

Washington State Elk Herd Plan

SOUTH RAINIER ELK HERD

Washington Department of Fish and Wildlife
Wildlife Program
600 Capitol Way North
Olympia, WA 98501-1091

Prepared by
Min T. Huang
Patrick J. Miller
Frederick C. Dobler

January 2002

Director, Washington Department of Fish and Wildlife

Date

STATE OF WASHINGTON

GARY LOCKE, GOVERNOR

DEPARTMENT OF FISH AND WILDLIFE
JEFF KOENINGS, PH. D., DIRECTOR

WILDLIFE PROGRAM
DAVE BRITTELL, ASSISTANT DIRECTOR

GAME DIVISION
DAVE WARE, MANAGER

This Program Receives Federal Aid in Wildlife Restoration funds.
Project W-96-R-10, Category A, Project 1, Job 4

This report should be cited as:
Washington Department of Fish and Wildlife. 2002. South Rainier Elk Herd Plan. Wildlife
Program, Washington Department of Fish and Wildlife, Olympia. 32 pp.

This program receives Federal financial assistance from the U.S. Fish and Wildlife Service Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972. The U.S. Department of the Interior and its bureaus prohibit discrimination on the bases of race, color, national origin, age, disability and sex. If you believe that you have been discriminated against in any program, activity or facility, please write to: U.S. Fish and Wildlife Service, Office of External Programs, 4040 N. Fairfax Drive, Suite 130, Arlington, VA 22203

TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	iv
EXECUTIVE SUMMARY.....	v
INTRODUCTION.....	1
The Plan.....	1
The Herd.....	1
HERD AREA DESCRIPTION.....	1
Location.....	1
Land Ownership.....	3
Topography.....	3
Vegetation.....	3
Human Influences.....	3
Other Related Species.....	4
HERD DISTRIBUTION.....	4
Historic Distribution.....	4
Current Distribution.....	5
Proposed Distribution.....	5
HERD MANAGEMENT.....	6
History, Status and Management Activities.....	6
Estimated Population Size.....	7
Herd Composition.....	8
Mortality.....	9
SOCIAL AND ECONOMIC VALUES.....	10
Number of Elk Hunters and Elk Hunter Days.....	10
Harvest Strategies.....	11
Damage.....	12
Tribal Hunting.....	13
Non-consumptive Use.....	13
HABITAT MANAGEMENT.....	13
Limitations and Losses.....	13
Enhancement and Improvement Projects/Ideas.....	14
RESEARCH NEEDS.....	15
HERD MANAGEMENT GOALS.....	16
MANAGEMENT OBJECTIVES, PROBLEMS AND STRATEGIES.....	16
Herd Management.....	16
Objective # 1.....	16
Objective # 2.....	17
Objective # 3.....	17
Objective # 4.....	18
Objective # 5.....	18
Habitat Management.....	18
Objective # 1.....	18
Objective # 2.....	19
Objective #3.....	19
Objective #4.....	19

SPENDING PRIORITIES.....	20
Priority # 1 Pre-hunting season composition surveys.....	20
Priority # 2 Improve state recreational and tribal harvest data collection.....	20
Priority # 3 Secure and enhance more winter habitat.....	20
Priority # 4 Post-hunting season composition surveys.....	21
Priority # 5 Increase enforcement emphasis.....	21
PLAN REVIEW AND MAINTENANCE.....	21
LITERATURE CITED.....	22
APPENDIX A. Elk Hunting Seasons for the South Rainier Herd.....	24
APPENDIX B. Management Authority for Controlling Elk Damage (RCW, Title 77).....	28

List of Maps and Figures

Map 1. Selkirk Elk Herd Area.....	2
Map 2. South Rainier Elk Herd Distribution	6
Figure 1. Estimated total elk population for the South Rainier herd.....	7

List of Tables

Table 1. History of elk releases in the range of the South Rainier Elk Herd.....	5
Table 2. Preseason aerial elk composition data from South Rainier Elk Herd, 1996-1999.....	8
Table 3. Elk harvest from the South Rainier Herd, 1991-1999.....	10
Table 4. General firearm bull seasons antler restriction (1991-2000) for the South Rainier Elk Herd.....	11
Table 5. Summary of elk damage complaints associated with South Rainier Elk Herd....	12
Table 6. Habitat enhancement projects conducted for South Rainier Elk Herd, east of SR 7.....	14

ACKNOWLEDGEMENTS

Region 5 wildlife program staff prepared the South Rainier elk herd plan. Wildlife Biologist Min Huang was the lead author assisted by Patrick Miller, District Wildlife Biologist and Fred Dobler, Regional Wildlife Program Manager. Region 6 wildlife staff also participated since part of the South Rainier elk herd area is within Region 6. Dave Ware, Game Division Manager and George Tsukamoto, Staff Biologist in Olympia also assisted in the development of the plan. We appreciate the expertise provided by Rolf Johnson, deer and elk Section Manager and Louis Bender, Statewide Deer and Elk Specialist. Many other WDFW personnel provided valuable assistance and reviewed comments during the development of the plan.

We are especially indebted to Medicine Creek Treaty Tribes (Muckleshoot, Nisqually, Puyallup, and Squaxin Island Tribes) for their willingness to cooperate and contribute to the development of this plan. The wildlife technical staff, David Vales, Michael MacDonald, and Chris Madsen from the tribes were particularly helpful in preparation of the plan and providing input during the review process.

SOUTH RAINIER ELK HERD PLAN

EXECUTIVE SUMMARY

The South Rainier elk herd is one of ten herds residing in the State. It is an important resource that provides significant recreational, aesthetic and economic benefit to Washington citizens and is a valued cultural, subsistence, and ceremonial resource to the Native American people of the area.

This plan's purpose is to provide direction for managing the South Rainier elk resource into the future. This is a five-year plan subject to amendment. Before the fifth year this plan should be updated, re-evaluated, amended and implemented for another five-year period. It will be a valuable reference document and guideline for the Washington Department of Fish and Wildlife, Tribes, agency cooperators, landowners and the general public. Priority management activities will be implemented as funding and resources become available.

Three primary goals guide the South Rainier Elk Herd Plan: (1) to manage this elk herd for a 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; and (3) to manage and enhance elk and their habitats to ensure healthy, productive populations.

Specific elk herd and habitat management objectives, problems and strategies are identified in this plan. Priority objectives address specific problems in managing this elk herd and a variety of strategies have been developed to solve these problems. The following objectives have been identified:

- Manage the South Rainier Elk Herd using the best available science.
- Increase the estimated elk population in the eastern half of its range from about 1,700 to approximately 2,500 elk, in keeping with habitat limitations and landowner tolerance.
- Manage all game management units for bull ratios consistent with the statewide plan (currently greater than or equal to 12 bulls per 100 cows post-season) in combination with overall bull mortality rates less than or equal to 50 percent.
- Minimize elk damage to private property.
- Encourage maintaining the current amount and quality of elk habitat on U.S. Forest Service lands (no net loss).
- Maintain the current amount of elk winter range along the Cowlitz and Skookumchuck rivers and the Hanaford Creek area.
- Develop diverse private/public partnerships to improve habitat and management of elk.

Spending priorities have also been identified for the first five years. Achieving spending levels will be contingent upon available funds and the creation of partnerships. The recommended prioritized expenditures for the South Rainier Elk Herd are as follows:

<u>Priority Expenditures</u>	<u>1st Year</u>	<u>5 Years</u>
Pre-hunting season composition surveys	\$6,000.00	\$30,000.00
Improve state and tribal harvest data collection	\$12,000.00	\$60,000.00
Secure and enhance elk winter habitats	\$50,000.00	\$250,000.00
Post-hunting season composition surveys	\$3,000.00	\$15,000.00
Increase enforcement emphasis patrols	<u>\$10,000.00</u>	<u>\$50,000.00</u>
Total	\$81,000.00	\$405,000.00

SOUTH RAINIER ELK HERD PLAN

INTRODUCTION

The Plan

The South Rainier Elk Herd Plan provides the historical background, current conditions and trends for this important natural resource. This plan is essentially an assessment document that identifies management problems, develops solutions to overcome these problems, and sets direction. It outlines goals, objectives, problems, and strategies and helps establish priorities to resolve management issues concerning this elk herd. It also provides a readily accessible resource for biological information collected from the herd and identifies the current inadequacies of this scientific information.

This plan is a one of ten elk herd plans under the umbrella of the Washington State Management Plan for Elk (Washington Department of Fish and Wildlife 1997) and the Environmental Impact Statement for Elk Management (Washington Department of Fish and Wildlife 1996). It is a five-year planning document subject to annual review and amendment. Once approved, this plan will remain in effect as amended or until canceled. The Washington Department of Fish and Wildlife recognizes the sovereign status of federally recognized treaty tribes. This document recognizes the responsibility of the Washington Department of Fish and Wildlife and Medicine Creek Treaty Tribes to cooperate and collaborate. It also recognizes the role that private landowners and public land management agencies, notably the U.S. Forest Service, U.S. National Park Service, and Washington Department of Natural Resources, play in assisting to manage and sustain this elk herd

The Herd

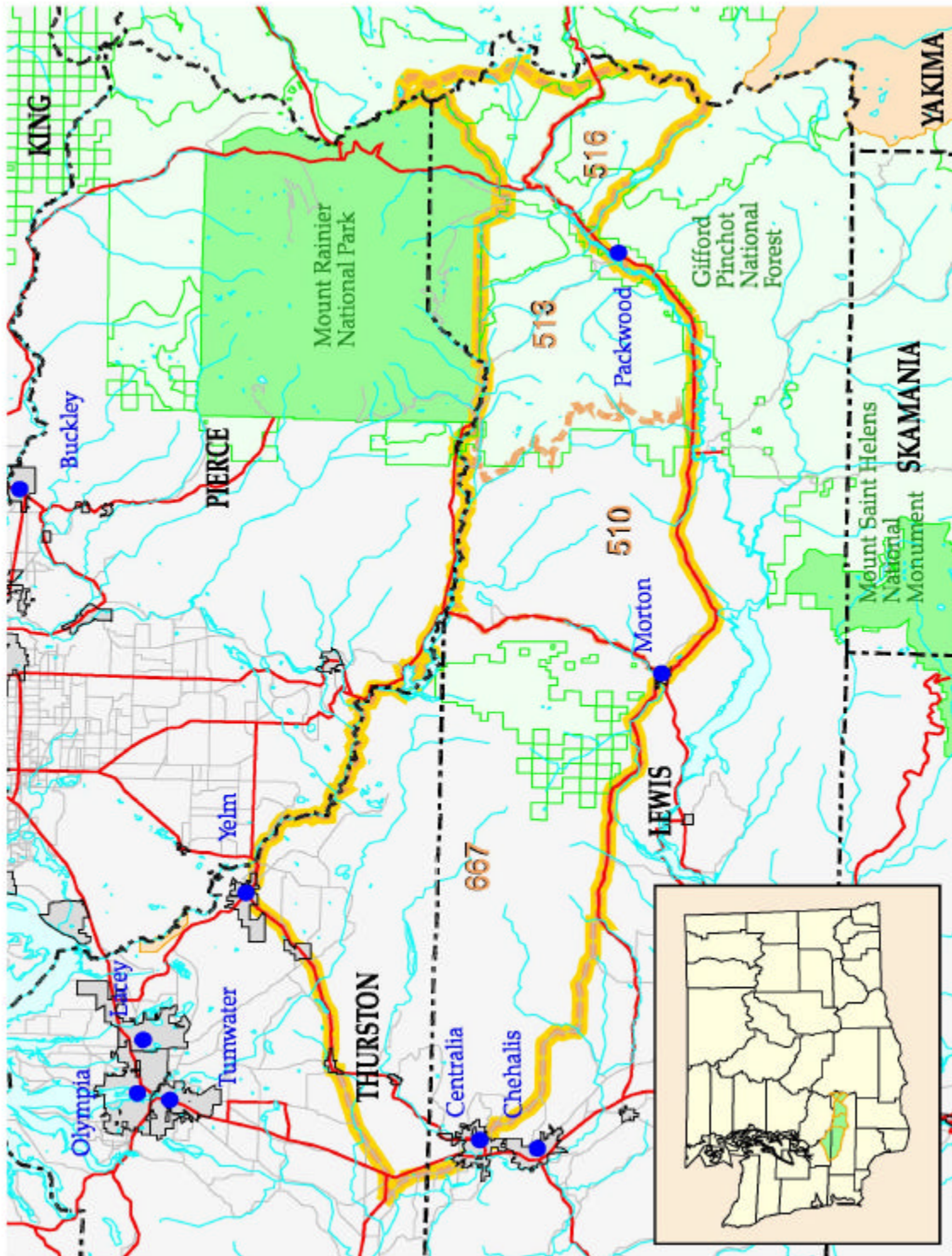
For management and administrative purposes the state has been divided into numerous Game Management Units (GMUs). The South Rainier elk herd is one of ten herds found in Washington. In this context an elk herd is defined as a population within a recognized boundary as described by a combination of GMUs. The South Rainier Elk Herd includes the following GMUs: 510 (Stormking), 513 (South Rainier), that portion of 516 (Packwood) that lies north of Lake Creek, Packwood Lake, and Upper Lake Creek, extending to the Pacific Crest Trail, and 667 (Skookumchuck).

HERD AREA DESCRIPTION

Location

The range of the South Rainier elk (*Cervus elaphus*) herd encompasses approximately 2,900 square kilometers (1,100 square miles) and is situated in parts of four GMUs in northeastern Lewis County, one in central Lewis/southeastern Thurston Counties, and in Mount Rainier National Park (Map 1).

Map 1. South Rainier Elk Herd Area



The South Rainier herd area is bounded by the North Cascade Crest Trail on the east, Lake Creek and Packwood Lake to the Cowlitz River and Highway 12 to Morton and Highway 508 to Centralia on the south, the Centralia-Alpha Road and Interstate Highway 5 on the west, and the Bucoda - Tenino Road, State Highway 507, the Nisqually River and Mt. Rainier National Park on the north. The South Rainier herd also includes elk from Mt. Rainier National Park roughly from Fryingpan Creek south (Bradley 1982).

Land Ownership

Land ownership in the herd area is varied. The primary landowner is the U.S. Forest Service, which administers approximately 1,100 square kilometers (400 square miles) of land in the herd area, primarily within the Gifford Pinchot National Forest. Mt. Rainier National Park's southern boundary includes the northern fringe of the herd area. Small, private holdings, principally along the Cowlitz River, and smaller tracts of state and privately owned industrial forestland comprise the remainder of the herd area.

Topography

The area is entirely within the Southern Washington Cascade Physiographic Province (Franklin and Dyrness 1973). Elevations in the South Rainier herd area range from about 75 meters (250 feet) along the Skookumchuck River to about 4,400 meters (14,400 feet) at the summit of Mt. Rainier. The entire area is in the Cascade Mountains, and consists of moderate to steep topography. Level to gently rolling terrain occurs only along the major drainages, primarily the Cowlitz and Cispus rivers. Elk use virtually the entire herd area below approximately 2,000 meters (6,500 feet), with the exception of extremely steep rocky terrain.

Vegetation

Three major forest zones exist in this herd area, arranging themselves along elevational and moisture gradients (Franklin and Dyrness 1973). These zones are named after the climax conifer tree species and are, in order of increasing elevation: the western hemlock (*Tsuga heterophylla*), Pacific silver fir (*Abies amabilis*), and mountain hemlock (*T. mertensiana*) zones. Differences in aspect, soil type, and slope account for diversity within each of the major forest zones. This may be reflected in different dominant and co-dominant tree species, and a variety of understory vegetation.

Human Influences

Human recreational use of the South Rainier herd area is high. Mount Rainier National Park visitor use exceeded two million in the 1990's (Walkinshaw 1999) with the majority (46%) accessing from the Nisqually slope located on the south entrance to the park. Hiking, back-country camping, cross-country skiing, and other non-consumptive uses occur throughout the year in both Mt. Rainier National Park and the Gifford Pinchot National Forest. Fishing, hunting, and trapping also occur extensively throughout the forest and adjacent privately owned lands.

Extensive residential and agricultural developments along the Cowlitz River have affected the principal wintering area of the South Rainier herd. The results include both a loss of key winter habitat for the South Rainier herd as well as increased conflicts between humans and elk. Intensive logging, virtually all by clear cutting, has greatly changed the character and structure of all forests outside of the national park. Originally the area was almost an unbroken green blanket of forest, most areas today are a patchwork of clear-cuts and stands of various aged trees. The change from old growth forest (due to clear cut logging) to second and third generation tree re-growth is almost complete within the lower elevation western hemlock zone. This zone reaches to approximately 1,000 meters (3,300 feet) in the herd area and includes all of the winter range for these elk.

The greatest human influence on the South Rainier herd has been through direct mortality. Statewide and probably representative of the South Rainier elk herd, regulated hunting harvest alone removes from 40 to 60 percent of all bull elk annually.

Other Related Species

The entire range of the South Rainier elk herd is also used by an estimated 11,000 black-tailed deer (*Odocoileus hemionus columbianus*). Mountain goat (*Oreamnos americanus*) occupy high-elevation rugged terrain throughout the South Rainier elk herd area, particularly along Tatoosh, Backbone, Cascade Crest, and Carlton ridges. Mountain goats and elk segregate during most of the year, due to the mountain goat's preference for steep, rocky terrain. During summer, both species occupy high elevation meadows. Domestic livestock, primarily cattle and horses, are common on elk winter habitat along the Cowlitz River.

HERD DISTRIBUTION

Historic Distribution

The South Rainier herd area is within the original range of the Roosevelt subspecies of the North American elk (*C. e. roosevelti*). There has been some controversy as to whether elk originally lived in this area. Bradley (1982) found no evidence that elk were part of the resident fauna when Mt. Rainier National Park was established in 1899. By the late 1800s, however, Roosevelt elk had already been largely eliminated from much of their former range. Citing archaeological and anthropological evidence, Schullery (1984) concluded that elk were present in the national park area prior to non-tribal settlement.

It is generally accepted that elk populations in the herd area have increased due to various introductions of Rocky Mountain elk (*C. e. nelsoni*) from Montana's Yellowstone National Park. These releases began in the early 1900s and continued through 1939 (Pautzke et. al. 1939). The introductions having the most direct effect on the South Rainier elk herd occurred from 1913 to 1915 in the Bethel Ridge area and from releases from 1932 to 1933 between the western boundary of the national park and the town of Eatonville (Table 1).

Table 1. History of Elk Releases in the Range of the South Rainier Elk Herd.

Date	Release Location	Number Released	Origin
January 20, 1913	Naches River	50 (42 Cows, 8 Bulls)	Montana
Winter 1932	Eatonville	30	Montana

Records from Mt. Rainier National Park indicate low elk numbers there until the 1950s when the elk population increased significantly. This coincided with logging activities outside of the park, which improved the habitat carrying capacity on elk winter ranges by providing more open areas where edible grass and shrubs could grow and become essential elk winter food.

Elk appeared in the Skookumchuck River drainage in the late 1970s when a small number were discovered on Centralia Mine land south of the town of Tenino. Mine staff planted grasses and forbs on their reclaimed lands. The mine was closed to the public, and grass growing on the re-vegetated mining lands produced ideal conditions for the elk herd's growth.

Current Distribution

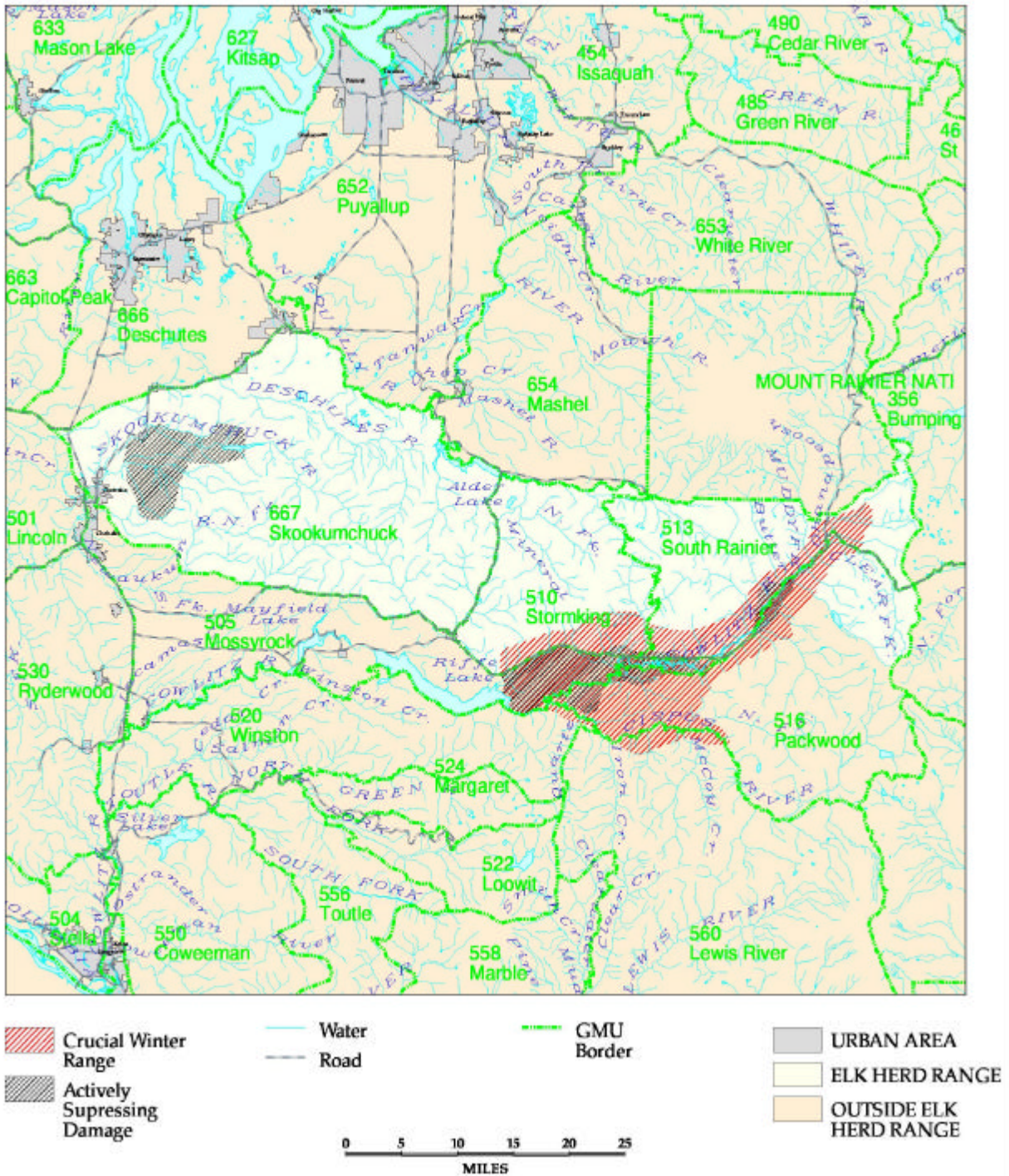
Elk numbers are highest in the Packwood (GMU 516) unit. Recently, elk have expanded their range into the Stormking (GMU 510) unit, but its steep topography makes high elk densities unlikely, despite adequate food and cover. Elk numbers in the Cowlitz and Cispus river valleys are highest during the late fall and winter as migratory groups move to lower elevations outside of Mt. Rainier National Park. These migratory park elk use winter ranges in the former Tatoosh and Sawtooth units (now GMU 513, South Rainier). As Forest Service lands outside of Mt. Rainier National Park were logged (creating a more open and favorable habitat mix for elk) many large groups of elk remained outside the park year-round and are now considered local residents.

The existence of these groups of local resident elk complicates making a clear delineation between summer and winter ranges in the South Rainier herd area. Many elk remain below 915 meters (3,000 feet) for the entire year, whereas other groups move from their summer ranges in high alpine meadows at 1,830 meters (6,000 feet) down to the valley floor during the winters. The winter range of the South Rainier herd in general, however, can be broadly classified as suitable habitat below 854 meters (2,800 feet) (Map 2). Elk in the Skookumchuck River watershed (the Skookumchuck sub-herd) reside primarily south of the Skookumchuck Reservoir and on or near the Centralia Mine south of Tenino. Some of these animals have dispersed north onto the Fort Lewis Military Reservation and are essentially non-migratory.

Proposed Distribution

No landscape-scale changes that would affect the distribution of the South Rainier herd are anticipated. However, urbanization has increased the number of elk/human conflicts throughout this herd's range. In response, current management practices strive to reduce or eliminate elk in damage-prone areas (Map 2). Thus, localized reductions in elk numbers may occur; however, the overall distribution of the herd will remain much the same.

Map 2. South Rainier Elk Herd Distribution



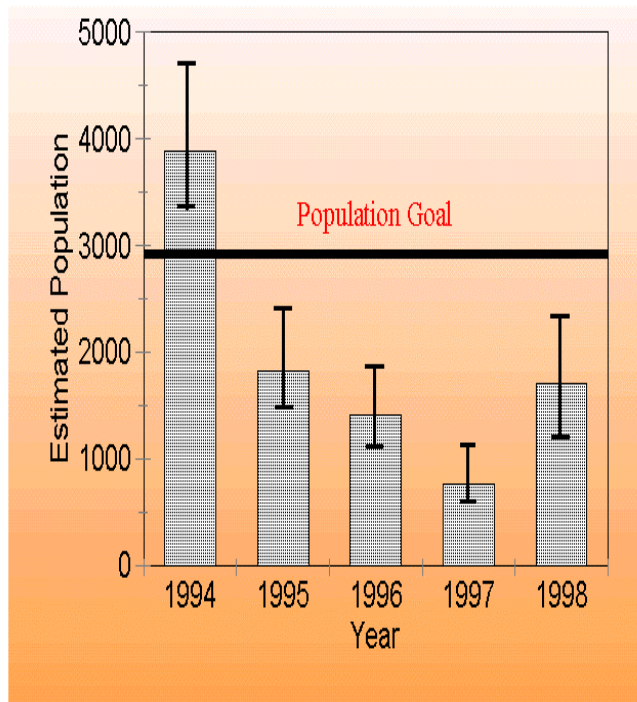
HERD MANAGEMENT

History, Status and Management Activities

The Cascade sub-herd east of State Highway 7 (GMUs 510, 513 and part of 516) has decreased from approximately 3,800 elk in 1994 to just over 1,700 (± 350 at 90% CI) elk in 1998, about a

39 percent drop (Figure 1). A 1999 survey indicated that the elk from the southern portion of Mount Rainier National Park, however, has remained stable or increased since 1996. The Skookumchuck sub-herd west of State Highway 7 (GMU 667) has also remained stable over this period, averaging about 400 animals.

Figure 1. Estimated total elk population (90% CI) for the South Rainier herd from 1994-1998, using the population reconstruction method.



Estimated Population Size

Elk population estimates are derived from a modified population reconstruction method (Bender and Spencer 1999), using data from elk herd demographics and harvest estimates. From those calculations, we estimate that the current population of this herd is approximately 2,100 elk. The Cascade sub-herd contains roughly 1,700 elk, while the Skookumchuck sub-herd is about 400 elk strong. An unknown number of park elk also contribute to the herd's overall numbers.

The population objective is to increase the South Rainier herd to about 3,000 elk. To do that, the Cascade sub-herd needs to increase from its present level of around 1,700 animals to its 1996 level of approximately 2,500 elk. The objective for the Skookumchuck sub-herd is to maintain elk numbers at about 400. Elk populations will be maintained or increased, except in damage-prone areas. A variety of management strategies to deal with damage in the western part of GMU 667 will be evaluated.

Herd Composition

In western Washington, elk herd composition surveys are conducted prior to hunting season's (September), because this is when the most unbiased information can be obtained. In eastern Washington, post-hunting season (March) surveys are conducted.

Preseason bull:cow ratios for the Cascade sub-herd (GMUs 510, 513 and part of 516) have averaged 17 bulls per 100 cows since 1996 (Table 2). In comparison, data from GMUs with similar historic harvest regimes have averaged 25 bulls per 100 cows from preseason surveys. Survey coverage and subsequent sample sizes, however, have been sparse. Calf production, based on these fall surveys has averaged 48 calves per 100 cows.

Preseason bull:cow ratios for the Skookumchuck sub-herd (GMU 667) averaged 15 bulls per 100 cows during 1998 and 1999 (Table 2). Sample sizes in this unit have also been small and geographic coverage generally limited. Preseason calf production over this same period has averaged 46 calves per 100 cows.

Table 2. Preseason Aerial Elk Composition Data from South Rainier Elk Herd, 1996-1999.

YEAR	DATE (S)	GMU	TOTAL OBSER.	TOTAL CLASS.	ADULT BULLS	SPIKE BULLS	RAG- HORN BULLS	TOTAL BULLS	COWS	CALVES	RATIO Bull/100cow/calf
1996	Fall	516	28	28	2	2	0	4	18	6	22/100/33
1996	Fall	512	50	50	0	0	0	0	32	18	? /100/56
1997	Fall	516	95	95	1	7	3	11	56	28	20/100/50
1997	Fall	513	2	2	0	0	0	0	2	0	
1998	Oct 5	667	29	29	1	4	0	5	17	7	29/100/41
1999	Oct 14	516	34	34	0	4	2	6	19	9	32/100/47
1999	Sept 24	667	37	37	1	0	0	1	24	12	04/100/50

Using harvest estimates and other estimates of mortality, the pre-hunting season composition information for western Washington is then converted to post-hunting season data so it can be compared to statewide post-season objectives. Post-hunting season bull:cow ratios in the Cascade sub-herd have averaged 9 bulls per 100 cows, and have not been calculated in the Skookumchuck sub-herd from the limited samples collected in 1998 and 1999.

The Washington Department of Fish and Wildlife established the current minimum bull elk survivorship goal of 12 bulls per 100 cows based on post-hunting season surveys (Washington Department of Fish and Wildlife 1997). Based upon an analysis completed in early 2000, modeled post-season bull:cow ratios for the Cascade sub-herd are about 9 bulls per 100 cows. This is significantly lower than the current management objective. The current modern firearm general season regulations are three-point minimum for bull elk. While this harvesting strategy is not producing the desired post-season ratios, the three-point minimum regulation has only been in effect since 1998. It remains to be seen whether or not this harvesting strategy will achieve the current goal of 12 bulls per 100 cows in these units.

Calf production has historically been excellent in the South Rainier herd, with the exception of the park elk. Calf production in parks and reserves where hunting is not allowed is generally lower than in areas where hunting occurs (Thomas and Toweill 1982). Pre-season (fall) calf ratios are key, providing an important index of the amount of mortality an elk population can withstand before declining. Ratios greater than 30 calves to 100 cows indicate a minimum cow mortality threshold of about 15 percent, assuming no winter calf mortality. Those same calf:cow ratios can indicate a minimum cow mortality threshold of about 7.5 percent if one assumes 50 percent of the calves die during the winter. A regulated cow elk harvest rate of 2.5 to 5.0 percent has been targeted for the South Rainier herd. Despite both sub-herds having calf:cow ratios considerably greater than 30:100, additional sources of cow mortality such as predation, unreported harvest, poaching, and wounding losses are believed to have resulted in the decline of the Cascade sub-herd.

Mortality

Modeled annual bull mortality rates of the Cascade sub-herd are approximately 71 percent while observed bull mortality rates from surveys are about 62 percent. Due to the paucity of recent, survey data, we feel the modeled rates (71 percent) are likely closer to reality. Without annual survey of the elk herd, modeled demographic parameters may provide the better estimate of actual herd conditions. Modeled mortality rates are derived using annual harvest estimates and a population reconstruction model.

This level of overall bull elk mortality indicates that the South Rainier sub-herd is unable to meet the Department's bull elk escapement objectives of 12 bulls per 100 cows (Washington Department of Fish and Wildlife 1997). To meet Department escapement objectives bull elk mortality must be reduced in the Cascade sub-herd. Alternatively, escapement objectives need to be re-evaluated. Specific non-hunting mortality rates for the South Rainier herd are unknown. However, factors negatively affecting bull and cow survival rates in the Cascade sub-herd may be unreported harvest, wounding, increased predation and poaching. The actual extent and effect of these losses, and their contribution to the observed and modeled bull mortality rates, are unknown. However, poaching may account for more than 15 percent of total mortality found in other parts of Washington (Smith et al. 1994). Modeled cow mortality rates for the period of decline (1994-1997) range from 13 to 25 percent. Mortality rates of this magnitude cannot sustain a population.

Since 1991, estimated state elk harvest of the entire South Rainier herd has averaged 213 animals (range: 98 to 404) with state authorized hunters harvesting a mean of 155 bulls and 64 cows (Table 3). More than half the antlerless harvest over this time period has come from the Skookumchuck sub-herd. Tribal harvest data prior to 1997 are unavailable. Reported tribal harvest for 1997, 1998, and 1999 are also included in Table 3 and range from 17-22 elk.

An increase in reported harvest, in conjunction with unquantified losses from predation, wounding, poaching and unreported harvest, is hypothesized to be the driving factors reducing the Cascade sub-herd's population. Increased monitoring of the South Rainier herd is needed to accurately evaluate the effects of tribal and state authorized hunting on these elk. It was a

commonly held belief that many of the elk harvested by tribal members were migratory animals from Mt. Rainier National Park. Recent surveys indicate that this idea may be false. A 1999 survey conducted in the southern part of the park showed an increase in that portion of the Park's elk population, while the South Rainier herd has been declining. Further clarification is needed to determine what proportion of the elk harvest is made up of local elk, and what proportion is made up of park elk.

Table 3. Elk Harvest From the South Rainier Herd, 1991-1999.

Year	State Hunters (questionnaire data)					Tribal Hunters (tribal reports)		
	Antlered	Antlerless	Total Kill	Total Hunters	Total Days	Antlered	Antlerless	Total Kill
1991	186	92	278	3,931	16,277	-	-	-
1992	145	75	220	3,986	17,122	-	-	-
1993	147	69	216	4,093	16,634	-	-	-
1994	286	118	404	4,983	21,689	-	-	-
1995	143	60	203	5,861	22,600	-	-	-
1996	114	69	183	4,149	17,318	-	-	-
1997	70	28	98	2,667	9,681	6	11	17
1998	139	40	179	3,255	13,108	9	13	22
1999	100	68	168	3,367	18,022	9	8	17
2000	215	19	234	3,499	14,312	9	8	17
Total	1,545	638	2,183	39,971	166,763	24	32	56
Avg.	155	64	218	3,979	16,676	8	11	19

SOCIAL AND ECONOMIC VALUES

Number of Elk Hunters and Elk Hunter Days

In 1999, 3,367 state-authorized hunters spent an estimated 18,022 days afield hunting for South Rainier elk. Hunting pressure has averaged 3,925 hunters since 1991 (Table 3). While the overall trend in hunter effort has declined since its recent peak in 1995 at 5,072 hunters, the trend has been on the rise again starting in 1998. The revenue generated by elk hunters provides a significant economic boost to the local communities within the South Rainier herd's range. 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. 1997). Using this \$860 average expenditure per hunter from the national survey, South Rainier elk hunters added \$2,895,620 to the local and state economy in 1999. This however, is a 42 percent decline from the peak number of elk hunters in 1995. Again, using the

\$860 cost per hunter, this decline in hunter numbers represents a loss of \$2,144,840 in revenue to the local and state economy.

Harvest Strategies

Specific harvest strategy recommendations will be made every three years as a part of the current Fish and Wildlife Commission’s policy of adopting hunting seasons for a three-year period and annually establishing special permit seasons and necessary amendments. The three-year hunting package will serve as the state’s harvest plan. Tribal participation in formulating specific recommendations and harvest strategies begins at the regional level. The Department of Fish and Wildlife’s regional staff and field personnel will meet with tribal representatives to coordinate harvest strategies, share harvest data, and discuss other elk management activities such as habitat enhancements.

Historically, harvest strategies in the units comprising the South Rainier herd have varied considerably since 1970 (Appendix A). Bull elk harvesting strategies have ranged from any bull to spike-only with branched-antlered bull by permit to a three-point minimum bull season (Table 4).

Table 4. General Firearm Bull Seasons Antler Restrictions (1991-2000) for the South Rainier Elk Herd.

YEAR	GMU 510	GMU 512	GMU 513	GMU 514	GMU 516	GMU 667
1991	Any Bull	Any Bull		Any Bull	Any Bull	Any Bull
1992	Any Bull	Any Bull		Any Bull	Any Bull	Any Bull
1993	Any Bull	Any Bull		Any Bull	Any Bull	Any Bull
1994	Any Bull	3 Pt Minimum		Any Bull	Any Bull	Any Bull
1995	Any Bull	3 Pt Minimum		Any Bull	Any Bull	Any Bull
1996	Any Bull	3 Pt Minimum		Any Bull	Any Bull	Any Bull
1997	Spike Only		3 Pt Minimum		Spike Only	Spike Only
1998	3 Pt Minimum		3 Pt Minimum		3 Pt Minimum	3 Pt Minimum
1999	3 Pt Minimum		3 Pt Minimum		3 Pt Minimum	3 Pt Minimum
2000	3 Pt Minimum		3 Pt Minimum		3 Pt Minimum	3 Pt Minimum

Currently, the entire South Rainier herd is under a three-point minimum state regulated harvest regime. This puts harvest pressure on the older age classes of the population (2.5 years old or more). Antler point restrictions will typically result in higher post-season bull:cow ratios, at the expense of bull survivorship into older age classes. Prior to 2000, antlerless harvest was allowed during archery seasons, and during firearm seasons by special permit. For the 2000-02 hunting seasons, no regulated antlerless harvest during general hunting seasons are provided, except for early archery seasons in the Skookumchuck Unit. Antlerless hunting is now allowed only during special damage hunts, and only within the boundaries of the damage area.

Damage

The problem of elk damage and the most effective method to alleviate it is one of the most important issues of elk management, in Washington. Possible solutions to chronic elk damage include hazing, fencing, trapping and transplanting the offending animals or lethally removing them.

In western Washington, hazing or harassing elk with cracker shells and other noisy devices has not been effective because elk quickly get conditioned to the disturbance. Elk-proof fencing has been used to protect highly valuable crops and orchards in eastern Washington, but it has not been used extensively on the west side because of high construction and maintenance costs. Due to financial and logistic concerns, trapping and transplanting damage-causing elk has not been a practical solution either.

Lethal removal has proven to be the most effective tool. Currently, the Department is assessing the efficacy of specific damage area hunts versus landowner kill permits. It is of utmost importance that the methods used specifically target and reduce only damage-causing elk as opposed to total eradication. In some parts of their range elk are declining where they are wanted and increasing where they are not wanted. The South Rainier herd provides such an example.

Further complicating the damage issue are the varying public perceptions concerning the role and place of elk in the ecosystem. Farmers, Christmas tree growers, and residential homeowners all have differing attitudes towards elk. In parts of Packwood, for instance, lawns are purposefully maintained to attract elk, whereas a mile away, elk are considered a nuisance and are actively being harassed or removed using a landowner kill permit.

Unfortunately, elk damage to commercial agricultural crops, plant nurseries, pastures, residential landscapes and tree farms in the South Rainier herd area is becoming more widespread. Damage occurs on farms and ranches occupying the Cowlitz and Skookumchuck river lowlands and the Hanaford Creek bottomlands—all traditional wintering areas for the South Rainier herd. Horticultural damage also occurs in developed areas near Packwood and Randle, the principal towns in the eastern half of the herd's range. Although the number of claims that are financially compensated is slight, (Table 5) the volume of complaints continues to increase. To address damage caused by wildlife, a timely process for resolving any claims is provided through the Revised Code of Washington, found in code 77.36.005 - 080 (Appendix B).

Table 5. Summary of Elk Damage Complaints Associated With South Rainier Elk Herd.

Year	Total Complaints	Monetary Compensation
1995	10	\$1,470.00
1996	22	\$1,235.00
1997	16	\$0.00
1998	13	\$0.00
1999	29	\$0.00

Several damage-control hunts are annually held in the South Rainier herd area. One, conducted in January, is designed to target specific groups of elk that cause damage along the Cowlitz and Cispus rivers near Randle. Another damage control hunt, on or adjacent to the Centralia Mine, provides disabled hunters an opportunity to take antlerless elk. Damage complaints have also been addressed in these areas by issuing landowner kill permits. These permits have provided some compensation to landowners, but have not effectively reduced damage and use by the offending elk. It is hoped that the more widespread harassment and harvest of cow elk during special damage hunts will ultimately result in fewer damage complaints.

Tribal Hunting

Four Native American tribes retain treaty rights to hunt within the South Rainer herd's range—the Muckleshoot, Nisqually, Puyallup and Squaxin Island. Together they make up the Medicine Creek Treaty Tribes. Coordinating management objectives between the state and these tribes regarding elk population levels, habitat and harvest will be in the best interest of future elk recovery and management.

Non-consumptive Uses

Public viewing of the South Rainier herd is popular, particularly summer viewing in the high country of Mt. Rainier National Park, the adjacent Tatoosh Wilderness Area, and the Goat Rocks Wilderness Area. The economic benefit derived through appreciative uses is difficult to document, but is likely to be very significant.

Expanding human use of elk habitat can create conflict with the elk resource. Disturbance to elk during calving seasons can have an impact on calf survival (Phillips and Alldredge 2000) and disturbances caused by vehicular traffic on roads reduces usable habitat (Cole et al. 1999). The collective impact of human disturbance has not been definitively studied, however, it is believed to negatively impact elk populations and the quality and quantity of usable habitat.

HABITAT MANAGEMENT

At this time, we believe that the South Rainier elk herd's population is being limited more strongly by direct mortality from both legal and illegal hunting than by the quantity or quality of the existing habitat. As mentioned earlier in this plan, the only possible exception to this is elk in GMU 510 (Stormking), where elk may be limited by topography. Habitat condition and quantity may become limiting factors for this herd in the future for a number of reasons.

Limitations and Losses

The South Rainier herd faces continual losses of summer and winter habitat on U.S. Forest Service lands as they are modified to create extensive mature to old growth forests called Late Successional Reserve areas (Washington Department of Fish and Wildlife 1998). Loss of elk habitat from establishing these reserves is expected to decrease the land's ability to support elk by up to 40 percent in certain areas (R. Scharpf, GPNF, unpubl. data). Efforts to minimize this impact, including manipulating these mature forest stands to provide elk forage, are currently being evaluated by the Gifford Pinchot National Forest and the Washington Department of Fish

and Wildlife. Additionally, the Gifford Pinchot's Randle and Packwood Ranger Districts are demonstration areas for new silvicultural practices aimed at producing timber while minimizing the impacts on wildlife species dependent on mature forests. These demonstration projects may also help identify methods that minimize the loss of elk habitat.

Another threat to critical elk habitat in the South Rainier herd area is forest encroachment on high elevation meadows. An analysis conducted by the U.S. Forest Service and the Department from 1959 to 1990 indicated that approximately 20 percent of high elevation meadows in the southern part of the range has been taken over by conifer trees (Washington Department Fish and Wildlife 1998). In addition, 79 percent of the remaining meadows showed moderate to high levels of tree intrusion. Presently, the Department and the Forest Service are looking at methods to reduce or inhibit conifers from encroaching on critical summer elk habitat.

Mining operations in the western half of the herd's range also eliminates elk habitat, sometimes forcing the animals to move to adjacent private pasturelands to find food. Landowner intolerance for elk damaging hay crops and fences makes these pastures unsuitable winter range. Damage hunts and landowner kill permits remain necessary tools to reduce elk numbers and drive them from these attractive feeding areas.

Enhancement and Improvement Projects/Ideas

Several projects have been initiated to increase elk habitat carrying capacity east of State Highway 7. A grass, forbs seeding program was implemented from 1989 through 1994 on 368 acres of U.S. Forest Service land within the South Rainier herd's range. An additional 60 acres of wintering habitat was planted with preferred forage in GMU 516 (Packwood), (Table 6). A lack of intensive site preparation limited the ultimate success of the forage-seeding program.

Table 6. Habitat Enhancement Projects Conducted for South Rainier Elk Herd, East of SR 7.

Year	Project	Acres	Location
1989	Forage Seeding and Fertilization	102	GMUs 513 and 516
1989	Browse Planting	30	GMU 516
1990	Forage Seeding and Fertilization	173	GMUs 513 and 516
1991	Browse Planting	30	GMU 516
1992	Forage Seeding and Fertilization	81	GMUs 513 and 516
1993	Forage Seeding and Fertilization	12	GMU 513

Browse plantings have been somewhat more successful, however, they are also more expensive and labor intensive to implement. Mitigation lands in the Skookumchuck River floodplain, managed by PacifiCorp in cooperation with the Washington Department of Fish and Wildlife, grow forage specifically for elk. Likewise, part of Centralia Mine's reclamation protocol calls for reseeding and fertilizing mined lands with certain grasses and forbs to increase the elk's food supply.

The annual winter closure (December through April) of approximately 45 miles of forest service roads has helped reduce human harassment of wintering elk. Closures of entire drainages within the herd's winter range would greatly reduce poaching and other human-related mortality. Road closures and the subsequent restriction of human access have been shown to result in lower stress and higher survival for elk (Cole et al. 1999). Currently, public sentiment is strongly against any further access restrictions, so additional opportunities to close roads are likely limited.

South Rainier elk winter primarily along the Cowlitz River, from Packwood to Randle. This winter habitat is shared with elk from the St. Helens herd, and much is already in agricultural or residential development (including the towns of Packwood and Randle). Residential development along the Cowlitz River continues to reduce key winter habitat, as well as increase the potential for human/elk conflicts. Acquiring and then closing key winter range to human access is one possible way to reduce damage in the valley, and at the same time reduce poaching. However, conservation easements and other incentive programs that encourage landowners to protect and enhance elk habitats are also sorely needed.

The Washington Department of Fish and Wildlife's review of timber harvest plans in the herd's winter range, in coordination with the Gifford Pinchot National Forest and the Washington Department of Natural Resources, has also facilitated maintaining the quality of elk winter habitat within the remaining forested tracts along the Cowlitz River.

The Washington Department of Fish and Wildlife will continue to develop elk habitat improvement projects through partnerships with the Gifford Pinchot National Forest, the Washington Department of Natural Resources, the Rocky Mountain Elk Foundation, and other organizations and landowners. Elk foundation volunteers are a readily available and willing source of manpower to accomplish habitat improvement projects.

RESEARCH NEEDS

More information is needed on the movements and wintering areas of the South Rainier elk herd. The movement patterns of the national park elk have been described (Bradley 1982), but those of the elk living outside the park are poorly understood. This information is needed to identify specific elk winter areas, and to assess the potential impacts of increased development along the upper Cowlitz River and modified forest practices in the Gifford Pinchot National Forest. Complicating this issue, a portion of the St. Helens elk herd also winters along the Cowlitz River in the Randle-Packwood area.

In the winter of 1999-2000, a joint research effort was started between the Medicine Creek Treaty Tribes and the Washington Department of Fish and Wildlife to clarify the movements and summer origin of elk that winter in the Cowlitz River Valley. This project is slated to continue; hopefully the data gathered will help further our understanding of the movements and population dynamics of the South Rainier elk herd.

HERD MANAGEMENT GOALS

The goals of the South Rainier Elk Herd Plan are:

1. Manage the South Rainier Elk Herd for a sustained yield.
2. 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. Preserve, protect, perpetuate, manage and enhance elk and their habitats to ensure healthy, productive populations.

MANAGEMENT OBJECTIVES, PROBLEMS AND STRATEGIES

Herd Management

Objective #1

Manage the South Rainier Elk Herd using the best available science.

Problem: Inadequate survey intensity limits our ability to collect adequate samples of elk herd age and sex composition data.

Strategies

1. Monitor annual production and recruitment levels using pre-hunting season composition surveys. Increase level of pre-hunting season composition surveys by 100 percent to more precisely (90 percent C.I. of ≤ 10 percent of the mean) document herd demographics and population size.
2. Utilize post-hunting season (spring) surveys to better estimate ultimate recruitment rates.

Problems: Accurate and timely harvest data is a critical element for making management recommendations and correcting problems. 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 provided in sufficient detail to accurately formulate management recommendations.

Strategies

1. Increase precision and accuracy of recreational harvest from state hunters using mandatory reporting.
2. Increase precision and accuracy of tribal harvest.
3. Standardize data collection methods.

Problem: There is a general lack of data for the South Rainier herd on elk movements and elk mortality rates from poaching, road kills, and predation to make sound management decisions.

Strategies

1. Increase the precision of bull elk mortality rates and elk population estimates by increasing the intensity and total survey area.
2. Continue the joint research project with the Medicine Creek Treaty Tribes to determine movement patterns, herd composition, and mortality rates of elk using radio telemetry.

Objective # 2

Increase the estimated elk population in the Cascade sub-herd from present levels of about 1,700 elk to about 2,500 elk, in keeping with habitat limitations and landowner tolerance.

Problem: The estimated elk population in the Cascade sub-herd has declined approximately 39 percent since 1994.

Strategies

1. Increase elk in areas where they cause little conflict and decrease elk in areas where they cause problems.
 - a. Strive to acquire key winter habitat.
 - b. Determine efficacy and overall success of the damage hunt program.
2. Eliminate antlerless hunting if population goals are not being met.
3. If recruitment levels are inconsistent with population objectives, adjust strategies for harvest management and investigate the cause

Objective #3

Manage all elk units for bull ratios consistent with the Statewide Elk Plan (currently greater than or equal to 12 bulls per 100 cows post-season) in combination with overall bull mortality rates lesser than or equal to 50 percent.

Problem: Current ratios are below objective.

Strategies

1. Maintain current management strategies for GMUs through the 2002 season to determine whether they achieve objectives for bull:cow ratios and bull mortality rates.
2. Where bull escapement fails to meet objectives, explore other options to meet management strategies such as reducing season length or initiating permit-only hunting.

Objective #4

Minimize damage caused by elk.

Problem: There are an increasing number of elk/human conflicts throughout the winter habitat of the South Rainier herd, caused in part by residential encroachment on that habitat.

Strategies

1. Use hot spot hunts, landowner damage hunts, and landowner kill permits that target the elk doing the damage. In areas of widespread historic damage, special late-season hunts will be used to suppress local populations of elk.
2. Increase forage enhancement projects on U.S. Forest Service, Washington Department of Natural Resources, PacifiCorp, and industrial forest lands.
3. Investigate and identify what factors predispose areas to damage, such as elk numbers, elk behavior, and human influences.
4. Work with individuals or groups of landowners to develop incentive programs or conservation easements that reward them for maintaining or enhancing elk populations and for creating and allowing elk recreational use opportunities on their lands.

Objective #5

Increase public awareness of the elk resource and promote non-consumptive values of elk, including viewing and photographic opportunities.

Problem: The full potential for elk-viewing opportunities that provide educational and recreational experiences is not being met.

Strategy

1. Develop a brochure for the public with general information on where elk are likely to be found, their natural history and management and how to view or photograph elk without harassing them.

Habitat Management

Objective #1

Encourage the U.S. Forest Service to maintain the current amount and quality of elk habitat on their lands (no net loss).

Problems: Reduction in timber harvest volume, and conifer encroachment of high elevation meadows are significant elk habitat problems.

Strategies

1. Work with the U.S. Forest Service to develop silvicultural treatments to increase elk habitat quality in mature forest stands (Late Successional Reserves).
2. Identify suitable mixed-aged forestlands and other younger forest habitat to be managed preferentially for elk.
3. Continue to reduce road densities to one mi/mi² on winter habitat.
4. Continue to work with the U.S. Forest Service to identify and maintain high elevation meadows.

Objective #2

Maintain the current level of winter range along the Cowlitz and Skookumchuck rivers and the Hanaford Valley.

Problem: Increasing urban development has resulted in significant loss of elk winter habitat, especially along the upper Cowlitz River Valley bottomlands.

Strategies

1. Work with both public and private landowners to design development strategies that do not reduce winter range for elk.
2. Continue to work with the U.S. Forest Service, The Washington Department of Natural Resources and PacifiCorp to manage for no net loss of winter range capability due to forest practices and mining.
3. Acquire management authority for critical elk winter habitat through conservation easements, lease agreements, land exchanges, landowner incentives, and fee purchases.
4. Continue to reduce open road densities to one mi/mi² on wintering areas.

Objective #3

Maintain the quality of elk summer range, no matter the land ownership.

Problem: Changing land-use patterns are resulting in the loss of early successional forest habitats, important for elk survival.

Strategies

1. Increase cooperative forage enhancement efforts with public and private landowners.
2. Identify and protect key habitats, such as winter and calving areas.

Objective #4

Develop partnerships to improve habitat for elk.

Problem: There is a lack of broad public support for elk habitat improvements.

Strategies

1. Seek funding and support from conservation organizations.
2. Work closely with agencies and industrial timber landowners.
3. Solicit volunteers to conduct projects.

SPENDING PRIORITIES

The following priority investments are needed to implement the South Rainier Elk Herd Plan.

Priority # 1

Pre-hunting season composition surveys

Annual pre-season composition surveys are the single most important activity that the Washington Department of Fish and Wildlife conducts to monitor elk population status. Survey funding levels need to be substantially increased so this herd can be managed utilizing the best science. Pre-hunting season composition surveys supply the best data to estimate bull elk mortality rates and the level of antlerless harvest that the herd can sustain. These rates must be more precisely determined to assess the success of various bull elk harvest strategies, increase the precision of population estimates, and document the effect of recreational and tribal harvest.

Priority: High—basic biological data collection is essential for continued proper management of the South Rainier elk herd

Time line: Ongoing for the next 5 years

Cost: \$6000/year

Priority # 2

Improve state and tribal harvest data collection

Increase the precision and accuracy of estimating tribal and state harvest of the South Rainier herd by increasing the hunt-reporting rate.

Priority: High—the accurate and timely collection of harvest data is important to continue responsible management of the South Rainier elk herd.

Time line: Ongoing for the next 5 years.

Cost: \$12,000/year

Priority # 3

Secure and enhance more winter habitat

Work in conjunction with the U.S. Forest Service, the Washington Department of Natural Resources, the Rocky Mountain Elk Foundation and private landowners to secure and then enhance large tracts of winter range through seeding and fertilization as well as

access limitations. This is critical to reduce damage complaints and to compensate for the continued loss of winter habitat to human development. Protecting and enhancing elk winter ranges along the upper Cowlitz River bottomlands are crucial to maintaining and enhancing elk populations.

Priority: High—critical to reduce damage complaints and maintain and enhance elk populations in that area

Time line: Ongoing for the next 5 years.

Cost: \$50,000/year, \$250,000 over five years

Priority # 4

Post-hunting season composition surveys

Spring composition surveys of the South Rainier herd should be substantially increased as funds allow to determine elk over winter survival.

Priority: Moderate—first priority is with pre-hunting season composition surveys.

Time line: Ongoing for the next five years.

Cost: \$3,000/year

Priority # 5

Increase enforcement emphasis

Increase the level of law enforcement (emphasis patrols) and initiate a program to better involve citizens in anti-poaching campaigns. Poaching is likely a driving factor in the population decline of this herd. Present enforcement presence is inadequate to address this problem.

Priority: Moderate

Time line: For five years.

Cost: \$10,000/year

Plan Review and Maintenance

The South Rainier Elk Herd Plan is a five-year document subject to annual review and amendment. As new information is gathered and conditions change it will be necessary to track strategies and their impact on the plan's goals and objectives in order to re-evaluate and modify this plan as needed. A free exchange of information and open communication between the Washington Department of Fish and Wildlife, Tribes, and cooperators will be key to this plan's success. An annual review meeting with delegates from the Medicine Creek Treaty Tribes will be arranged through the Northwest Indian Fisheries Commission and the Department's Region 5 Wildlife Program Manager. Emergent issues can be addressed, as needed either at the technical or policy level.

Literature Cited

- Bender, L. C. and R. D. Spencer. 1999. Estimating elk population size by reconstruction from harvest data and herd ratios. *Wildlife Society Bulletin* 27:636-645.
- Bradley, W. P. 1982. History, ecology, and management of an introduced wapiti population in Mount Rainier National Park, Washington. Ph.D. Thesis, University of Washington, Seattle. 274 pp.
- Cole, E. K., M. D. Pope, and R. G. Anthony. 1999. Effects of road management on movement and survival of Roosevelt elk. *Journal of Wildlife Management*. 61:1115-1126.
- Franklin, J. F. and C. T. Dyrness. 1973. Natural vegetation of Oregon and Washington. USDA Forest Service General Technical Report PNW-8. 417 pp.
- Pautzke, C., B. Lauckhart, and L. Springer. 1939. Washington elk report, 1939. Unpub. Report. Washington Department of Game, Olympia. 22 pp.
- Phillips, Gregory E. and A. W. Alldredge. 2000. Reproductive success of elk following disturbance by humans during calving season. *Journal of Wildlife Management* 64:521-530.
- Schullery, P. 1984. A history of native elk in Mount Rainier National Park. Final report to National Park Service, Mount Rainier National Park. 110 pp.
- Smith, J. L., W. A. Michaelis, K. Sloan, J. Musser, and J. D. Pierce. 1994. An analysis of elk poaching losses and other mortality sources in Washington using biotelemetry. Washington Department of Fish and Wildlife. 79pp
- Thomas, J. W., and D. E. Toweill. 1982. Elk of North America, Ecology and Management. The Wildlife Management Institute. 698 pp.
- U.S. Department of Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census. 1997. 1996 National survey of fishing, hunting, and wildlife-associated recreation. 115pp
- Walkinshaw, Eric. 1999. 1967-1998 Visitor Use. Mount Rainier National Park Official Home Page <<http://www.nps.gov/mora/home.htm>>.
- Washington Department of Fish and Wildlife. 1998. 1998 Game status and trend report. Wildlife Management Program, Washington Department of Fish and Wildlife. Olympia. 224 pp.

- 1997. Washington state management plan for elk. Wildlife Management Program, Washington Department of Fish and Wildlife. Olympia. 27pp.

- 1996. Final environmental impact statement for the Washington state management plan for elk. Wildlife Management Program. Washington Department of Fish and Wildlife. Olympia. 217pp.

APPENDIX A. Elk Hunting Seasons for the South Rainier Herd

Year	GMU # & (Number of Permits)	Dates	Days	Legal Animal	Hunting Description and Tag Type
2001	510, 513, 516 667	9/1 – 9/14 9/1 – 9/14	14 14	3Pt minimum 3Pt. min. or antlerless	Early Archery General (WA)
	513	10/6 – 10/12	7	3Pt. minimum	Early Muzzleloader Only (WM)
	510, 513, 516, 667	11/3 – 11/11	9	3Pt. minimum	Modern Firearm General (WF)
	667 Centralia Mine A (4) 667 Centralia Mine B (4) 667 Skookumchuck A (4) 667 Skookumchuck B (4)	10/27 – 10/28 11/3 – 11/4 11/17 – 11/25 12/6 – 12/16	2 2 9 11	Antlerless only Antlerless only Antlerless only Antlerless only	Persons of Disability Permit Only Hunt (any elk tag)
2000	510, 513, 516 667	9/1 – 9/14 9/1 – 9/14	14 14	3Pt minimum 3Pt. min. or antlerless	Early Archery General (WA)
	513	10/7 – 10/13	7	3Pt. minimum	Early Muzzleloader Only (WM)
	510, 513, 516, 667	11/4 – 11/12	9	3Pt. minimum	Modern Firearm General (WF)
	667 Centralia Mine A (4) 667 Centralia Mine B (4)	10/28 – 10/29 11/4 – 11/5	2 2	Antlerless only Antlerless only	Persons of Disability Permit Only Hunt (any elk tag)
1999	510, 513, 516, 667	9/1 – 9/14	14	3Pt. min. or antlerless	Early Archery General (WA)
	513	10/9 – 10/15	7	3Pt. minimum	Early Muzzleloader Only (WM)
	510, 513, 516, 667	11/6 – 11/14	9	3Pt. minimum	Modern Firearm General (WF)
	516 (25)	11/10 – 11/14	5	Antlerless only	Modern Firearm Permit Only Hunt. (WF, WM)
	667 (2)	10/1 – 10/10	10	3Pt. minimum or antlerless	AHE Permit Only Hunt (any elk tag)
	667 Centralia Mine A (4) 667 Centralia Mine B (4) 667 Centralia Mine C (8) 667 Centralia Mine D (8)	10/31 – 11/1 11/7 – 11/8 1/8 – 1/16 1/22 – 1/30	2 2 9 9	Antlerless only Antlerless only Antlerless only Antlerless only	Persons of Disability Permit Only Hunt (any elk tag)
1998	510, 513, 516, 667	9/1 – 9/14	14	3Pt. min. or antlerless	Early Archery General (WA)
	513	10/10 – 10/16	7	3Pt. minimum	Early Muzzleloader Only (WM)
	510, 513, 516, 667	11/7 – 11/15	9	3Pt. minimum	Modern Firearm General (WF)
	516 (25)	11/11 – 11/15	5	Antlerless only	Modern Firearm Permit Only hunt. (WG,WM)
	667 (2)	10/1 – 10/10	10	3Pt. minimum or antlerless	AHE Permit Only Hunt (any elk tag)
	667 Centralia Mine A (4) 667 Centralia Mine B (4)	10/31 – 11/1 11/7 – 11/8	2 2	Antlerless only	Persons of Disability Permit Only Hunt (any elk tag)
1997	516 510, 667 513	9/1 – 9/14 9/1 – 9/14 9/1 – 9/14	14 14 14	Either-sex Spike or antlerless 3Pt. min. or antlerless	Early Archery General (WA)
	513	10/4 – 10/10	7	3Pt. minimum	Early Muzzleloader Only (WM)
	510, 513, 516, 667	11/8 – 11/16 11/10 – 11/16	9 7	Spike bull only	Modern Firearm General (WG) Modern Firearm General (WP)

Year	GMU # & (Number of Permits)	Dates	Days	Legal Animal	Hunting Description and Tag Type
	516 (25)	11/12 – 11/16	5	Antlerless only	Modern Firearm Permit Only Hunt (WP or WM)
	667 (2)	10/1 – 10/10	10	3Pt. minimum or antlerless	AHE Permit Only Hunt (any elk tag)
	667 Centralia Mine A (4) 667 Centralia Mine B (4)	11/22 – 11/23 11/29 – 11/30	2 2	Antlerless only Any elk	Persons of Disability Permit Only Hunt (any elk tag)
1996	510, 514, 516, 667 512	9/1 – 9/14 9/1 – 9/14	14 14	Either-sex 3Pt. min. or antlerless	Early Archery General (WA)
	510, 512*, 514, 516, 667	11/6 – 11/17 11/9 – 11/17	12 9	Bulls with visible antlers (* except 3 Pt. min. in GMU 512)	Modern Firearm General (WG) Modern Firearm General (WP)
	516 (50)	11/18 – 11/24	7	Antlerless only	Modern Firearm Permit Only Hunt (WP or WM)
	667 Centralia Mine A (4) 667 Centralia Mine B (4)	11/16 – 11/17 11/30 – 12/1	2 2	Antlerless only Either-sex	Persons of Disability Permit Only Hunt (any elk tag)
1995	510, 514, 516, 667 512	9/1 – 9/14 9/1 – 9/14	14 14	Either-sex 3Pt. Min. or antlerless	Early Archery General (WA)
	510, 512*, 514, 667	11/1 – 11/13 11/4 – 11/13	13 10	Bulls with visible antlers (* except 3 Pt. min. in GMU 512)	Modern Firearm General (WG) Modern Firearm General (WP)
	667 (5)	10/7 – 10/12	6	Either-sex	AHE Special Permit Only Hunt (any elk tag)
	667 Centralia Mine A (6) 667 Centralia Mine B (7) 667 Centralia Mine C (7)	11/18 – 11/19 11/25 – 11/26 12/2 – 12/3	2 2 2	Antlerless only Antlerless only Either-sex	Persons of Disability Permit Only Hunt (any elk tag)
1994	510, 514	9/1 – 9/14	14	Either-sex	Early Archery General (WA)
	512	9/1 – 9/14	14	3 Pt. Min. or antlerless	Early Archery General (WA)
	510, 512*, 514, 516, 667	11/2 – 11/13 11/5 – 11/13	12 9	Bulls with visible antlers (* except 3 Pt. min. in GMU 512)	Modern Firearm General (WE) Modern Firearm General (WL)
	516 (50)	11/14 – 11/19	6	Antlerless only	Modern Firearm Permit Only Hunt (WC or WM)
	667 (5)	10/8 – 10/13	6	Either-sex	AHE Special Permit Only Hunt (any elk tag)
	667 Centralia Mine A (6) 667 Centralia Mine B (7) 667 Centralia Mine C (7)	11/19 – 11/20 11/26 – 11/27 12/3 – 12/4	2 2 2	Antlerless only Antlerless only Either-sex	Persons of Disability Permit Only Hunt (any elk tag)
1993	510, 514, 512, 516, 667	9/1 – 9/14	14	Either-sex	Early Archery General (WA)
	510, 512, 514, 516, 667	11/3 – 11/14 11/6 – 11/14	12 9	Bulls with visible antler	Modern Firearm General (WE) Modern Firearm General (WL)
	516 (75)	11/16 – 11/21	6	Antlerless only	Modern Firearm Permit Only Hunt (WL or WM)
	667 Centralia Mine A (11) 667 Centralia Mine B (11) 667 Centralia Mine C (8)	11/20 – 11/21 11/27 – 11/28 12/4 – 12/5	2 2 2	Antlerless only Antlerless only Either-sex	Persons of Disability Permit Only Hunt (WL or WM)
1992	510, 514, 512, 516, 667	10/1 – 10/14	14	Either-sex	Early Archery General (WA)
	510, 512, 514, 516, 667	11/4 – 11/15 11/7 – 11/15	12 9	Bulls with visible antlers Bulls with visible antlers	Modern Firearm General (WE) Modern Firearm General (WL)

Year	GMU # & (Number of Permits)	Dates	Days	Legal Animal	Hunting Description and Tag Type
	516 (75)	11/17 – 11/22	6	Antlerless only	Modern Firearm Permit Only Hunt (WL or WM)
1991	510, 514, 512, 516, 667	9/28 – 10/11	14	Either-sex	Early Archery General (WA)
	510, 512, 514, 516, 667	11/6 – 11/17 11/9 – 11/17	12 9	Bulls with visible antlers Bulls with visible antlers	Modern Firearm General (WE) Modern Firearm General (WL)
	516 (50)	10/19 – 10/24	6	Antlerless only	Modern Firearm Permit Only Hunt (WL or WM)
1990	510, 514, 512, 516, 667	9/29 – 10/12	14	Either-sex	Early Archery General (WA)
	510, 512, 514, 516, 667	10/31 – 11/11 11/3 – 11/11	12 9	Bulls with visible antlers Bulls with visible antlers	Modern Firearm General (WE) Modern Firearm General (WL)
	516 (50)	10/13 – 10/18	6	Antlerless only	Modern Firearm Permit Only Hunt (WL or WM)
1989	510, 667	9/30 – 10/13	14	Either-sex	Early Archery General (WA)
	510, 512, 514, 516, 667	11/1 – 11/12 11/4 – 11/12	12 9	Bulls with visible antlers Bulls with visible antlers	Modern Firearm General (WE) Modern Firearm General (WL)
	516 (50)	10/14 – 10/19	6	Antlerless only	Modern Firearm Permit Only Hunt (WL or WM)
1988	508, 510, 512, 514, 516, 667	10/1 – 10/14	14	Either-sex	Early Archery General (WA)
	508, 510, 512, 514, 667	11/2 – 11/13 11/5 – 11/13	12 9	Bulls with visible antlers Bulls with visible antlers	Modern Firearm General (WE) Modern Firearm General (WL)
	516 (50)	11/16 – 11/20	5	Antlerless only	Modern Firearm Permit Only Hunt (WL or WM)
1987	508, 510, 512, 514, 516, 668	10/1 – 10/16	16	Either-sex	Early Archery General (WA)
	508, 510, 512, 514, 516, 668	11/4 – 11/15 11/7 – 11/15	12 9	Bulls with visible antlers Bulls with visible antlers	Modern Firearm General (WE) Modern Firearm General (WL)
	516 (50)	11/16 – 11/21	6	Antlerless only	Modern Firearm Permit Only Hunt (WL or WM)
1986	508, 510, 512, 514, 516, 668	9/3 – 9/7 9/8 – 9/17	5 10	Bull only Either-sex	Early Archery General (WA)
	508, 510, 512, 514, 668	11/5 – 11/16 11/8 – 11/16	12 9	Bulls with visible antlers Bulls with visible antlers	Modern Firearm General (WE) Modern Firearm General (WL)
1985	508, 510, 512, 514, 668	9/4 – 9/8 9/9 – 9/18	5 10	Bull only Either-sex	Early Archery General (WA)
	508, 510, 512, 514, 516, 668	11/6 – 11/17 11/9 – 11/17	12 9	Bulls with visible antlers Bulls with visible antlers	Modern Firearm General (WE) Modern Firearm General (WL)
	516 (50)	11/30 – 12/5	6	Antlerless only	Modern Firearm Permit Only Hunt (WL or WM)
1984	508, 510, 512, 514, 516, 668	9/5 – 9/9 9/10 – 9/19	5 10	Bull only Either-sex	Early Archery General (WA)
	508, 510, 512, 514, 516, 668	11/7 – 11/18 11/10 – 11/18	12 9	Bulls with visible antlers Bulls with visible antlers	Modern Firearm General (WE) Modern Firearm General (WL)
	516 (50)	12/1 – 12/5	5	Antlerless only	Modern Firearm Permit Only Hunt (WL or WM)
1983	508, 510, 512, 514, 668	9/5 – 9/9 9/10 – 9/19	5 10	Bull only Either-sex	Early Archery General (WA)
	508, 510, 512, 514, 516, 668	11/5 – 11/15	11	Bulls with visible antlers	Modern Firearm General (W)

Year	GMU # & (Number of Permits)	Dates	Days	Legal Animal	Hunting Description and Tag Type
	516 (50)	11/26 – 11/30	5	Antlerless only	Modern Firearm Permit Only Hunt (W)
1982	508, 510, 512, 514, 516, 668	11/06 – 11/16	11	Bulls with visible antlers	Modern Firearm General (W)
	516 (75)	11/27 – 12/1	5	Antlerless only	Modern Firearm Permit Only Hunt (MKWY)
1981	508, 512, 514, 516, 666	11/7 – 11/17	11	Bulls with visible antlers	Modern Firearm General (W)
	516 Packwood (75)	11/28 – 12/2	5	Antlerless only	Permit Controlled Elk Hunt (MKWY)
1980	508, 512, 514, and parts of 504, 516, 666	11/9 – 11/19	11	Bulls with visible antlers	Modern Firearm General (W)
	514 Tatoosh (25) 516 Packwood (75)	11/20 – 11/24	5	Antlerless only	Special Permit Controlled Hunt (W)
1979	508, 512, 514 and parts of 504, 516, 666	11/11 – 11/25	15	Bulls with visible antlers	Modern Firearm General (W)
	514 Tatoosh (25) 516 Packwood (75)	11/14 – 11/25	12	Either-sex	Special Permit Controlled Hunt (W)
1978	508, 512, 514 and parts of 504, 516, 666	11/6 – 11/19	14	Bulls with visible antlers	Modern Firearm General
	514 Tatoosh (25) 516 Packwood (75)	11/11 – 11/19	9	Either-sex	Special Permit Controlled Hunt
1977	508, 512, 514 and parts of 504, 516, 666	10/31 – 11/13	14	Bulls with visible antlers	Modern Firearm General
	514 Tatoosh (25) 516 Packwood (75)	11/5 – 11/13	9	Either-sex	Special Permit Controlled Hunt
1976	508, 512, and parts of 504, 516, 666	11/1 – 11/14	14	Bulls with visible antlers	Modern Firearm General
	516 Packwood (100)	11/6 – 11/14	9	Either-sex	Special Permit Controlled Hunt
1975	508, 512, and parts of 504, 516, 666	11/3 – 11/16	14	Bulls with visible antlers	Modern Firearm General
	516 Packwood (100)	11/8 – 11/16	9	Either-sex	Special Permit Controlled Hunt
1974	8K, 8M, and parts of 8C, 8B, 8P	11/4 – 11/17	14	Bulls with visible antlers	Modern Firearm General
	8P Lewis-Skamania (100)	11/9 – 11/17	9	Either-sex	Special Permit Controlled Hunt
1973	8K, 8M, and parts of 8C, 8B, 8P	11/5 – 11/18	14	Bulls with visible antlers	Modern Firearm General
	8P Lewis-Skamania (150)	11/10 – 11/18	9	Either-sex	Special Permit Controlled Hunt
1972	8K, 8M, and parts of 8C, 8B, 8P	10/30 – 11/12	14	Bulls with visible antlers	Modern Firearm General
	8P Lewis-Skamania (125)	11/4 – 11/12	9	Either-sex	Special Permit Controlled Hunt
1971	8K, 8M, and parts of 8C, 8B, 8P	11/1 – 11/14	14	Bulls with visible antlers	Modern Firearm General
	8P Lewis-Skamania (75)	11/6 – 11/9	4	Either-sex	Special Permit Controlled Hunt
1970	8K, 8M, and parts of 8C, 8B, 8P	11/7 – 11/22	16	Bulls with visible antlers	Modern Firearm General

APPENDIX B. Management Authority for Controlling Elk Damage (RCW, Title 77)

RCW 77.36.005

Findings.

The legislature finds that:

(1) As the number of people in the state grows and wildlife habitat is altered, people will encounter wildlife more frequently. As a result, conflicts between humans and wildlife will also increase. Wildlife is a public resource of significant value to the people of the state and the responsibility to minimize and resolve these conflicts is shared by all citizens of the state.

(2) In particular, the state recognizes the importance of commercial agricultural and horticultural crop production, rangeland suitable for grazing or browsing of domestic livestock, and the value of healthy deer and elk populations, which can damage such crops. The legislature further finds that damage prevention is key to maintaining healthy deer and elk populations, wildlife-related recreational opportunities, commercially productive agricultural and horticultural crops, and rangeland suitable for grazing or browsing of domestic livestock, and that the state, participants in wildlife recreation, and private landowners and tenants share the responsibility for damage prevention. Toward this end, the legislature encourages landowners and tenants to contribute through their land management practices to healthy wildlife populations and to provide access for related recreation. It is in the best interests of the state for the department of fish and wildlife to respond quickly to wildlife damage complaints and to work with these landowners and tenants to minimize and/or prevent damages and conflicts while maintaining deer and elk populations for enjoyment by all citizens of the state.

(3) A timely and simplified process for resolving claims for damages caused by deer and elk for commercial agricultural or horticultural products, and rangeland used for grazing or browsing of domestic livestock is beneficial to the claimant and the state.

[1996 c 54 ' 1.]

RCW 77.36.010

Definitions.

The definitions in this section apply throughout this chapter unless the context clearly requires otherwise.

(1) "Crop" means (a) a growing or harvested horticultural and/or agricultural product for commercial purposes; or (b) rangeland forage on privately owned land used for grazing or browsing of domestic livestock for at least a portion of the year for commercial purposes. For the purposes of this chapter all parts of horticultural trees shall be considered a crop and shall be eligible for claims.

(2) "Emergency" means an unforeseen circumstance beyond the control of the landowner or tenant that presents a real and immediate threat to crops, domestic animals, or fowl.

(3) "Immediate family member" means spouse, brother, sister, grandparent, parent, child, or grandchild.

[1996 c 54 ' 2.]

RCW 77.36.020

Game damage control -- Special hunt.

The department shall work closely with landowners and tenants suffering game damage problems to control damage without killing the animals when practical, to increase the harvest of damage-causing animals in hunting seasons, and to kill the animals when no other practical means of damage control is feasible.

If the department receives recurring complaints regarding property being damaged as described in this section or RCW 77.36.030 from the owner or tenant of real property, or receives such complaints from several such owners or tenants in a locale, the commission shall consider conducting a special hunt or special hunts to reduce the potential for such damage.

[1996 c 54 ' 3.]

RCW 77.36.030

Trapping or killing wildlife causing damage -- Emergency situations.

(1) Subject to the following limitations and conditions, the owner, the owner's immediate family member, the owner's documented employee, or a tenant of real property may trap or kill on that property, without the licenses required under RCW 77.32.010 or authorization from the director under RCW 77.12.240, wild animals or wild birds that are damaging crops, domestic animals, or fowl:

(a) Threatened or endangered species shall not be hunted, trapped, or killed;

(b) Except in an emergency situation, deer, elk, and protected wildlife shall not be killed without a permit issued and conditioned by the director or the director's designee. In an emergency, the department may give verbal permission followed by written permission to trap or kill any deer, elk, or protected wildlife that is damaging crops, domestic animals, or fowl; and

(c) On privately owned cattle ranching lands, the land owner or lessee may declare an emergency only when the department has not responded within forty-eight hours after having been contacted by the land owner or lessee regarding damage caused by wild animals or wild birds. In such an emergency, the owner or lessee may trap or kill any deer, elk, or other protected wildlife that is causing the damage but deer and elk may only be killed if such lands were open to public hunting during the previous hunting season, or the closure to public hunting was coordinated with the department to protect property and livestock.

(2) Except for coyotes and Columbian ground squirrels, wildlife trapped or killed under this section remain the property of the state, and the person trapping or killing the wildlife shall notify the department immediately. The department shall dispose of wildlife so taken within three days of receiving such a notification and in a manner determined by the director to be in the best interest of the state.

[1996 c 54 ' 4.]

RCW 77.36.040

Payment of claims for damages -- Procedure -- Limitations.

(1) Pursuant to this section, the director or the director's designee may distribute money appropriated to pay claims for damages to crops caused by wild deer or elk in an amount of up to ten thousand dollars per claim. Damages payable under this section are limited to the value of such commercially raised horticultural or agricultural crops, whether growing or harvested, and shall be paid only to the owner of the crop at the time of damage, without assignment. Damages shall not include damage to other real or personal property including other vegetation or animals, damages caused by animals other than wild deer or elk, lost profits, consequential damages, or any other damages whatsoever. These damages shall comprise the exclusive remedy for claims against the state for damages caused by wildlife.

(2) The director may adopt rules for the form of affidavits or proof to be provided in claims under this section. The director may adopt rules to specify the time and method of assessing damage. The burden of proving damages shall be on the claimant. Payment of claims shall remain subject to the other conditions and limits of this chapter.

(3) If funds are limited, payments of claims shall be prioritized in the order that the claims are received. No claim may be processed if:

(a) The claimant did not notify the department within ten days of discovery of the damage. If the claimant intends to take steps that prevent determination of damages, such as harvest of damaged crops, then the claimant shall notify the department as soon as reasonably possible after discovery so that the department has an opportunity to document the damage and take steps to prevent additional damage; or

(b) The claimant did not present a complete, written claim within sixty days after the damage, or the last day of damaging if the damage was of a continuing nature.

(4) The director or the director's designee may examine and assess the damage upon notice. The department and claimant may agree to an assessment of damages by a neutral person or persons knowledgeable in horticultural or agricultural practices. The department and claimant shall share equally in the costs of such third party examination and assessment of damage.

(5) There shall be no payment for damages if:

(a) The crops are on lands leased from any public agency;

(b) The landowner or claimant failed to use or maintain applicable damage prevention materials or methods furnished by the department, or failed to comply with a wildlife damage prevention agreement under RCW 77.12.260;

(c) The director has expended all funds appropriated for payment of such claims for the current fiscal year; or

(d) The damages are covered by insurance. The claimant shall notify the department at the time of claim of insurance coverage in the manner required by the director. Insurance coverage shall cover all damages prior to any payment under this chapter.

*(6) When there is a determination of claim by the director or the director's designee pursuant to this section, the claimant has sixty days to accept the claim or it is deemed rejected.
[1996 c 54 ' 5.]*

RCW 77.36.050

Claimant refusal -- Excessive claims.

If the claimant does not accept the director's decision under RCW 77.36.040, or if the claim exceeds ten thousand dollars, then the claim may be filed with the office of risk management under RCW 4.92.040(5). The office of risk management shall recommend to the legislature whether the claim should be paid. If the legislature approves the claim, the director shall pay it from moneys appropriated for that purpose. No funds shall be expended for damages under this chapter except as appropriated by the legislature.

[1996 c 54 ' 6.]

RCW 77.36.060

Claim refused -- Posted property.

The director may refuse to consider and pay claims of persons who have posted the property against hunting or who have not allowed public hunting during the season prior to the occurrence of the damages.

[1996 c 54 ' 7.]

RCW 77.36.070

Limit on total claims from wildlife fund per fiscal year.

The department may pay no more than one hundred twenty thousand dollars per fiscal year from the wildlife fund for claims under RCW 77.36.040 and for assessment costs and compromise of claims. Such money shall be used to pay animal damage claims only if the claim meets the conditions of RCW 77.36.040 and the damage occurred in a place where the opportunity to hunt was not restricted or prohibited by a county, municipality, or other public entity during the season prior to the occurrence of the damage.

[1996 c 54 ' 8.]

RCW 77.36.080

Limit on total claims from general fund per fiscal year -- Emergency exceptions.

(1) The department may pay no more than thirty thousand dollars per fiscal year from the general fund for claims under RCW 77.36.040 and for assessment costs and compromise of claims unless the legislature declares an emergency. Such money shall be used to pay animal damage claims only if the claim meets the conditions of RCW 77.36.040 and the damage occurred in a place where the opportunity to hunt was restricted or prohibited by a county, municipality, or other public entity during the season prior to the occurrence of the damage.

(2) The legislature may declare an emergency, defined for the purposes of this section as any happening arising from weather, other natural conditions, or fire that causes unusually great damage to commercially raised agricultural or horticultural crops by deer or elk to commercially raised agricultural or horticultural crops, or rangeland forage on privately owned land used for grazing or browsing of domestic livestock for at least a portion of the year. In an emergency, the department may pay as much as may be subsequently appropriated, in addition to the funds authorized under subsection (1) of this section, for claims under RCW 77.36.040 and for assessment and compromise of claims. Such money shall be used to pay animal damage claims only if the claim meets the conditions of RCW 77.36.040 and the department has expended all funds authorized under RCW 77.36.070 or subsection (1) of this section.

(3) Of the total funds available each fiscal year under subsection (1) of this section and RCW 77.36.070, no more than one-third of this total may be used to pay animal damage claims for rangeland forage on privately owned land.

(4) Of the total funds available each fiscal year under subsection (1) of this section and RCW 77.36.070 that remain unspent at the end of the fiscal year, fifty percent shall be utilized as matching grants to enhance habitat for deer and elk on public lands.

NEW SECTION Sec. 4. A new section is added to chapter 43.131 RCW to read as follows: The joint legislative audit and review committee must conduct program review, as provided in this chapter, of the program to reimburse landowners for damage to rangeland used for grazing or browsing of domestic livestock caused by deer and elk, established in sections 1 through 3, chapter..., Laws of 2001 (sections 1 through 3 of this act). The review must be completed by January 1, 2004.