Elk populations in the Blue Mountains face significant problems with habitat. Many habitat improvement projects have been developed and completed by the WDFW and USFS to improve habitat effectiveness for elk and reduce elk damage on private lands (Appendix 4).

Forage enhancement projects, controlled burns, water developments, and area closures have been done. The WDFW will continue to develop habitat improvement projects through partnerships with the RMEF and the Blue Mountains Elk Initiative. The Elk Initiative is a group made up of WDFW, Oregon Department of Fish and Wildlife, USFS, and private landowners whose main objective is to initiate projects to improve elk habitat in Washington and Oregon.

WDFW and the USFS have initiated access closures on winter range to reduce harassment to wintering elk. Area closures have also been implemented around major elk calving areas. Violations of these closures continues to be an on-going problem.

WDFW has worked closely with the USFS to improve habitat effectiveness for elk by reducing road densities in important elk habitat. In GMU 162, road closures have been applied on the Walla Walla and Pomeroy Ranger Districts. In GMU 166, increased road building is a problem, and a road closure program has been implemented on the Pomeroy Ranger District; however, better enforcement and control of firewood cutting is needed to improve elk use in many areas. Increased vehicle traffic due to firewood cutting from summer-fall reduces elk use of areas near roads (Perry and Overly 1977).

In GMU 175 (Lick Creek), high road densities on USFS land combined with uncontrolled firewood cutting reduce summer range habitat effectiveness for elk. A winter range closure and calving area closures have been applied in this unit. However, based on field observations, violations of these closures appear to be increasing.

Fire suppression has reduced the quality of the elk habitat in many areas of the Blue Mountains. Fire suppression on USFS lands in GMUs 157, 162, 166, 169, 172, and 175 has diminished long-term habitat effectiveness. The USFS's new Fire Management Policy will improve habitat conditions for elk through the use of prescribed and controlled natural fires. This policy will affect the Wenaha-Tucannon Wilderness in the Pomeroy Ranger District, and will hopefully allow fire to play its natural role in maintaining habitat conditions in this area. The WDFW will work with the USFS to improve habitat conditions through the use of fire.

The spread of noxious weeds continues to be a major problem in many areas. The WDFW has implemented weed control programs on its lands, and continues to work with USFS to identify and control noxious weeds on USFS lands. In GMU 166, noxious weeds are a problem on elk winter range. A weed control program was initiated on the Wooten Wildlife Area in GMU 166; however, noxious weeds on adjacent private lands are not being adequately controlled and threaten to compromise weed control efforts on the Wildlife Area. Habitat conditions in GMUs 154, 157, and 162 continue to deteriorate due to noxious weeds, such as the yellow-star thistle, which are spreading from private land to public land.

In GMU 162 (Dayton) forage enhancement and water development projects involving the RMEF have been completed on Robinette and Eckler mountains. These projects have been successful in attracting elk onto these areas.

Silvicultural treatment, especially clear cutting adjacent to open roads, has impacted elk habitat in many areas in the Blue Mountains. Numerous clear cuts reduce the amount of security and thermal cover available for elk, and associated road development increases vulnerability. In GMUs 166 and 175 increased logging, open roads, and uncontrolled firewood cutting have contributed to declining elk use in areas of important summer habitat.

In GMU 172 (Mountain View), range conditions on USFS lands appear to be good, but many private land parcels appear to be severely over-grazed, a condition which dramatically increases the risk of a noxious weed problem. Habitat conditions on public land in GMU 186 are excellent. Trespass cattle on the Chief Joseph Wildlife Area continues to be an annual problem.

Sale and sub-division of large tracts of land also contributes to the loss of elk habitat in some areas. Habitat conditions in GMU-154 continue to deteriorate due to subdividing of land into smaller parcels.

The use of off-road vehicles on developed trail systems on USFS land in GMUs 162 and 166 could result in increased harassment of elk and decreased use by elk of prime habitat areas. This problem is especially acute when trails are constructed through known elk calving areas and high-use summer habitat. WDFW will continue to work closely with the Forest Service on Travel and Access Management Plans in order to minimize this impact.

VI. Research Needs

Two current research projects should confirm some of the problems faced by the Blue Mountains elk population and provide management recommendations for the future.

1. In 1990, a research project was initiated to assess elk populations and distribution, habitat use, damage problems, and control measures. This research project is titled "Elk Populations and Habitat Assessment in the Blue Mountains of Washington."
2. A second research project was initiated in 1992 to determine the factors responsible for low survival of elk calves. This project is titled, "Investigations of Elk Calf Mortalities in the Blue Mountains, Washington." .
3. New research efforts for the Blue Mountains elk herd should center around elk damage problems and elk/landowner conflicts. Research is needed to determine when and what crops are susceptible to damage, and methods should be developed to accurately determine damage levels. The effectiveness of current control techniques should be determined, and better control techniques should be developed.

VII. Herd Management Objectives

The Blue Mountains Elk Herd Plan provides the historical background, current condition and trend of this important resource. It is essentially an assessment document that, identifies management problems, develops solutions to overcome these problems, and sets direction. The plan outlines strategies and helps establishes priorities in resolving management of the elk herd. It provides a readily accessible resource for biological information collected from the herd and identifies inadequacies in scientific information. The objectives of the Blue Mountains Elk Herd plan are to:

- 1.) To manage the Blue Mountains elk herd for sustained yield.
- 2.) To manage elk for a variety of recreational, educational and aesthetic purposes including hunting, scientific study, cultural and ceremonial uses by Native Americans, wildlife viewing and photography
- 3.) Protect, manage and enhance elk habitats to ensure healthy, productive populations.

VIII. Herd Management Recommendations

A. Herd Management Goals, Problems, and Strategies

- 1. Population goal levels by GMU are as follows.

Increase Population Levels

<u>GMU</u>	<u>GOAL</u>
GMU-166 Tucannon	700
GMU-169 Wenaha	1,400
GMU-172 Mountain View	700
GMU-175 Lick Creek	1,000

Maintain Population Levels

<u>GMU</u>	<u>GOAL</u>
GMU-154-157 Blue Creek-Watershed	800
GMU-162 Dayton	800

Suppress Population Levels

<u>GMU</u>	<u>GOAL</u>
GMU-178 Peola	< 30
GMU-181 Couse	< 50
GMU-186 Grande Ronde	< 150

Problem: The current 1999 Blue Mountains elk population estimate is 4,500, or 20% below the population goal of 5,600 elk.

Strategy:

- a. In units consisting of primarily public land, increase elk numbers in units that are below management objective. In units with historical agricultural damage problems maintain elk numbers at levels that are compatible with overall management objectives. In “no elk zone” areas strive to keep elk numbers below target objectives to minimize damage complaints.
 - b. Work cooperatively with the USFS to implement habitat improvement projects on National Forest to increase elk carrying capacity through forage enhancement projects, road-closures, etc.
 - c. Implement harvest management actions that would allow the population to grow in GMU’s 166, 169, 172, and 175.
 - d. Implement harvest management actions in GMU’s 154, 157, 162 to maintain static elk population levels.
 - e. Implement low impact harvest management actions (antlerless permits, ML seasons, hotspot hunts, landowner permits) to suppress or redistribute elk populations in GMU’s 181 and 186.
 - f. Utilize one-way gates, and harvest strategies that minimize elk movement onto agricultural lands in GMU-178 Peola.
 - g. If feasible, augment the elk population in GMU-175 when it is ≥ 200 elk below management objective.
 - h. Increase hunter harvest of cougar and black bear, within guidelines established for these species, where elk populations are below management objectives and show poor recruitment or excessive losses to these predators.
2. *Goal:* Improve the scientific database for managing the elk population.

Problem: Harvest information (kill and hunter effort) collected from report cards and the hunter questionnaire is not providing accurate information for use at the GMU level. Tribal harvest is not available. Herd surveys and harvest data are critical elements in monitoring herd status and making management recommendations.

Strategy:

- a. Increase pre-season survey sampling to 1500 elk. Ground counts would require approximately 50 person-days, while helicopter surveys would require approximately 10 hours (\$3,500).
- b. Maintain accuracy of post-season aerial counts by surveying 70% of the GMU’S; This will require approximately 30 hours of helicopter time at a cost of about \$10,500 annually.
- c. Coordinate and cooperate with the Tribes to exchange accurate harvest information.
- d. Increase the statistical precision of population estimates through development of an elk sightability model, and use of appropriate population models.

3. *Goal:* Provide recreational hunting opportunity in keeping with overall elk herd management objectives and specific bull elk survival targets as follows:

In GMU's 154, 157, 162, 166, 172, 175, and 186 maintain post hunting season bull ratios of ≥ 15 bulls\ 100 cows in combination with overall bull mortality of $\leq 50\%$.

In GMU 169, maintain a post hunting season bull ratio of ≥ 20 bulls\ 100 cows in combination with a bull elk mortality rate of $\leq 40\%$.

Maintain the permit controlled bull elk harvest of $\geq 60\%$ six point or larger bulls for all GMU's.

Problem: Bull escapement goals cannot be achieved by maximizing recreational hunting opportunity through general seasons without specific strategies to protect bulls. Increasing hunting opportunity will decrease spike bull survival rates, which will compromise adult bull survival targets.

Strategies:

- a. Maintain Spike-only general hunting seasons with branched antlered bulls by permit only.
- b. Alternatively, it may be necessary to initiate a permit controlled spike-only hunting season strategy if yearling bull recruitment into the adult bull population declines.
- c. Provide antlerless elk permit-only hunting opportunities to meet herd management objectives.

4. *Goal:* Coordinate management of sub-herds within GMU's 157, 169, 172, and 186 with the State of Oregon.

Problem: Portions of elk sub-herds within GMU's 157, 169, 172, and 186 summer in Washington and winter in Oregon, or vice versa, and are subject to dual hunting seasons.

Strategy:

- a. Work cooperatively with Oregon biologists to establish population and harvest objectives for inter-state elk herds in GMU's 157, 169, 172, and 186.

5. *Goal:* Increase public awareness of the elk resource and promote viewing and photographic opportunities.

Problem: Promotion of "non-consumptive" use values requires careful planning and assurance that they will not adversely impact the resource.

Strategies:

- a. Develop a brochure for the public with general information on where elk are likely to be found and their natural history and management.
- b. Maintain a close intra-departmental coordination effort in this regard to insure that use ethics are taught, and facilities developed to meet this demand will not

- adversely impact the elk resource.
- c. Determine if shed antler hunting activity has an adverse impact on elk.

6. *Goal:* Reduce damage caused by elk on private lands.

Problem: Elk cause damage to high value agricultural crops, compete for forage with domestic livestock, and cause property damage (fences).

Strategy:

- a. Maintain Blue Mountains Elk Control Plan to improve relations with landowners and increase tolerance for elk among landowners.
- b. Repair, maintain, and extend the elk fence that forms the southern boundary of GMU-178 Peola. The elk fence should be extended for approximately 2 miles east. Helicopter time should be included in the annual budget to herd elk off private land, where feasible.
- c. Continue to use low impact, permit controlled seasons to redistribute elk and reduce damage.
- d. Reduce damage to private lands through land acquisitions; GMU's 162, 166, 172, and 175.
- e. Keep resident elk populations in GMU's 178 and 181 at ≤ 30 and ≤ 50 elk, respectively.
- f. Work with Problem Wildlife Section of the Enforcement Program to determine timing of elk damage to crops, effectiveness of current control techniques, and develop better control strategies.

7. *Goals:* Coordinate recreational harvest of black bear and cougar with elk management objectives.

Problem: High predator populations and depressed elk populations have a deleterious impact on maintaining elk population goals on the eastside of the Blue Mountains and in the Wenaha-Tucannon Wilderness (GMU-169).

Strategies:

- a. Recommend increased harvest of black bear and cougar, within the guidelines established for these species, in the Blue Mountains as long as the combination of high predator populations are related to poor recruitment, and declining and/or depressed elk populations exist.
- b. Encourage cougar hunting in the Blue Mountains area to compensate for reduced activity as a result of the ban on the use of hounds for hunting bear and cougar by providing information on alternative hunting techniques.

8. *Goal:* Reduce poaching of elk.

Problem: Poaching is a growing concern in the Blue Mountains with the increased numbers of adult bull elk that carry high quality antlers.

Strategies:

- a. Increase public awareness of the problems of illegal harvest of adult bull elk and solicit their help in apprehending violators.
 - b. Inform the public on how to report violations; Poaching Hotline, State Patrol, County Sheriff's Office.
 - c. Encourage District Court Judges to apply mandatory penalties (\$6,000) for poaching trophy class bull elk as required under RCW 77.21.070.
9. *Goal:* Cooperate with the Nez Perce and Umatilla Tribes to implement the Blue Mountains Elk Herd Plan.

Problem: Portions of the Blue Mountains elk herd are within the Nez Perce and Umatilla Tribes ceded area and are subject to dual hunting seasons and regulations.

Strategies:

- a. Work cooperatively with the tribes in developing specific strategies for elk management in the Blue Mountains with emphasis in GMU's 162, 166, and 175.
- b. Develop a coordinated plan with the Nez Perce and Umatilla Tribes to accurately monitor, collect, and share the data on tribal harvest in the Blue Mountains as per Hunting Management Guidelines Between the Washington Department of Fish and Wildlife and the Tribes.
- c. Research the possibility of redirecting some tribal harvest on National Forest lands where elk populations are below management goals to private land damage areas.

B. Habitat Management Goals, Problems and Strategies.

1. *Goal:* Improve habitat conditions for elk on National Forest lands.

Problem: Elk habitat condition and functionality has been compromised by increased road densities, noxious weed invasion, firewood cutting, fire suppression policies, silvicultural practices, and off-road use.

Strategies:

- a. Work with the USFS on their new Fire Management Plan to improve habitat conditions for elk using prescribed fires and controlled natural fires.
- b. Work with the USFS and identify ways to improve habitat conditions in GMU's 157, 162, 166, 169, 172, and 175.
- c. Continue efforts to reduce open road densities to \leq one mile per square mile on National Forest land outside of roadless and wilderness areas, via road closures, road obliteration, and limited future road construction.
- d. Enforce closures of elk winter range and calving areas.
- e. Encourage the USFS to control noxious weeds, such as yellow-star thistle and knapweed on elk winter range in GMU's 157, 162, 166, 169, 172, and 175.
- f. WDFW will review and comment on draft environmental impact statements

(DEIS) and timber sale EA's to assess impacts to elk and their habitat.

- g. WDFW will work with the USFS to identify silvicultural treatments that benefit elk.
- h. Encourage the USFS to control the timing and distribution of woodcutting areas in order to minimize elk disturbance, especially in high use summer elk areas.
- i. Work with the USFS in their development of OHV trails so they will not be placed in sensitive elk habitat, and to minimize OHV impacts on elk.
- h. Develop partnerships with affected Tribes to address elk habitat issues on public and tribal lands.
- k. Implement the M.O.U. between the Confederated Tribes of the Umatilla Indian Reservation and the Washington Department of Fish and Wildlife - June 1999.

2. *Goal:* Encourage private landowners to enhance elk habitat.

Problem: Private lands are often important areas traditionally used by elk, but are being impacted severely by conflicting uses such as land subdivisions, change in agricultural practices, and invasion of noxious weeds.

Strategies:

- a. Educate private landowners on the problem of noxious weeds, such as the yellow-star thistle, that spread from private to public land in GMU's 154, 162, 166, 172, 175, and 186.
- b. Coordinate with cooperative extension offices to encourage landowners to manage domestic livestock grazing in order to minimize the spread of noxious weeds.
- c. Work with the counties on growth management to minimize the loss of elk winter range to development.
- d. Develop cooperative weed control projects with landowners adjacent to WDFW lands.
- e. Encourage landowners to control the spread of noxious weeds.

3. *Goal:* Improve habitat conditions for elk on WDFW and other public lands.

Problem: Elk habitat enhancement needs are important on WDFW lands and other public lands where significant improvements can be made with increased funding.

Strategies:

- a. Continue to develop and encourage partnership projects to improve elk habitat with the Rocky Mountain Elk Foundation and Blue Mountains Elk Initiative.
- b. Participate in District Team efforts to coordinate and prioritize projects to improve elk habitat.
- c. In GMU-157, continue to work with the City of Walla Walla to improve habitat conditions and control elk populations.

IX. Spending Priorities

- A. Composition surveys:** The WDFW and co-management partners should seek adequate funding to conduct annual population surveys, with the objective being to obtain precise and accurate data on population parameters required for management: pre and post-season composition, and data required for population modeling.
Priority: High - Basic biological data collection is essential for responsible management of the Blue Mountains Elk Herd.
Time line: Maintain and conduct annual surveys.
Costs: Pre-season surveys will require 50 person-days if ground surveying is used, or 10 hours of helicopter time if aerial surveys are used (\$3,500). Post-season aerial surveys will require 30 hours of helicopter time in order to cover 70% of the survey zones; approximate cost \$10,500.
- B. Human/elk conflicts:** Elk/landowner conflicts and agricultural damage are a major problem in the Blue Mountains and a continuous threat to this elk population. The elk fence should be a high priority in the capital budget, with annual maintenance scheduled and contracted. The elk fence should be extended for approximately two miles on the east end to prevent elk from going around the fence on to agricultural land. Additional one-way gates may also be needed. Elk herders should be included in the annual budget to assist with elk/landowner conflicts in the spring, summer, and winter. Funding should be budgeted for helicopter time (minimum of \$3,000/year) necessary to deal with specific elk herding operations.
Priority: High
Time line: Implemented within the next three years.
Costs: Fence construction \$60,000 per mile.
Annual maintenance \$20,000 per year.
Elk herders \$10,000 annually.
Helicopter herding \$ 3,000 annually.
- C. Habitat improvement:** The WDFW should continue to identify areas where habitat improvement projects can be initiated to improve elk populations and control damage. Money should be prioritized for the matching funds necessary to meet partnership needs for projects with the RMEF and the Elk Initiative. Project development will center around forage enhancement projects on private, WDFW, and USFS lands.
Priority: High
Time line: Maintain annually through Rocky Mountain Elk Foundation and Blue Mt. elk initiative.
Costs: \$5,000 to \$10,000 annually.
- D. Gain management control of habitat:** Key areas of elk winter range should be identified and given a high priority in future land acquisitions or easements.
1. GMU-172 Mt. View: acquire or lease lands on Grouse Flats, Mallory Ridge, and other priority sites.
Priority:
Time line:
Cost:

2. GMU-166 Tucannon: acquire or lease Tumalum drainage, and lands adjacent to the Wooten WA on Maloney Mountain.

Priority:

Time line:

Cost:

3. GMU-175 Lick Creek: acquire or lease private lands adjacent to the Asotin WA.

Priority:

Time line:

Cost:

E. Elk Augmentation:

Priority:

Time line:

Cost:

F. Improve Collection of Hunter Harvest and Effort Information:

Priority:

Time line:

Cost:

X Plan Review and Maintenance

XI Acknowledgements

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Appendix 1. Elk harvest and hunter trends for the Blue Mountains herd, 1952-98.

Year	Antlered	Antlerless	Total	Hunters	Hunter Days
1952	355	311	666		
1953	529	605	1,134		
1954	368	325	693		
1955	621	558	1,189		
1956	693	729	1,422		
1957	795	672	1,487		
1958	623	782	1,405		
1959	662	751	1,413		
1960	760	802	1,562		
1961	731	699	1,430		
1962	760	690	1,450		
1963	626	530	1,156		
1964	1,062	641	1,703		
1965	1,009	673	1,682		
1966	935	1,297	2,232		
1967	817	970	1,787		
1968	1,052	730	1,782		
1969	925	760	1,685		
1970	981	331	1,312		
1971	1,068	333	1,401		
1972	1,226	434	1,660		
1973	1,320	1,040	2,360		
1974	1,278	1,230	2,508		
1975	1,065	710	1,775		
1976	1,230	890	2,120		
1977	1,200	770	1,970		
1978	1,280	770	2,050		

Year	Antlered	Antlerless	Total	Hunters	Hunter Days
1979	1,240	660	1,900		
1980	1,610	535	2,145		
1981	1,451	710	2,161		
1982	1,176	606	1,782		
1983	1,032	562	1,594		
1984	813	548	1,361	11,506	48,217
1985	831	391	1,222	13,452	51,857
1986	701	436	1,137	11,763	51,439
1987	799	688	1,487	12,581	53,717
1988	614	481	1,095	12,131	51,586
1989	358	583	941	10,174	41,291
1990	307	436	743		
1991	242	281	523	9,395	41,386
1992	356	243	599	10,023	39,664
1993	269	212	481	9,583	40,996
1994	305	167	472	9,788	36,290
1995	235	15	250	6,265	24,586
1996	208	107	315	6,463	23,226
1997	380	57	437	6,151	26,053
1998	148	61	209	5,501	21,769

Appendix 2

1996 -99 ELK AGRICULTURAL DAMAGE CLAIMS

County	Date	Species	Crop	Claim	Paid	Status
Asotin	10-01-96	Elk	Unk.	Unk.	Na	Refused
Garfield	11-24-96	Elk	Wheat	\$620.50	\$610.50	Paid
Asotin	1-24-97	Elk	Hay Stack	\$200.00	\$150.00	Paid
Asotin	1-27-97	Elk - Deer	Hay Stack	\$216.00	\$216.00	Paid
Asotin	1-25-97	Elk	Barley	\$3,750.40	\$2,800.00	Paid
Asotin	8-28-97	Elk	Barley	\$454.50	\$454.50	Paid
Asotin	10-20-97	Elk	Wheat	\$364.12	\$331.12	Paid
Asotin	10-14-97	Elk	Hay	\$103.68	\$103.68	Paid
Columbia	9-12-97	Elk-Deer	Wheat	\$29,600.00	\$1,872.00	Paid
Columbia	9-12-97	Elk-Deer	Wheat	\$10,800.00	\$8,075.68	Paid
Columbia	7-25-97	Elk-Deer	Peas	\$6,360.24	\$6,360.24	Paid
Columbia	7-25-97	Elk-Deer	Peas	\$990.18	\$990.18	Paid
Garfield	9-29-97	Elk	Wheat	\$1,185.00	\$1,185.00	Paid
Walla Walla	11-3-97	Elk	Wheat	\$6,868.00		Refused
Walla Walla	11-3-97	Elk	Peas	\$8,300.00		Refused
Asotin	3-18-98	Elk-Deer	Alfalfa	\$1,000.00	\$427.50	Paid
Columbia	8-17-98	Elk-Deer	Wheat	\$200.00	\$200.00	Paid
Columbia	8-26-98	Elk	Wheat	\$500.00	\$500.00	Paid
Columbia	8-31-98	Elk	Wheat-Oat	\$2,500.00	\$2,037.80	Paid
Columbia	8-31-98	Elk	Barley	\$1,000.00	\$407.74	Paid
Columbia	10-08-98	Elk	Unk	Unk.		Refused
Garfield	8-31-98	Elk	Barley	\$207.60	\$207.60	Paid
Walla Walla	9-13-98	Elk	Barley	\$266.66	\$206.66	Paid
Walla Walla	8-28-98	Elk				Refused
Total				\$75,486.88	\$26,728.46	35% Paid

Appendix 2 (continued)

1999 AGRICULTURAL ELK DAMAGE CLAIMS

County	Date	Species	Crop	Claim	Paid	Status
Asotin	9-10-99	Elk	Hay	\$543.00		
Columbia	8-02-99	Elk	Peas	Unk		Refused
Columbia	8-02-99	Elk	Wheat	Unk.		Refused
Columbia	8-02-99	Elk	Barley	Unk.		Refused
Columbia	8-16-99	Elk	Peas	\$4,985.79		
Columbia	9-20-99	Elk-Deer	Wheat	\$5,000.00		
Columbia	9-20-99	Elk-Deer	Barley	\$3,000.00		
Garfield	9-27-99	Elk	Wheat	\$1,304.60		
Garfield	9-06-99	Elk	Wheat	\$1,914.00	\$1,914.00	
Walla Walla	9-03-99	Elk-Deer	Wheat	\$3,000.00		
Walla Walla	8-23-99	Elk	Peas	\$4,125.00		

ELK DAMAGE CLAIMS-ANNUAL SUMMARY

YEAR	NO. CLAIMS	AMOUNT CLAIMS	NO. PAID	AMOUNT PAID	CLAIMS REFUSED
1996	2	\$620.50	1	\$610.50	1
1997	13	\$69,192.12	11	\$22,538.40	2
1998	9	\$5,674.26	7	\$3,987.30	2
1999	11	\$23,872.39			3
TOTAL	35	\$99,359.27			

APPENDIX 3 ELK DAMAGE HARVEST HISTORY

HOTSPOT HUNT/LANDOWNER PREFERENCE/KILL PERMIT HARVEST HISTORY

YEAR	HOTSPOT ELK	L/O PREFERENCE. ELK	KILL PERMIT ELK	TOTAL DAMAGE ELK
1991-92	3	1	unk.	4
1992-93	39*	4	unk.	43
1993-94	13	1	unk.	14
1995	unk.	unk.	unk.	----
1996	29	5	3	37
1997	5	0	1	6
1998	46	0	3	49
1999	9	3	0	12
TOTAL	144	14	7	165

* Damage hunts are restricted to antlerless elk only.

APPENDIX 4 Blue Mountain Rocky Mountain Elk Foundation Projects

Year	Project	RMEF Funds	Yearly Totals
1987	Stumbaugh Ridge Burn	\$3,465.00	\$3,465.00
1988	Cook Ridge Fertilization Project	\$1,000.00	\$1,000.00
1989	Pomeroy Burn	\$6,000.00	\$6,000.00
1990	Tucannon #3 and Eckler burn, reseed	\$3,000.00	\$12,170.00
	Blue Mountain Elk Study (Elk Depredation)	\$5,000.00	
	Blue Mountain Elk Reproduction Study	\$4,170.00	
1991	Jim Creek Weed Control	\$1,250.00	\$1,250.00
1992	Hatchery Ridge Prescribed Burns	\$5,500.00	\$5,500.00
1993	Pomeroy Ranger District Salting (year 1)	\$2,000.00	\$17,555.00
	Blue Mountains Elk Mortality Study	\$8,000.00	
	Cottonwood Prescribed Burn	\$5,555.00	
	Pomeroy Ranger District Salting (year 2)	\$2,000.00	
1994	Blue Mountains Elk Calf Mortality Study (year 2)	\$8,000.00	\$27,900.00
	Miller Shingle Forage Enhancement	\$19,900.00	
1995	Blue Mountains Salting Project (year 3)	\$2,000.00	\$31,500.00
	Blue Mountains Elk Calf Mortality Study (year 3)	\$9,500.00	
	Miller Shingle Forage Enhancement	\$20,000.00	
1996	Pasture Winter Range Burn	\$2,500.00	\$23,500.00
	Winter Range Noxious Weed Control	\$5,250.00	
	Abels Ridge Winter Range Burn	\$2,500.00	
	Case Horn Winter Range Burn	\$5,250.00	
	Lick Creek Winter Range Burn	\$5,000.00	
	Water Pond Development (West Tucannon)	\$3,000.00	
1997	Sourdough Yellow Star Thistle Control	\$1,500.00	\$18,750.00
	Wooten Forage Enhancement	\$5,000.00	
	Asotin Creek Range Fertilization	\$6,000.00	

Year	Project	RMEF Funds	Yearly Totals
	Wooten Weed Control	\$6,250.00	
1998	Asotin Creek Wildlife Area Fertilization	\$3,500.00	\$37,750.00
	Wooten Weed Control	\$6,250.00	
	Wooten Wildlife Area Field Restoration	\$5,000.00	
	Brachen Yellow Star Thistle Treatment	\$8,000.00	
	Lewis Creek Elk Burn	\$15,000.00	
1999	Meadow Prescribed Fire Vegetation Response Study	\$1,750.00	\$52,550.00
	Moonshine Winter Range Burn	\$4,000.00	
	Upper Tucannon Burn	\$15,000.00	
	Asotin Creek Fertilization	\$1,800.00	
	Asotin Creek Area Weed Control	\$5,000.00	
	Walla Walla Yellow Star Thistle	\$2,500.00	
	North Fork Asotin Creek Burn	\$5,000.00	
	Mt. Horrible Burn	\$17,500.00	
2000	Middle Tucannon Yellow Star Thistle	\$3,700.00	\$20,800.00
	Cottonwood Winter Range Burn	\$4,000.00	
	Meadow Prescribed Fire Vegetation	\$1,100.00	
	Tallow Tail Burn	\$12,000.00	
<i>Total RMEF Funding for Blue Mountains Projects 1987-2000</i>			<i>\$259,690.00</i>

APPENDIX 5

POST HUNTING SEASON ELK HERD COMPOSITION-POPULATION TREND SURVEY SUMMARY

(Surveys are conducted in March)

(March) YEAR	DATE(S)	SURVEY TYPE	TOTAL OBSERVED	TOTAL CLASSIFIED	ADULT BULLS	SPIKE BULLS	RAGHOR N BULLS	TOTAL BULLS	COW S	CALVE S	RATIO B/COW/CA
1985	3/5-4/5	Helicopter/FW	3770	1852	13	63	Na	76	1297	479	6 / 100 / 37
1986	2/28-3/27	Helicopter\FW	4627	3030	25	67	Na	92	2291	647	4 / 100 / 28
1987	3/14-28.	Helicopter/FW	3879	2060	27	70	Na	97	1454	509	7 / 100 / 35
1988	3/8-16	Helicopter/FW	3289	2962	24	107	Na	131	2151	680	6 / 100 / 32
1989	3/21-30	Helicopter/FW	4878	4196	41	119	Na	160	3318	718	5 / 100 / 24
1990	3/ 5-10	Helicopter	3706	3706	86	140	Na	226	2777	703	8 / 100 / 25
1991	3/20-28	Helicopter	4072	4072	195	137	Na	469	2922	818	11 / 100 / 28
1992	3/15-20	Helicopter	3560	3560	276	155	Na	431	2660	469	16 / 100 / 18
1993	3/15-19	Helicopter	4092	4092	261	139	Na	400	3103	589	13 / 100 / 19
1994	3/13-18	Helicopter	3163	3161	240	91	Na	331	2395	435	14 / 100 / 18
1995	3/14-19	Helicopter	3689	3689	354	111	Na	465	2690	534	17 / 100 / 20
1996	3/11-15	Helicopter	3656	3656	307	82	Na	389	2836	431	14 / 100 / 15
1997	3/22-26	Helicopter	3405	3405	164	87	69	320	2487	598	13 / 100 / 24
1998	3/11-18	Helicopter	3118	3118	123	54	89	266	2325	527	11 / 100 / 23
1999	3/23-26	Helicopter	3615	3615	166	121	66	353	2663	599	13 / 100 / 23
2000	3/20-23	Helicopter	3628	3628	178	92	68	338	2806	484	12 / 100 / 17