

# *Washington State Deer Management Plan*

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## WHITE-TAILED DEER



Washington  
Department of  
**FISH and  
WILDLIFE**

November 2010

Photos By: Douglas Kikendall



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## **WHITE-TAILED DEER**

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

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# Table of Contents

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<b>WASHINGTON STATE DEER MANAGEMENT PLAN .....</b>	<b>III</b>
<b>TABLE OF CONTENTS.....</b>	<b>VII</b>
ACKNOWLEDGMENTS.....	IX
<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>CHAPTER 1 .....</b>	<b>3</b>
INTRODUCTION.....	3
PURPOSE.....	3
AUTHORITY.....	3
POPULATION DYNAMICS.....	5
DEER HUNTING IN WASHINGTON.....	7
STATEWIDE DEER MANAGEMENT DIRECTION .....	8
GEOGRAPHIC SCOPE .....	8
WHITE-TAILED DEER MANAGEMENT GOALS.....	9
<b>CHAPTER 2: WHITE-TAILED DEER MANAGEMENT .....</b>	<b>10</b>
2.1 SELKIRK ZONE .....	13
2.2 PALOUSE ZONE .....	27
2.3 BLUE MOUNTAINS ZONE .....	38
2.4 COLUMBIA BASIN ZONE.....	49
2.5 OKANOGAN HIGHLANDS ZONE.....	56
2.6 NORTH CASCADES ZONE.....	64
<b>CHAPTER 3: MANAGEMENT GOALS AND OBJECTIVES .....</b>	<b>74</b>
3.1 WHITE-TAILED DEER HABITAT MANAGEMENT .....	74
3.2 WHITE-TAILED DEER POPULATION MONITORING.....	76
3.3 WHITE-TAILED DEER HARVEST MANAGEMENT.....	78
3.4 LIVING WITH WHITE-TAILED DEER .....	82
3.5 EMERGENCY FEEDING OF DEER .....	85
3.6 DISEASES AFFECTING WHITE-TAILED DEER .....	86
<b>CHAPTER 4: RESEARCH &amp; INFORMATION NEEDS.....</b>	<b>88</b>
4.1 POPULATION ESTIMATION.....	88
4.2 SURVIVAL, MORTALITY, RECRUITMENT, AND AGE STRUCTURE OF POPULATIONS .....	88
4.3 WHITE-TAILED DEER MOVEMENTS AND RESOURCE SELECTION .....	89
4.4 WHITE-TAILED DEER HARVEST MANAGEMENT ASSESSMENTS.....	90
<b>CHAPTER 5: SPENDING PRIORITIES .....</b>	<b>91</b>
<b>LITERATURE CITED .....</b>	<b>94</b>
APPENDIX A WASHINGTON DEPARTMENT OF FISH AND WILDLIFE HUNTING SEASON GUIDELINES.....	97
APPENDIX B.1 SUMMARY OF GENERAL AND PERMIT DEER HUNTER NUMBERS, DAYS HUNTED, HARVEST SUCCESS, AND HUNTERS PER SQUARE MILE BY METHOD OF HUNTING WITHIN THE SELKIRK ZONE, 2001-2008.....	99
APPENDIX B.2 SUMMARY OF GENERAL AND PERMIT DEER HUNTER NUMBERS, DAYS HUNTED, HARVEST SUCCESS, AND HUNTERS PER SQUARE MILE BY METHOD OF HUNTING WITHIN THE PALOUSE ZONE, 2001-2008.....	101

APPENDIX B.3 SUMMARY OF GENERAL AND PERMIT DEER HUNTER NUMBERS, DAYS HUNTED, HARVEST SUCCESS, AND HUNTERS PER SQUARE MILE BY METHOD OF HUNTING WITHIN THE BLUE MOUNTAINS ZONE, 2001-2008. .... 103

APPENDIX B.4 SUMMARY OF GENERAL AND PERMIT DEER HUNTER NUMBERS, DAYS HUNTED, HARVEST SUCCESS, AND HUNTERS PER SQUARE MILE BY METHOD OF HUNTING WITHIN THE COLUMBIA BASIN ZONE, 2001-2008..... 105

APPENDIX B.5 SUMMARY OF GENERAL AND PERMIT DEER HUNTER NUMBERS, DAYS HUNTED, HARVEST SUCCESS, AND HUNTERS PER SQUARE MILE BY METHOD OF HUNTING WITHIN THE OKANOGAN HIGHLANDS ZONE, 2001-2008..... 107

APPENDIX B.6 SUMMARY OF GENERAL AND PERMIT DEER HUNTER NUMBERS, DAYS HUNTED, HARVEST SUCCESS, AND HUNTERS PER SQUARE MILE BY METHOD OF HUNTING WITHIN THE NORTH CASCADES ZONE, 2001-2008..... 108

APPENDIX C STATUTES RELATED TO DOMESTIC DOGS HARASSING WILDLIFE..... 112

APPENDIX D WASHINGTON DEPARTMENT OF FISH AND WILDLIFE POLICY GOVERNING FEEDING WILDLIFE. .... 113

APPENDIX E PREDATOR-PREY LITERATURE REVIEW..... 116

APPENDIX F WHITE-TAILED DEER PLAN DEVELOPMENT PROCESS AND TIMELINE..... 119



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# Executive Summary

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White-tailed deer in eastern Washington represent an important resource that provides substantial recreational, aesthetic, cultural, and economic benefit to Washington citizens and the Native American people of the area.

The purpose of this plan is to prescribe near-term direction for managing white-tailed deer. This is a five-year plan subject to amendment and is scheduled to be updated every five-years. This plan will serve as a valuable reference document and management guideline for the Washington Department of Fish and Wildlife, tribes, agency cooperators, landowners and the general public. **Priority management activities will be carried out as funding and resources become available.**

The major goals of this white-tailed deer management plan are to:

- Maintain and sustain white-tailed deer populations using sound, objective science to inform decision-making.
- Provide stable, regulated recreational deer hunting opportunity to all citizens.
- Manage white-tailed deer populations within the limits of suitable habitat.

White-tailed deer were found in abundance in the foothills and valleys of the Northwest by Euro-American explorers and trappers in the early 1800s. Presumably this species occurred in varying numbers, depending on annual climatic and habitat conditions, within the broader valley bottoms along the major river courses and at low elevation forest edges. Disturbance in forest stands created by fire, disease, and insect outbreaks typically enhanced habitat conditions for white-tailed deer.

Like other big game species, deer were used by both native tribes and Euro-American settlers and were generally subject to year-round subsistence hunting. As farming, logging, and other land uses changed the landscape, favorable habitat conditions for white-tailed deer were likely created on a broader scale. Newly created habitat coupled with stricter hunting regulations and widespread reduction of large predators at the end of the 19<sup>th</sup> century, facilitated a substantial resurgence in both white-tailed deer numbers and reoccupation of historical deer range.

From 2001 through 2008 white-tailed deer comprised approximately 35% of the annual hunter harvest of all deer in Washington including black-tailed and mule deer. Each year an average of 13,629 white-tailed deer were taken out of a statewide, average, annual harvest of 40,025 deer.

For the purpose of this plan the range of white-tailed deer within Washington State has been divided into six geographic zones based upon ecological and population characteristics as well as management considerations. The six zones include the following: Selkirk, Palouse, Blue Mountains, Columbia Basin, Okanogan Highlands, and North Cascades.

Specific management objectives are provided in categories relative to white-tailed deer habitat, populations, harvest management, mortality factors, and co-existence with people along with background information and strategies for addressing the objectives. They reflect key management issues and specific problems of white-tailed deer management.

Likewise, specific research objectives are identified for addressing information needs relative to white-tailed deer. Research objectives for population estimation, gathering vital rates, delineating movements and resource selection, and managing harvest are presented along with background information and strategies for addressing them.

Priorities for financial investment to implement the Washington White-tailed Deer Management Plan are divided into discrete objectives. These include high and medium priority objectives within categories of habitat and access, population and harvest management, research and management assessment, human and white-tailed deer conflicts, predation, and deer diseases.

Spending levels associated with this plan will be contingent upon availability of funds and creation of partnerships. The recommended prioritized expenditures for white-tailed deer are as follows:

Priority Expenditures	Current Annual Expenditures	First Year Needs Estimate	Five Year Needs Estimate
1. Habitat and Access	\$ 20,000	\$110,000	\$550,000
2. Population and Harvest Management	\$ 162,000	\$162,000	\$810,000
3. Research and Management Assessment	\$ 20,000	\$280,000	\$1,400,000
4. Human and White-tailed Deer Conflicts <sup>‡</sup>	\$38,000	\$78,000	\$390,000
5. Deer Diseases	\$ 50,000	\$50,000	\$250,000
<b>TOTAL</b>	<b>\$290,000</b>	<b>\$680,000</b>	<b>\$3,400,000</b>

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<sup>‡</sup> Represents both deer and elk wildlife conflict expenditures for Region 1.

# Chapter 1

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## Introduction

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The Washington Department of Fish and Wildlife (WDFW) serves Washington's citizens by protecting, restoring and enhancing fish and wildlife and their habitats, while providing sustainable, wildlife-related recreational and commercial opportunities. In the hierarchy of WDFW strategic plans, the overarching document that addresses the management of terrestrial game species is the Game Management Plan 2009-2015 (WDFW 2008). Like all game species management plans, this White-tailed Deer Management Plan comes under the direction of the Game Management Plan. Planning helps WDFW prioritize actions to ensure accomplishment of its mission.

## Purpose

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The purpose of the White-tailed Deer Management Plan is to assess current issues for white-tailed deer and outline strategies to help WDFW prepare for the future. The emphasis in this plan is the scientific management of white-tailed deer populations, harvest management, and other significant factors affecting deer populations. The plan is intended to be dynamic, and is designed to facilitate resolution of emergent issues and allow adjustment of priorities when issues are resolved. The issues and options in the plan are based on current management information. As new information becomes available, existing options may be modified or new ones developed.

This document will provide direction for the management of white-tailed deer in Washington. The plan will serve as a guideline for white-tailed deer management for WDFW, as well as agency cooperators, landowners, tribes, and the general public that have an interest in white-tailed deer. This is a five-year plan subject to amendment. Before the fifth year this plan should be updated for another five-year period. Priorities can be implemented as funding and other resources become available.

## Authority

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The establishment of hunting seasons and management of game species is consistent with the authorities granted the Fish and Wildlife Commission and Department of Fish and Wildlife by the Washington State Legislature through Title 77 of the Revised Code of Washington (RCW). The Fish and Wildlife Commission develops regulations under their authority through the adoption of Washington Administrative Code (WAC). In addition, various Commission and WDFW policies and procedures guide game management.

The Washington Fish and Wildlife Commission and Department of Fish and Wildlife are responsible for the management and protection of fish and wildlife resources in Washington State.

*The Washington Department of Fish and Wildlife serves Washington's citizens by protecting, restoring and enhancing fish and wildlife and their habitats, while providing sustainable, wildlife-related recreational and commercial opportunities.*

The Legislative mandate (RCW 77.04.012) for the Commission and WDFW includes the following for wildlife:

*“The commission, director, and the department shall preserve, protect, perpetuate, and manage the wildlife...*

*The department shall conserve the wildlife resources in a manner that does not impair the resource. The commission may authorize the taking of wildlife only at times or places, or in manners or quantities, as in the judgment of the commission does not impair the supply of these resources. The commission shall attempt to maximize the public recreational hunting opportunities of all citizens, including juvenile, disabled, and senior citizens.”* (See Title 77 Revised Code of Washington for the full extent of the statute).

This white-tailed deer management plan is intended to be consistent with the Game Management Plan 2009-2015 (WDFW 2008) and WDFW Hunting Season Guidelines (see Appendix A for full text of the guidelines):

*“Hunting seasons and regulation recommendations should be based on good science. When biological information is lacking or insufficient, management decisions should be conservative to ensure protection of wildlife resources. At no time should decisions favor income to the agency or recreation over protection of wildlife populations.”*

Implementing the Legislative mandate and Commission guidelines for game species requires knowledge of game population trends and impacts of hunting regulations, development and management of hunting seasons and actions that support maximizing sustainable public hunting opportunities, and implementation of basic principles of wildlife conservation. For white-tailed deer, as with other big game species, the Fish and Wildlife Commission adopts major hunting seasons every three years. Minor adjustments are made annually, such as modifying special permit levels or addressing crop damage or nuisance problems. The process for developing white-tailed deer hunting seasons typically includes:

1. Determine the status of game populations and impacts of previous harvest strategies.
2. Preliminary discussion of ideas with all stakeholders involved, including WDFW staff, the public, the tribes, other state agencies, and federal agencies.
3. Development of season and regulation alternatives.
4. A formal drafting of regulations and establishment of a public comment period in compliance with the Administrative Procedures Act.
5. Development of final recommendations by WDFW staff.
6. Adoption of regulations by the Fish and Wildlife Commission.

The process of establishing white-tailed deer hunting seasons, bag limits, and geographical areas where hunting is permitted is exempt from State Environmental Policy Act (SEPA) rules through WAC 197-11-840. In addition, feeding of game, issuing licenses, permits, and tags, routine release of wildlife or re-introductions of native wildlife are also listed as exemptions from SEPA rules. However, policy development, planning, and all other game management actions are not considered exempt from SEPA rules.

## Population Dynamics

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The four primary influences on white-tailed deer population dynamics in Washington are weather, habitat, predation, and hunting. None of these factors operates in isolation, but rather are variables working in concert as part of a functioning ecosystem.

### Weather

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Annual weather events can influence deer populations in a number of ways. Cold, wet springs can negatively impact fawn survival. Drought conditions in both the summer and fall, and the resultant effects on forage can influence lactation, body condition, fat reserves, and ultimately survival. Severe winter conditions, especially deep or frozen and crusted snow can increase winter mortality well above the average.

### Habitat

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Habitat affects all aspects of white-tailed deer population dynamics. The quantity and quality of forage available influences the ability to become pregnant, the ability to carry a fawn to term, the amount and quality of milk produced by lactating females, the ability to accumulate fat reserves for the winter, and potentially even the level of vulnerability to predation. Another aspect of habitat is security cover. The ability to avoid detection and escape threats is important to deer survival.

*The four primary influences on white-tailed deer population dynamics in Washington are weather, habitat, predation, and hunting.*

### Predators

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Predators that prey on white-tailed deer include bobcat, coyote, black bear, and cougar. In rural counties, domestic dogs can also be a source of predation for white-tailed deer. As gray wolf numbers increase in Washington they will also become an important part of that suite of predators.

In their research on white-tailed deer in the Salish Mountains of northwest Montana, Dusek et al. (2006) found that predation was the leading cause of death for fawns over their first winter and the second most important source of mortality for adults of both sexes. Hunting mortality was the primary source of mortality for adults except for adult females in those years when hunting regulations protected does from harvest. WDFW has not explored the predator-prey relationships of white-tailed deer and the suite of predators that prey on them.

The following are descriptions of white-tailed deer predators. In addition, each white-tailed deer zone covered in Chapter 2 includes a discussion on bear and cougar population status and harvest trends.

#### Bobcat

Bobcats are distributed throughout all of the white-tailed deer zones. Although sometimes capable of taking adult deer, the primary impact by bobcat to white-tailed deer populations would be through predation on fawns. The bobcat hunting season runs from September 1 to March 15. A small game license is required to hunt bobcat. WDFW assesses the bobcat harvest via trapper catch reports and CITES carcass checks. Reported bobcat harvest has declined since 2000 when Voter Initiative 713 made trapping more restrictive.

#### Coyote

Coyotes are ubiquitous in Washington and occur in all of the white-tailed deer zones. Coyotes prey on fawns in the spring. They are also able to take adult deer in certain situations such as deep snow

conditions when deer mobility is reduced. Currently there are no closed seasons or bag limits related to coyote hunting. Coyote hunters must possess either a small game license or a big game license to hunt coyotes. Coyote harvest is typically ancillary to another active hunting season occurring at the time. Hunters that specifically target predators like coyotes are most active during the winter months, but those numbers are likely small. WDFW assesses the coyote harvest via the small game harvest survey and trapper catch reports. Reported coyote harvest has declined since 2000 when Voter Initiative 713 made trapping more restrictive.

### Black Bear

Washington is divided into 9 black bear management units. Five of those units overlap the white-tailed deer zones. Black bears are classified as game animals and are hunted under the big game hunting season structure. The current black bear hunting season guidelines are designed to maintain black bear populations at their current level and those population levels are not expected to result in increased impacts to deer populations. The metrics used to direct black bear harvest include the percent of females in the harvest, the median age of harvested females, and the median age of harvested males. The black bear harvest guidelines are specified in the Game Management Plan 2009-2015 (WDFW 2008:80).

There is limited research related to black bear/white-tailed deer, predator-prey interactions. Recent research projects that included black bear predation on white-tailed deer fawns were conducted in areas where black bear populations were abundant. In evaluating mortality of marked fawns in New Brunswick, Ballard et al. (1999) reported 37% of annual mortality was attributed to coyotes; 14% of annual mortality caused by black bears; 8% attributed to domestic dogs; 6% to bobcats; and 7% to unknown causes. In northern Minnesota, Carstensen et al. (2006) documented black bears accounting for 36% and 29% of annual mortality of marked white-tailed deer fawns in the first and second years of their study respectively. Bobcats were the second most important predator accounting for 9% and 46% of annual fawn mortality in the two study years. Coyotes were not present on the study site and gray wolves and red fox had a minor predation impact. Vreeland et al. (2004) investigated white-tailed deer fawn survival in both forested and agricultural habitat in Pennsylvania. Of the predation mortalities only, black bear accounted for 12.5% on the agricultural study site and 36.6% on the forested study site. Forested habitats with abundant black bear populations seem to be the most likely settings where black bears may have an impact on white-tailed deer fawn survival.

### Cougar

Washington is divided into 9 cougar management units. Cougars are classified as game animals and are hunted under the big game hunting season structure. Most populations are managed to maintain a stable cougar population. Population objectives are met by managing for an annual female harvest quota in each cougar management unit (WDFW 2008:89-94).

### Gray Wolf

Gray wolves require a prey base of ungulates to be successful. In Washington, the primary prey species will be moose, elk and deer, including white-tailed deer. Gray wolves are naturally dispersing into Washington from populations in adjacent states and British Columbia and establishing packs defined as “two or more animals traveling together” (WDFW 2009). At the time of this writing there is a confirmed gray wolf pack in Pend Oreille County, and a pack that overlaps Pend Oreille County and British Columbia. There was a pack in Okanogan/Chelan counties, but its status at the time of this writing is unknown following the disappearance of the breeding female. The prey base for the Pend Oreille packs is moose, elk and deer; and for the Okanogan/Chelan pack the prey base is primarily deer. There is a pack in Oregon, just south of the state line, but to date it has not been using Washington habitat. There is a suspected pack in the Wenaha-Tucannon

Wilderness of southeastern Washington, but it has not been confirmed. Estimates in the WDFW Draft Wolf Conservation and Management Plan (WDFW 2009) suggest that, if they were only preying on deer, wolves may kill and consume 44 deer per wolf per year. In Washington, wolves will likely rely primarily on elk and moose; in areas with few or no elk, deer will likely serve as primary prey, as is the case with the Okanogan/Chelan area. Secondary prey will likely include rabbits, rodents, birds, etc. Gray wolves are currently state and federally listed as an endangered species. Before wolves could be classified as a game species they would have to be recovered and delisted at the state and federal level.

### **Predator Control**

Whenever population enhancement of game species is discussed, the discussion inevitably leads to predation and predator control. The topic of predator control has been around for as long as modern wildlife management has been in existence (Leopold 1933, 1949, Edminster 1939, Errington 1946). The topic of predator control was just as controversial seventy-five years ago as it is today. Although WDFW has implemented predator control strategies to benefit endangered species like woodland caribou, pygmy rabbits, sharp-tailed grouse, and salmon, it has not undertaken similar management actions to benefit a relatively abundant game species like deer or elk.

Predator control as it relates to deer management has been covered in the scientific literature on numerous occasions. The authors did an extensive, but by no means exhaustive literature search on the topic of predator control, mostly as it pertains to deer (see Appendix E). For the sake of both brevity and practicality, we have focused our summary in Appendix E on the deer-coyote interaction.

In Washington, as is the case in virtually all western states, black bear and cougar are managed as big game animals. Management objectives that target increasing or decreasing black bear or cougar populations can be accomplished through established big game hunting seasons rather than control measures. Although some research has been conducted relating to manipulating bear or cougar populations and the resultant response by other cervids (e.g. elk), there is very limited information addressing manipulating black bear or cougar populations to benefit white-tailed deer.

## **Hunting**

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Although WDFW doesn't have any specific research data to date, based on research in other states, it is most likely that hunting is the most important source of annual mortality for white-tailed deer in Washington. The average total white-tailed deer harvest from 2001-2008 in Washington is over 13,500 deer.

### **Deer Hunting in Washington**

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The number of licensed hunters, including deer hunters, in the state of Washington grew rapidly with the increase in leisure-time and income resulting from the industrial revolution. Deer numbers were also on the rise as a result of stricter game laws. From 1933 to 1953, hunting license sales showed an increasing trend. That trend was steepest following World War II. Sales of combination hunting and fishing licenses peaked in 1953 at approximately 445,000 (county and state).

In 1954, hunting licenses and fishing licenses were separated which resulted in a drop in total license sales. This drop most likely reflects the number of fishers who chose not to purchase a state hunting license. Since the separation of licenses, hunter numbers peaked in 1979. It is likely that



deer hunter numbers and specifically white-tailed deer hunter numbers followed those trends. Since 1989, there has been no clear trend in hunter numbers. Washington's human population, however, has steadily grown over that same time period.

During the 1970s, big game hunter numbers in Washington were at an all time high. Hunter crowding, competition among hunters, and the declining quality of the hunting experience resulted in significant hunter dissatisfaction. As a result, many hunters changed from the use of modern firearms to primitive archery equipment and black powder muzzle loading rifles to take advantage of less-crowded hunting conditions. In 1984, after a great deal of debate and broad public involvement, the Fish and Wildlife Commission adopted a major change in deer hunting. This new rule required all deer hunters to select one type of season and equipment. In many cases, separating deer hunters by hunting method has reduced crowding, better spread hunting pressure across the landscape, and has also increased opportunity for archers and muzzleloaders.

For a more complete treatise on the history of hunting in Washington as well as a complete description of Resource Allocation we refer the reader to the Game Management Plan 2009-2015 (WDFW 2008). For the guiding principles related to developing hunting seasons for deer see the WDFW Hunting Season Guidelines (Appendix A).

## **Statewide Deer Management Direction**

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Washington State contains populations for three types of deer: white-tailed, black-tailed, and mule deer. The statewide management goals for all deer in Washington are:

1. Preserve, protect, perpetuate, and manage deer and their habitat to ensure healthy and productive populations.
2. Manage deer for a variety of recreational, educational, and aesthetic purposes including hunting, scientific study, cultural, subsistence, and ceremonial uses by Native Americans, wildlife viewing, and photography.
3. Manage statewide deer populations for a sustainable harvest (WDFW 2008).

## **Geographic Scope**

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For management and administrative purposes, WDFW has apportioned the state into six white-tailed deer zones (Figure 2.1). Within a zone the soil, climate, elevation, topography, land use practices, and white-tailed deer ecology are generally similar. Those areas where white-tailed deer are not a management priority have not been included in a zone. Columbian white-tailed deer, which occur in southwestern Washington and Oregon, are state listed as an endangered species and are therefore not included in a zone. As an endangered species, Columbian white-tailed deer are managed under a distinct recovery program that is separate from this management plan.

Administrative areas relating to white-tailed deer include white-tailed deer zones, population management units (PMUs), game management units (GMUs), and deer areas in a descending order of scale. PMUs are groups of game management units that have similar characteristics, that are in relatively close proximity, and that are inhabited by deer that have a reasonable probability of genetic interchange. GMUs are geographic units used to direct hunter activity and hunting seasons. Deer areas are typically smaller scale than GMUs and allow WDFW managers to focus hunters and hunter activity to specific areas to address issues that cannot be resolved at the GMU scale.

## **White-tailed Deer Management Goals**

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The goals of the white-tailed deer plan are:

- Manage and sustain white-tailed deer populations using sound, objective science to inform decision-making.
- Provide stable, regulated recreational white-tailed deer hunting opportunity to all citizens.
- Provide a diversity of white-tailed deer hunting opportunity.
- Manage white-tailed deer populations within the limits of suitable habitat.
  - White-tailed deer will be managed in suitable habitats in eastern and central Washington, including areas of overlap with mule deer.
  - Except for the recovery efforts by both U.S. Fish and Wildlife Service (USFWS) and WDFW related to the endangered Columbian white-tailed deer subspecies, white-tailed deer expansion into western Washington is not expected.
- Identify critical information needs to improve white-tailed deer management.
- Protect and enhance white-tailed deer habitat when possible. Encourage private landowners and land management agencies to increase and enhance white-tailed deer habitat.
- Minimize adverse impacts by white-tailed deer to Washington citizens and their property, other wildlife, and the environment.
- Develop a better understanding of white-tailed deer populations in Washington.
- Monitor the general health of white-tailed deer and monitor for disease and other aspects of general health in white-tailed deer.

## Chapter 2: White-tailed Deer Management

For the purpose of this plan the range of white-tailed deer within Washington State has been divided into six geographic zones based on ecological and population characteristics as well as management issues/strategies. Figures 2.1, 2.2, and 2.3 depict the topography, land ownership patterns, and land cover classes for each of these management zones respectively. General characteristics of each management zone are summarized in Table 2.1.

Table 2.1. Characteristics of white-tailed deer management zones in Washington.

CHARACTERISTIC	Z O N E					
	Selkirk	Palouse	Blue Mtns	Columbia Basin	Okanogan Highlands	North Cascades
Game Management Units	105, 108, (109)**, 111,113, 117, 121, 124	127, 130, 133, 139, 142, 145, 149	154, 157, 162, 163, 166, 169, 172, 175, 178, 181, 186	136, 272, 278, 284, 290, 373, 379, 381	101, 204	209, 215, 218, 224, 231, 233, 239, 242, 243, 247, 250
Surface area ( <i>square miles</i> )	4,528	5,866	1,739	8,774	4,286	3,443
Public land	37%	6%	37%	14 %	31 %	72 %
Private land	57%	94%	63%	86 %	19 %	28 %
Indian reservation	6%	< 0.1%	< 1%	0%	50%	< 0.1%
Major land cover	Forest	Agriculture & Rangeland	Forest & Rangeland	Agriculture & Rangeland	Forest & Rangeland	Forest & Rangeland
Acres in Federal Conservation Reserve Program as of 2007	5,928	333,700	50,042	479,117	82	373
Road density ( <i>miles of road per square mile</i> )	3.1	2.1	1.9	1.9	2.3	2.3
Average annual deer harvest* (2001-2008)	8,754	5,074	1,852	1,562	1,947	2,936
Average annual white-tailed deer harvest (2001-2008)	8,488	2,497	1,012	116	1,228	288
Average annual harvest of antlered white-tailed deer (2001-2008)	5,964	1,739	583	96	824	211
Average white-tailed deer harvest density, 2001-2008 ( <i>white-tailed deer taken per square mile</i> )	1.87	0.43	0.58	0.01	0.29	0.08
Average proportion of white-tailed deer bucks with five or more antler points on high side (2001-2008)	16%	26%	20%	28%	18%	17%

\* Combines both white-tailed and mule deer

\*\* Former GMU that no longer exists

Since 2001, an average of 40,025 deer (includes all species: white-tailed deer, black-tailed deer, and mule deer) have been harvested annually throughout Washington. The white-tailed deer harvest makes up approximately 35% of all deer taken for an average of 13,627 each year. Antlered bucks comprise about 69% of the annual white-tailed deer harvest. Approximately 19% of these bucks had at least five antler points on the larger of the two antlers (WDFW 2009).

Figure 2.1. Elevation variation of white-tailed deer management zones in Washington.

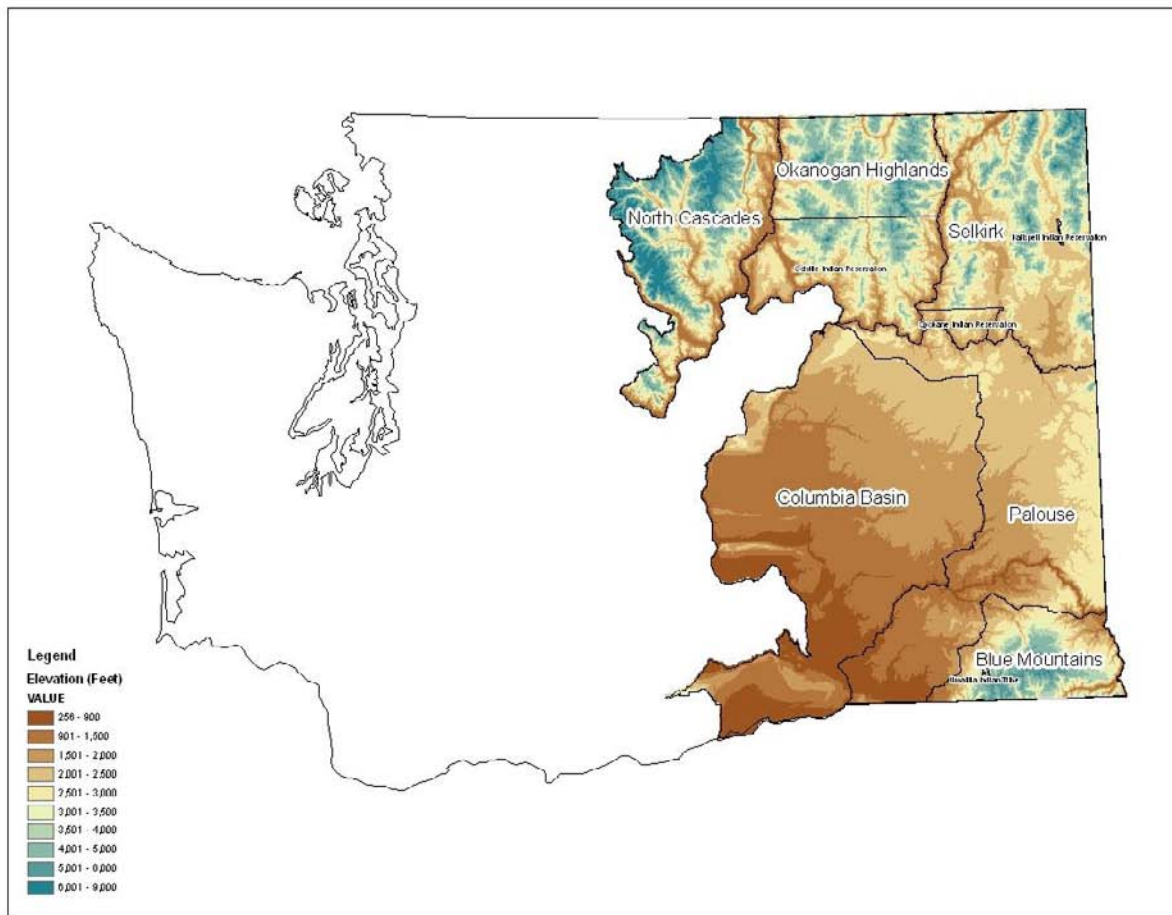


Figure 2.2. Land ownership patterns of white-tailed deer zones in Washington.

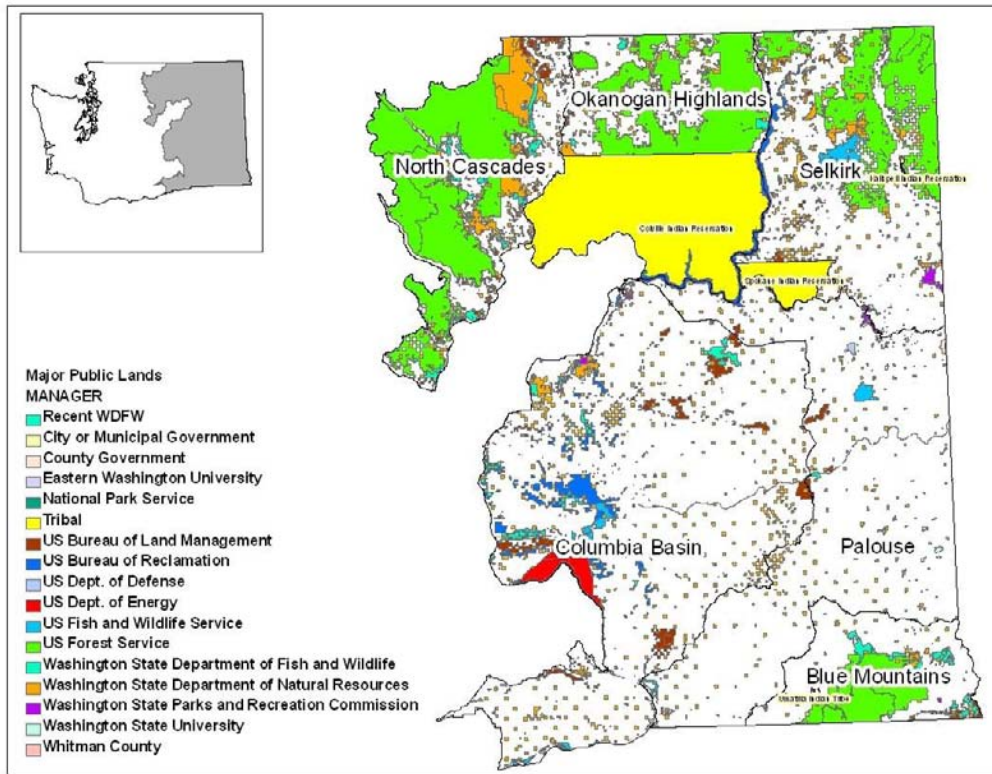
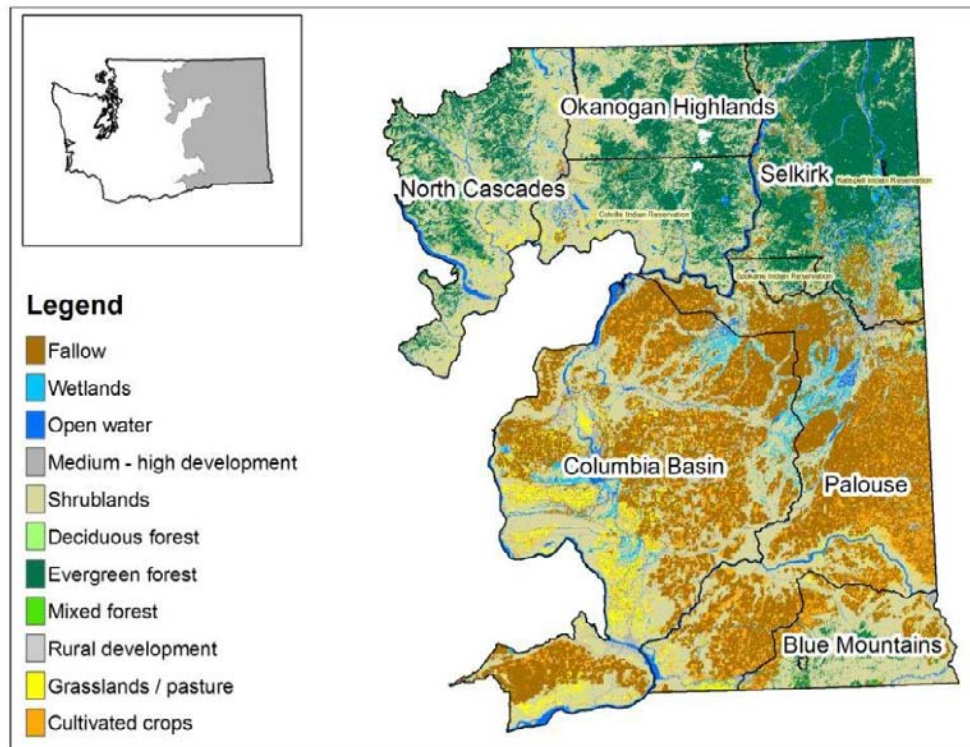


Figure 2.3. Land cover classes within white-tailed deer zones in Washington.



## 2.1 Selkirk Zone

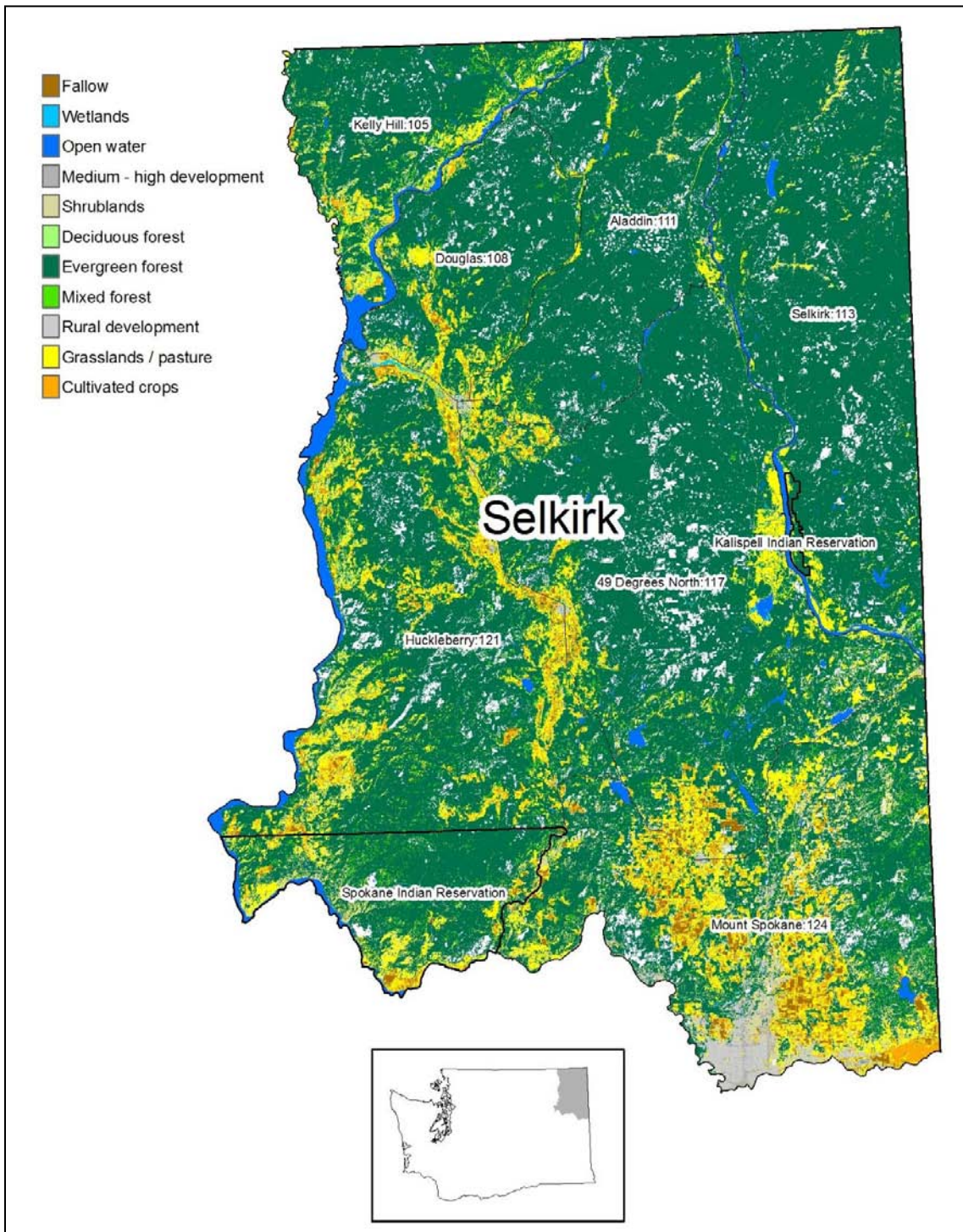


Figure 2.4. Selkirk White-tailed Deer Management Zone.

## Population Goal

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Increase the deer counted per mile in the late summer surveys to fall within the range of 9 to 11 deer counted per survey mile. Increase the white-tailed deer harvest success rate and the white-tailed deer buck success rate in data collected at check stations<sup>†</sup> and through hunter reporting to more closely reflect the 2003 to 2007 average rates.

### *Selkirk Zone Population Goal – Increase*

#### Strategy:

- Reduce the amount of antlerless hunting opportunity, while still attempting to maintain some opportunity for all user groups.

At the time of this writing, the white-tailed deer population in the Selkirk Zone is recovering from two severe winter events. Current hunting season structures are designed to increase the deer population by reducing antlerless harvest. White-tailed deer are distributed throughout the Selkirk Zone, but in varying densities. Outside of winter months about 95% of 4,528 square mile Selkirk Zone is white-tailed deer habitat to varying degrees.

White-tailed deer densities may range from 6 or fewer per square mile in low quality habitat such as dense conifer forest at the highest elevations to 30 or more deer per square mile within high quality habitat such as the agricultural-forest mosaic adjacent to valley bottoms. Because winter range is likely one of the limiting factors, the year-round deer density for the zone is likely much lower. Assuming a conservative overall population density of 8 or 9 white-tailed deer per square mile, the Selkirk Zone could harbor a population of about 35,000 to 39,000 white-tailed deer. Moreover this estimate represents a highly dynamic number throughout the year for the true population when fawning, migration, and mortality from winter-kill, predation, and hunting are all considered.

To date, a reliable estimate of the deer population size has been out of reach due to staff and funding limitations. As a result management decisions are often made with indices or surrogates of population size. Two of these indices used within the Selkirk Zone include annual late summer (pre-modern firearm season) composition counts (Table 2.2) and hunter check station data (Table 2.3). These two survey efforts carried out consistently in recent years point to a decline in the white-tailed deer population in the Selkirk Zone.

The late summer survey data shows for the first five years of the data set show relative stability with some expected variability around the mean. The most recent two years of data, however, show a steeper decline in numbers of deer surveyed per mile. The deer surveyed per mile had ranged from

*Two of these indices used within the Selkirk Zone include annual late summer (pre-modern firearm season) composition counts and hunter check station data. These two survey efforts carried out consistently in recent years point to a decline in the white-tailed deer population in the Selkirk Zone.*

<sup>†</sup> Hunters are not required to stop at biological check stations, therefore data may be biased by those successful hunters that do not voluntarily stop.

9.0 to 10.9 per mile before the decline. Check station data for the same time period shows a decrease in success rates and total white-tailed deer checked. Changes in hunting seasons have been established to reverse this downward trend.

Table 2.2. Late summer surveys of white-tailed deer from 6 road transects run with consistent effort, 2003-2009.		2003	2004	2005	2006	2007	2008	2009
Transect Name and GMU:	Length, miles (total = 73.1)	White-tailed deer counted						
Flat Creek – 105	17.5	116	123	138	147	117	143	122
Douglas – 108	11.0	231	288	198	304	190	177	131
Deep Creek – 108 / 111	19.8	38	42	48	54	84	79	78
Clayton – 117	7.2	95	58	51	83	97	61	48
Dunn Mountain – 121	5.3	189	213	192	165	161	106	42
Daisy / Maud – 121	12.3	48	43	33	51	45	75	50
<b>Total White-tailed Deer Counted</b>		<b>717</b>	<b>767</b>	<b>660</b>	<b>804</b>	<b>694</b>	<b>641</b>	<b>471</b>
<b>Deer per Transect Mile</b>		<b>9.8</b>	<b>10.5</b>	<b>9.0</b>	<b>11.0</b>	<b>9.5</b>	<b>8.8</b>	<b>6.4</b>

Table 2.3. Trend in deer hunter check stations run annually within the Selkirk Zone, 2003-2009.							
Deer Hunter Check Stations by Year:	2003	2004	2005	2006	2007	2008	2009
Check Station Days	4	5	6	6	6	6	6
Total Number of Deer Hunters Interviewed at Check Stations	756	884	913	996	848	784	702
Total White-tailed Deer Checked at Check Stations	131	156	167	211	186	88	76
Total White-tailed Bucks Checked at Check Stations	99	124	129	146	125	65	57
Total Antlerless White-tailed deer Checked (includes does & fawns)	32	32	38	65	61	23	19
White-tailed Deer Harvest Success Rate for All Check Stations	17%	18%	18%	21%	22%	11%	11%
White-tailed Buck Harvest Success Rate for All Check Stations	13%	14%	14%	15%	15%	8%	8%
White-tailed Deer Checked per Station per Day	33	31	28	35	31	15	13
White-tailed Bucks Checked per Station per Day	25	25	22	24	21	11	10



## Management Direction for White-tailed Deer in the Selkirk Zone

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The current management emphasis in the Selkirk Zone is to maintain white-tailed deer populations that support hunting recreation and hunter success at sustainable levels. The white-tailed deer population in the Selkirk Zone has been able to sustain hunting seasons that are relatively liberal. Fairly long time periods are allowed for hunting for all user groups, as compared to other white-tailed deer zones in the state. Moreover, user groups such as youth, seniors, and hunters with disabilities have been allowed additional opportunities for antlerless white-tailed deer during years when WDFW was trying to keep the population from growing too rapidly. Hunting seasons in the Selkirk Zone are the least restrictive of all the zones and as such provide a tremendous amount of hunting opportunity for all groups, ranging from first-time hunters to the most experienced deer hunters.

White-tailed deer have the highest reproductive potential of all North American ungulates (McCullough 1987). To fully realize that potential, white-tailed deer must reside on the best habitat. When good habitat is available, white-tailed deer in the Selkirk Zone will express that reproductive potential. But this expression of productivity and survival can be limited by severe weather events typically in the winter. At the time of this writing, the Selkirk Zone is coming off two back-to-back severe winters in 2007-08 and 2008-09.

White-tailed deer are much more abundant than mule deer within the Selkirk Zone, and as such have longer and more liberal hunting seasons. By evaluating annual survey data, annuals harvest data, and check station data, WDFW has not identified any problems with the cross section of age classes in either the buck or doe segments of the white-tailed deer population in the Selkirk Zone. This has not always been the case in other white-tailed deer zones in Washington, nor has it been the case for mule deer in most of eastern Washington.

Constituents and elected officials have expressed strong opinions with regard to the white-tailed deer population specifically in District 1, most of which is located in the Selkirk Zone. In recent years a well organized contingent of Washington deer hunters, most of whom live in the Selkirk Zone, have expressed an earnest desire to promote ideas set forth by the "Quality Deer Management Association™" located in Bogart, Georgia.

Quality Deer Management (QDM) has had varying levels of success in the eastern United States where hunt clubs on leased hunting properties can impose more restrictive regulations through various disincentives, and hunter density and hunter effort can be more strictly controlled as compared to the same metrics on public land with little or no access restrictions. One primary idea promoted by the QDM contingent is an objective to reduce the harvest of younger bucks, often through antler restrictions imposed during hunting seasons, in an attempt to increase the number of older bucks in the post-hunt sub-population. Another aspect of QDM is the promotion of relatively high antlerless harvest in an attempt to manage for lower overall deer densities and more available resources for the annual post-hunt deer population (Miller and Marchington 1995, Brothers and Ray 1998).

*White-tailed deer have the highest reproductive potential of all North American ungulates (McCullough 1987). To fully realize that potential, white-tailed deer must reside on the best habitat. When good habitat is available, white-tailed deer in the Selkirk Zone will express that reproductive potential. But this expression of productivity and survival can be limited by severe weather events typically in the winter.*

In addition, there are other engaged stakeholders that feel three-point or even four-point antler restrictions in the hunting season structure are warranted to alter the age structure and the bucks available for harvest in the Selkirk Zone, without incorporating all of the aspects of QDM. WDFW has implemented similar antler point restrictions in other locations for both mule deer and white-tailed deer, but in those cases, the post-hunt populations were not meeting population objectives, so more restrictive season structures were warranted. In the Selkirk Zone there has not been a problem meeting post-hunt population objectives. If majority public opinion favors more restrictive hunting seasons, WDFW will be responsive to those desires.

When polled in 2008, white-tailed deer hunters who hunted the Selkirk Zone shared a common value, whether they lived in the zone or travelled to the zone to deer hunt. That commonality was to maintain high quality, “family friendly” hunting opportunities. This entails offering the most liberal seasons possible for each main user group (archery, muzzleloader, and modern firearm) without negatively impacting the white-tailed deer populations and facilitating “equitable” harvest proportions of mature bucks among the three main user groups. WDFW will continue to monitor indices such as the proportion of 5+ antler point bucks appearing in the harvest annually. WDFW will continue to communicate with all interested stakeholders when considering more restrictive hunting season structures to meet the desires of the hunting public.

### Objective 2.1.1

WDFW will engage with vested stakeholders and the general public regarding hunting season structures and antler point restrictions in the Selkirk Zone.

#### **Strategies**

- Meet with stakeholders and discuss the pros and cons of implementing antler point restrictions in the Selkirk Zone.
- Conduct public meetings throughout the state to take public comment on initiating an antler point restriction for white-tailed deer in the Selkirk Zone.
- Develop hunting season recommendations based on the stakeholder meetings and the public meetings.

**Timeline:** Stakeholder meetings and public meetings summer of 2010  
Hunting season recommendations by end of 2010

**Priority:** High

**Cost:** Covered under current operational costs

*When polled in 2008, white-tailed deer hunters who hunted the Selkirk Zone shared a common value, whether they lived in the zone or travelled to the zone to deer hunt. That commonality was to maintain high quality, “family friendly” hunting opportunities. This entails offering the most liberal seasons possible for each main user group without negatively impacting the white-tailed deer populations and facilitating “equitable” harvest proportions of mature bucks among the three main user groups.*

## Description

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The Selkirk White-tailed Deer Management Zone is 4,528 square miles and includes Game Management Units (GMUs) 105, 108, 111, 113, 117, 121, and 124 (Figure 2.4). Most of this zone consists of private land (approximately 57%). Public land comprises about 37% and Indian Reservation approximately 6% of the surface area (Figure 2.5 and Table 2.4). Coniferous forest covers about 68% of the landscape, with most of the remainder in agricultural and range land (Figure 2.6 and Table 2.5). The overall road density is 3.1 miles of roadway per square mile.

The current general hunting seasons for white-tailed deer include 31 days of modern firearm, seven days of muzzleloader, and 56 days of archery seasons. Modern firearm hunters are allowed a legal harvest of one antlered deer unless they are youth, senior, disabled, or special permit holders. Users in these latter groups are allowed to take any white-tailed deer during the October season. Archery and muzzleloader hunters may legally harvest any white-tailed deer during their respective seasons. Various numbers of special permits for antlered or antlerless white-tailed deer are allocated annually by lottery draw amongst the different user groups.

The Kalispel Tribe of Indians and the Spokane Tribe of Indians can promulgate regulations for their members to hunt white-tailed deer on their reservations, but do not have an off-reservation hunting right. The Colville Confederated Tribes retained an off-reservation hunting right within the former “North Half” of their reservation. A portion of the Selkirk Zone, GMU 105–Kelly Hill, is included in the former “North Half” and the Colville Confederated Tribes can promulgate hunting regulations for their members to hunt white-tailed deer within GMU 105.

Table 2.6 presents a summary of recent deer harvests within the Selkirk Zone. From 2001 through 2008, the annual average harvest of white-tailed deer was 8,488, which was higher than for any other zone. The average number of antlered white-tail bucks taken annually was 5,964. Appendix B.1 summarizes deer hunter densities and harvest success rates by hunting method on an individual GMU basis. Deer hunter densities have ranged from less than one to nearly ten hunters per square mile within each of the seven GMUs comprising the Selkirk Zone, depending upon the year and hunting method.

Typically, hunter densities are substantially lower during archery and muzzleloader seasons than during modern firearm seasons. Hunter densities also tend to be lower in GMUs that predominately consist of private land. Generally speaking, one in three hunters harvest a deer each year, depending upon the GMU and hunting method - archery, muzzleloader, or modern firearm (Appendix B.1). Hunter harvest of mature white-tailed bucks with five or more antler points on the larger antler averaged 16% during 2001–2008 (Figure 2.8).

Figure 2.5. Major categories of landowners within the Selkirk Zone.

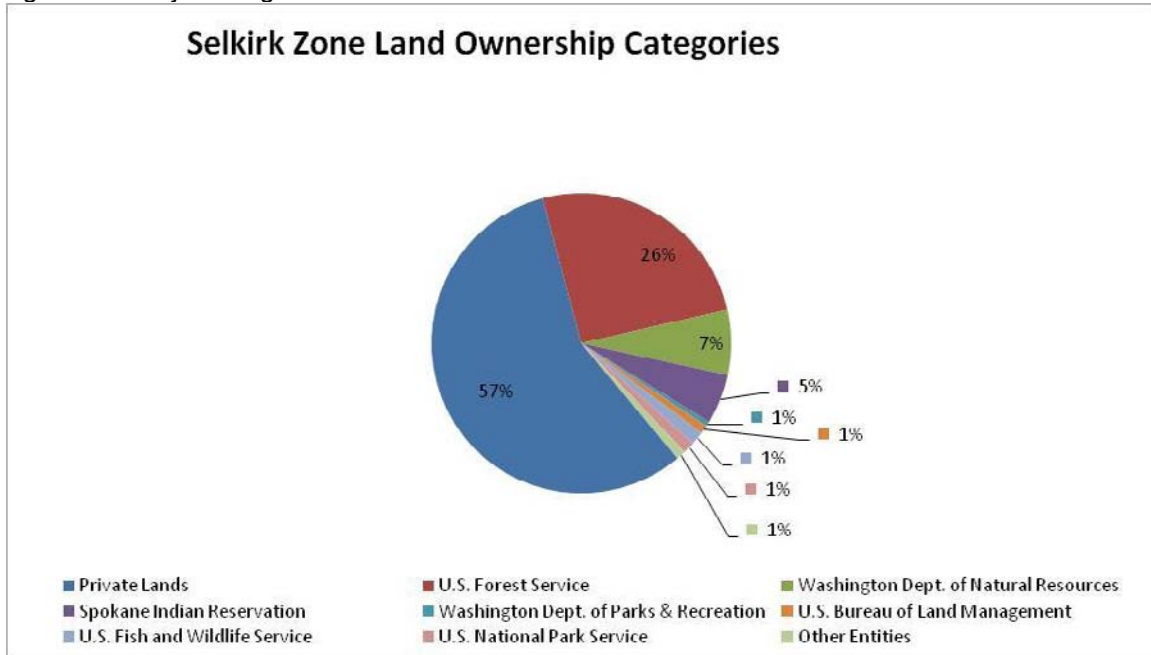


Table 2.4. Major landowner categories within the Selkirk Zone.

Landowner Category	Acres	Percentage
Private Lands	1,669,969	57.6%
U.S. Forest Service	740,807	25.6%
Washington Department of Natural Resources	203,088	7.0%
Spokane Indian Reservation	156,921	5.4%
U.S. Fish and Wildlife Service	40,565	1.4%
U.S. National Park Service	37,153	1.3%
U.S. Bureau of Land Management	25,926	0.9%
Washington Department of Parks & Recreation	14,768	0.5%
Kalispel Indian Reservation	5,180	0.2%
Municipal Government	2,909	0.1%
Washington Department of Fish & Wildlife	717	< 0.1%
<b>Total Acreage of Zone:</b>	<b>2,898,003</b>	<b>100.0%</b>

Figure 2.6. Major categories of land cover within the Selkirk Zone.

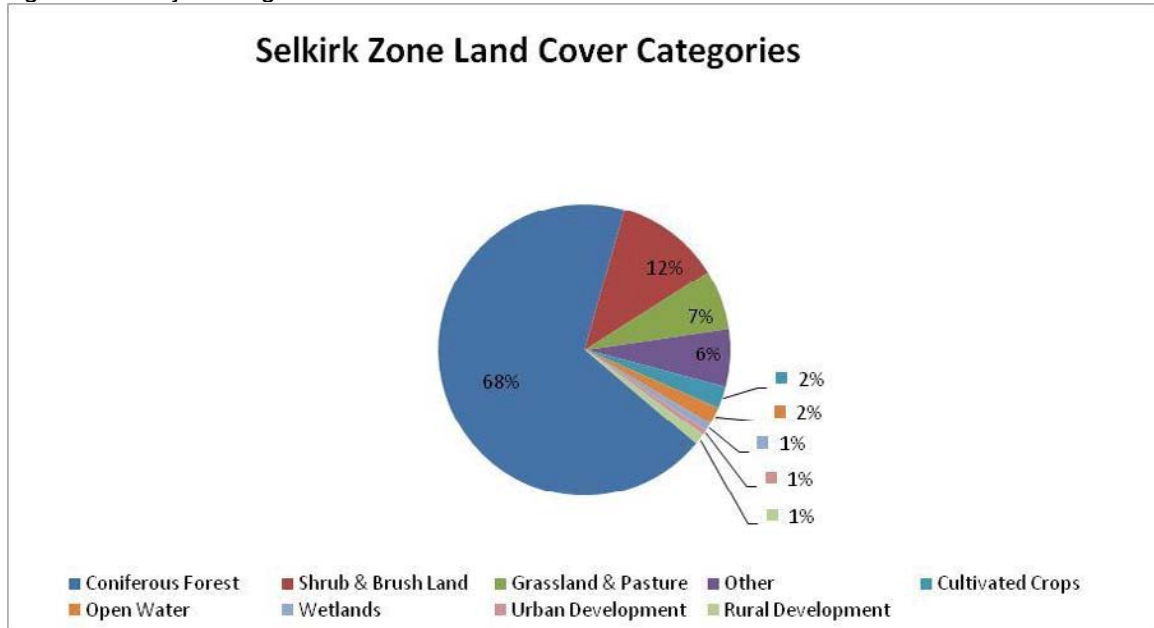


Table 2.5. Major land cover classes within the Selkirk Zone.

Land Cover Category	Acres	Percentage
Coniferous Forest	1,976,437	68.2%
Shrub & Brush Land	336,917	11.6%
Grassland & Pasture	190,689	6.6%
Other	185,918	6.4%
Cultivated Crops	70,184	2.4%
Open Water	55,709	1.9%
Rural Development	33,802	1.2%
Wetlands	27,370	0.9%
Urban Development	16,449	0.6%
Broad-leaf Forest	4,528	0.2%
<b>Total Acreage of Zone:</b>	<b>2,898,003</b>	<b>100.0%</b>

## Historical Perspective

White-tailed deer were found in abundance in the foothills and valleys of the Northwest by Euro-American explorers and trappers in the early 1800s (Hall 1984, Dusek et al. 2006). Presumably this species occurred in varying numbers, depending on annual climatic and habitat conditions, within the broader valley bottoms along the major river courses and at low elevation forest edges (Dalquest 1948, Ingles 1965). Seral conditions (i.e., not yet reaching climax stage) within forest stands created by disturbances like fire, disease, and insect outbreaks typically enhanced habitat conditions for white-tailed deer. Like other big game species, deer encountered in these early days by both native tribes and Euro-american settlers were generally subject to year-round subsistence hunting. As farming, logging, and other land uses changed the landscape, favorable habitat conditions for

white-tailed deer were created on a broader scale. The newly created habitat coupled with stricter hunting regulations and wide-spread reduction of large predators at the end of the 19<sup>th</sup> century facilitated a substantial resurgence in white-tailed deer numbers and range expansion. More recently, white-tailed deer abundance appears to have peaked in the early 1990s. Between 1985 and 2007, production of cereal grains and alfalfa hay within the Selkirk Zone declined approximately 45% (Figure 2.7). This change in agricultural production, combined with periodic severe winters and prolonged summer droughts probably led to fluctuations in white-tailed deer numbers, but not their distribution.

*Between 1985 and 2007, production of cereal grains and alfalfa hay within the Selkirk Zone declined approximately 45%. This change in agricultural production, combined with periodic severe winters and prolonged summer droughts probably led to fluctuations in white-tailed deer numbers, but not their distribution.*

Figure 2.7. Acres within Ferry, Stevens, and Pend Oreille Counties in cereal grain and alfalfa hay crop production, 1985-2007 (National Agricultural Statistics Service, USDA).

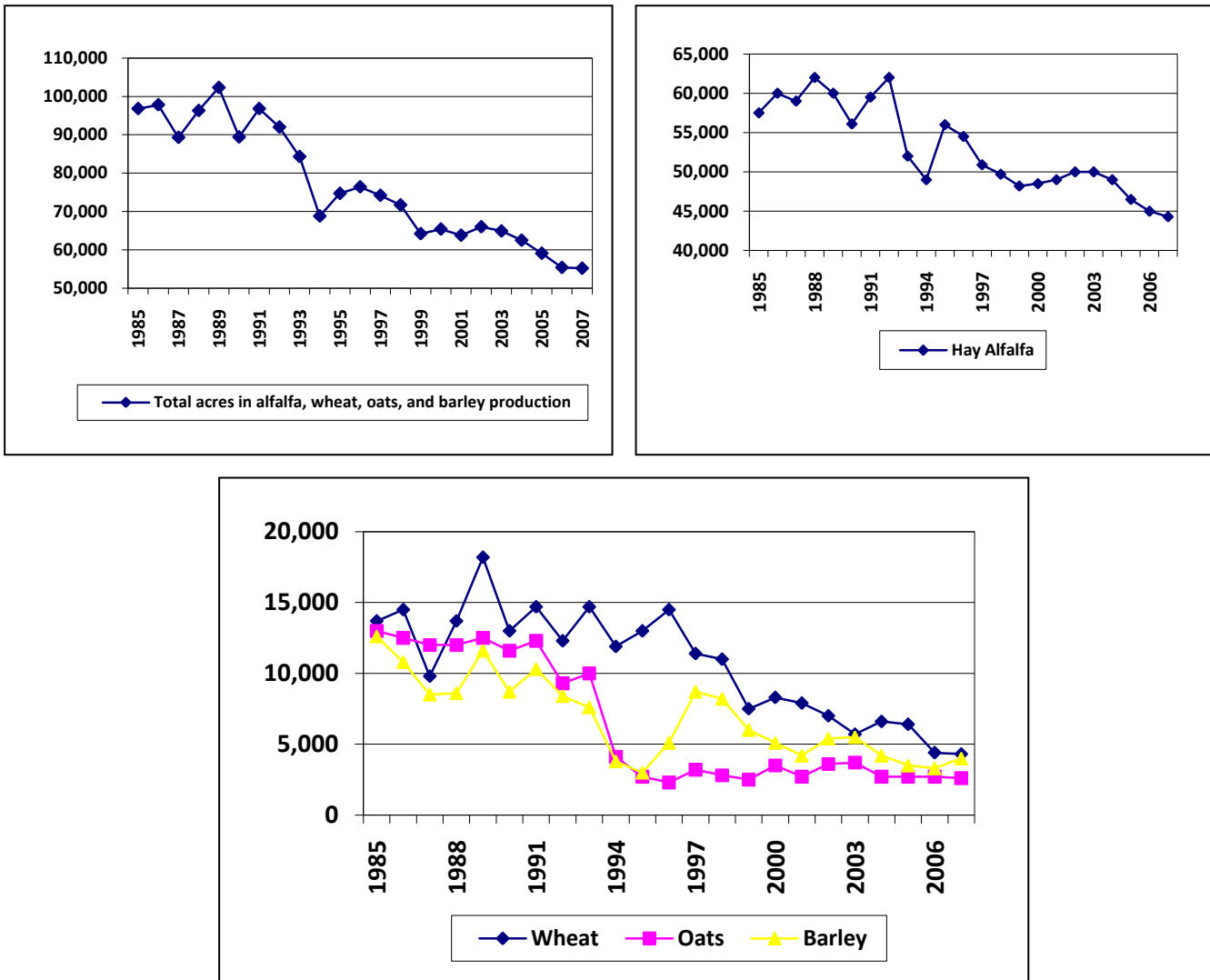
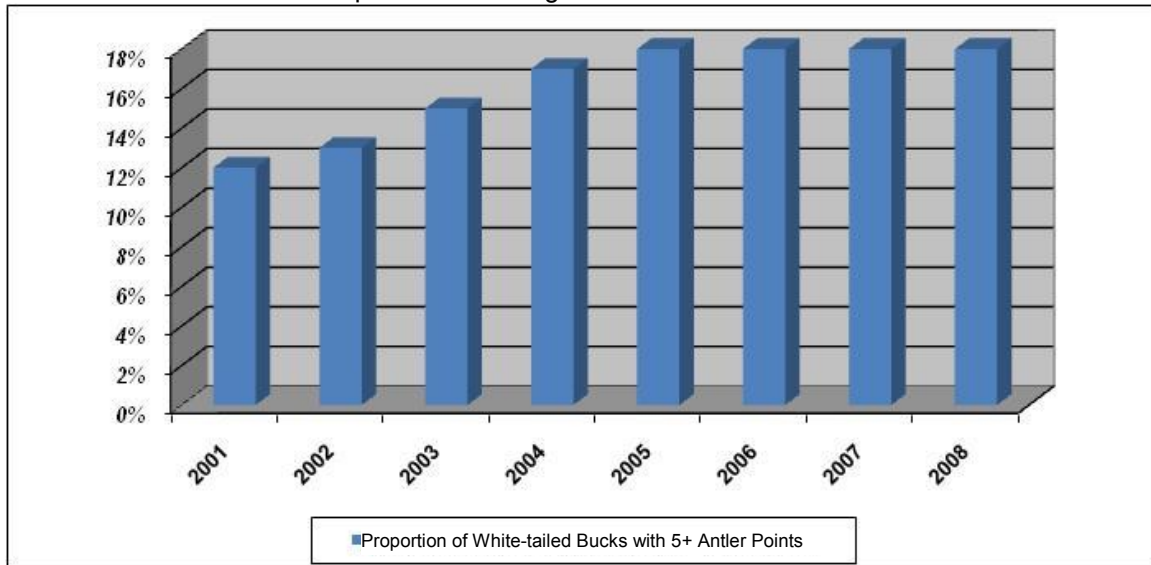


Table 2.6. Trend in hunter harvest of deer within the Selkirk Zone, 2001-2008.

<b>All Deer Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	7,284	7,140	8,216	9,432	9,455	10,402	9,773	8,331
Total Estimated White-tailed Deer Harvest	7,092	6,972	7,987	9,147	9,214	9,859	9,560	8,080
Antlered White-tailed Deer Harvested	5,081	5,164	5,695	6,652	6,649	6,508	6,328	5,635
Antlerless White-tailed Deer Harvested	2,011	1,808	2,292	2,495	2,565	3,351	3,232	2,445
Antlerless Harvest as a Percentage of Antlered Harvest	40%	35%	40%	38%	39%	51%	51%	43%
White-tailed Deer Bucks with 5 or more antler points	608	660	881	1,130	1,213	1,178	1,158	1,012
Proportion of 5+ antler point White-tailed Deer Bucks	12%	13%	15%	17%	18%	18%	18%	18%
<b>Modern Firearm Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	6,252	6,258	7,071	8,214	8,019	8,695	8,128	6,884
Total Estimated White-tailed Deer Harvest	6,070	6,105	6,855	7,936	7,806	8,223	7,943	6,649
Antlered White-tailed Deer Harvested	4,607	4,747	5,133	6,992	5,915	5,681	5,530	4,919
Antlerless White-tailed Deer Harvested	1,463	1,358	1,722	1,944	1,891	2,542	2,413	1,730
White-tailed Deer Bucks with 5 or more antler points	529	589	754	980	1,018	947	929	861
Proportion of 5+ antler point White-tailed Deer Bucks	11%	12%	15%	16%	17%	17%	17%	18%
<b>Muzzleloader Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	443	402	512	505	600	621	523	460
Total Estimated White-tailed Deer Harvest	436	396	506	500	578	600	511	446
Antlered White-tailed Deer Harvested	175	170	182	209	245	238	184	192
Antlerless White-tailed Deer Harvested	261	226	324	291	333	362	327	254
White-tailed Deer Bucks with 5 or more antler points	18	10	17	32	53	43	31	17
Proportion of 5+ antler point White-tailed Deer Bucks	10%	6%	9%	15%	22%	18%	17%	9%
<b>Archery Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	589	480	633	713	836	1,083	1,114	976
Total Estimated White-tailed Deer Harvest	586	471	626	701	830	1,033	1,098	974
Antlered White-tailed Deer Harvested	299	247	380	451	489	587	607	516
Antlerless White-tailed Deer Harvested	287	224	246	250	341	446	491	458
White-tailed Deer Bucks with 5 or more antler points	61	61	110	118	142	188	196	133
Proportion of 5+ antler point White-tailed Deer Bucks	20%	25%	29%	26%	29%	32%	32%	26%

\* Combines both white-tailed deer and mule deer

Figure 2.8. Proportion of all white-tailed deer bucks taken by hunters within the Selkirk Zone, 2001-2008 that had at least 5 points on the larger antler.



## Black Bear Management

Black bear management in the Selkirk and Okanogan White-tailed Deer Zones has been to manage for stable populations using the guidelines mentioned in the Game Management Plan 2009-2015 (WDFW 2008). Because white-tailed deer and black bears use the landscape differently and the two species are managed differently, the white-tailed deer zones do not coincide with black bear management units. The Northeastern Black Bear Management Unit most closely matches the Selkirk White-tailed Deer Zone and the Okanogan Highlands White-tailed Deer Zone combined (Table 2.7). Total black bear harvest in the past 9 years has ranged from 284 to 495 (Figure 2.9, Table 2.8) in this assemblage of GMUs. Black bear hunter numbers have been somewhat variable (Table 2.9). The general season structure for black bears in the Selkirk and Okanogan Highlands White-tailed Deer Zones has been consistent for the past 10 years. The most notable change in bear seasons has been the addition of special permit, spring, bear seasons in portions of the Selkirk Deer Zone.

Table 2.7. Game Management Units in common between the Northeastern Black Bear Management Unit and the Selkirk and Okanogan Highlands White-tailed Deer Zones.

Game Management Units that make up the Selkirk and Okanogan Highlands White-tailed Deer Zones	Game Management units that make up the Northeastern Black Bear management Unit
101	101
105	105
108	108
111	111
113	113
117	117
121	121
124	
204	204



Figure 2.9. Black bear harvest estimated for the Selkirk White-tailed Deer Zone and the Okanogan Highlands White-tailed Deer Zone combined, from 2001 to 2009.

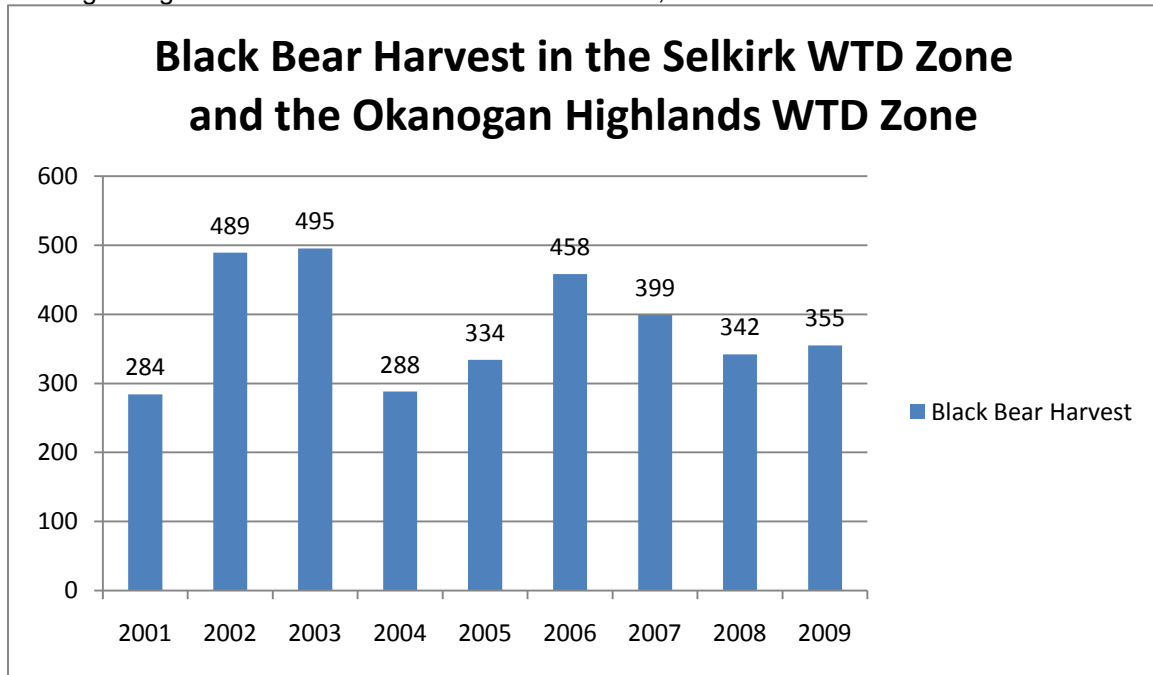


Table 2.8. Black bear harvest by GMU in the Selkirk and Okanogan Highlands White-tailed Deer Zones 2001 to 2009.

Game Management Units	Year								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
101	59	89	74	57	47	87	57	59	64
105	21	40	38	27	27	45	32	24	30
108	NA	NA	24	15	13	14	21	15	22
109	34	62	NA	NA	NA	NA	NA	NA	NA
111	NA	NA	31	16	18	44	42	24	31
113	23	49	80	23	36	66	44	36	21
117	16	68	73	27	53	64	64	42	61
121	66	98	89	52	64	80	68	76	53
124	25	33	30	24	23	23	32	21	28
204	40	50	56	47	53	35	39	45	45
<b>Total</b>	<b>284</b>	<b>489</b>	<b>495</b>	<b>288</b>	<b>334</b>	<b>458</b>	<b>399</b>	<b>342</b>	<b>355</b>

The median age for female black bears harvested from 2001 through 2008 have either been at objective or below objective for 7 out of those 8 years (Figure 2.10). Given the criteria of the guidelines, this would suggest that there may be little or no room to increase harvest of female black bears and still manage for a stable bear population. To maintain consistency with the Game Management Plan (manage for a stable bear population), if additional bear harvest pressure was implemented to benefit white-tailed deer, it could be applied to the male component of this black bear population (WDFW 2008).

Figure 2.10. Median Age of Harvested Female Black Bears in the Northeastern Black Bear Management Unit 2001 to 2008.

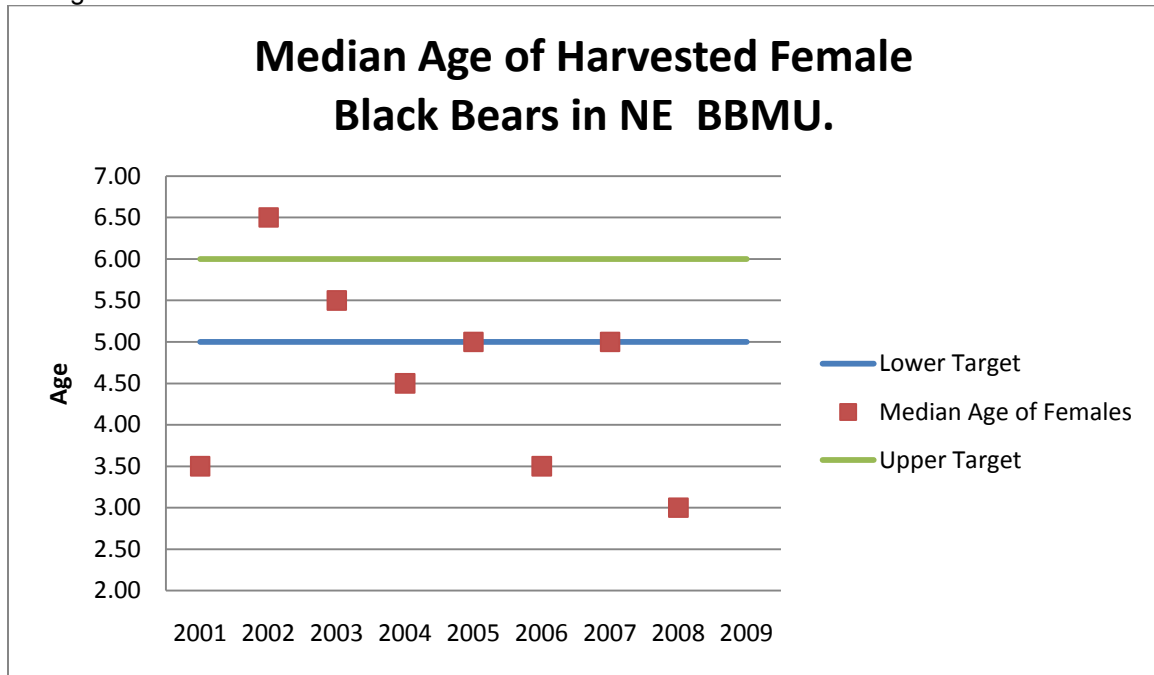


Table 2.9. Black bear hunter numbers estimated for the Selkirk White-tailed Deer Zone and the Okanogan Highlands White-tailed Deer Zone combined for 2001 to 2009.

GMU	2001	2002	2003	2004	2005	2006	2007	2008	2009
101	1,022	1,057	908	879	792	822	781	827	840
105	308	319	303	316	232	259	257	286	287
108	NA	NA	211	145	142	133	159	177	155
109	526	589	NA	NA	NA	NA	NA	NA	NA
111	NA	NA	321	276	256	296	367	293	323
113	602	639	616	535	468	508	554	625	585
117	748	768	795	682	648	698	786	822	788
121	923	1,001	893	769	780	836	819	901	739
124	570	483	439	394	385	423	428	499	522
204	581	614	609	582	524	568	639	675	610
<b>Total</b>	<b>5,280</b>	<b>5,470</b>	<b>5,095</b>	<b>4,578</b>	<b>4,227</b>	<b>4,543</b>	<b>4,790</b>	<b>5,105</b>	<b>4,849</b>

### Cougar Management

Cougar management decisions are made at the cougar management unit level. The objective for cougar management in the Selkirk White-tailed Deer Zone is to manage for a stable population at the 2007 level (WDFW 2008). If monitoring indicates that cougar numbers are higher than they were in 2007, additional cougar hunting pressure will need to be exerted to bring the population to objective.

The Selkirk White-tailed Deer Zone does not coincide well with cougar zones or cougar management units (WDFW 2008). Lethal cougar removals typically come in the form of recreational harvest, depredation removals associated with complaints made by livestock growers, and public safety removals (Table 2.10).

Table 2.10. Total cougar removals by GMU in the Selkirk White-tailed Deer Zone 2001 to 2009. Removals include hunting, depredation removals, and public safety removals.

Game Management Units	Year								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
105	6	5	3	4	10	6	6	2	1
108	NA	NA	8	7	2	1	9	2	1
109	21	9	NA	NA	NA	NA	NA	NA	NA
111	NA	NA	5	7	4	3	2	3	4
113	15	7	1	5	10	2	6	7	3
117	13	9	20	5	6	9	5	6	1
121	12	8	8	5	5	4	9	1	1
124	11	11	9	3	6	6	6	5	5
<b>Total</b>	<b>78</b>	<b>49</b>	<b>54</b>	<b>36</b>	<b>43</b>	<b>31</b>	<b>43</b>	<b>26</b>	<b>16</b>

In 1996, Voter Initiative 655 significantly altered cougar harvest and impacts to cougar seasons. Initiative 655 (I-655) banned the use of dogs for hunting cougar. To maintain cougar harvest, the Fish and Wildlife Commission increased cougar season length from about 3 to 7 ½ months, permit-only seasons were replaced with general seasons, the bag limit increased from 1 to 2 cougar per year, and the cost of a cougar transport tag decreased from \$24 to about \$10. Collectively, these changes resulted in statewide cougar harvest levels higher than harvest levels prior to I-655 (pre I-655 = 156 kills/year; post I-655 = 195 kills/year). Cougar harvest increased annually to the all-time high in 2001, at which time some regional cougar populations likely declined due to high harvest (Lambert et al. 2006).

In the Selkirk and Okanogan Highlands White-tailed Deer Zones, WDFW adopted the objective to continue managing for reduced cougar levels between 2004 and 2007. In the 2009-2015 Game Management Plan, the cougar population objective was updated to manage for stable cougar populations in these white-tailed deer zones, but at the reduced 2007 population level (WDFW 2008). Harvest levels since 2008 are aimed to achieving that objective.

## 2.2 Palouse Zone

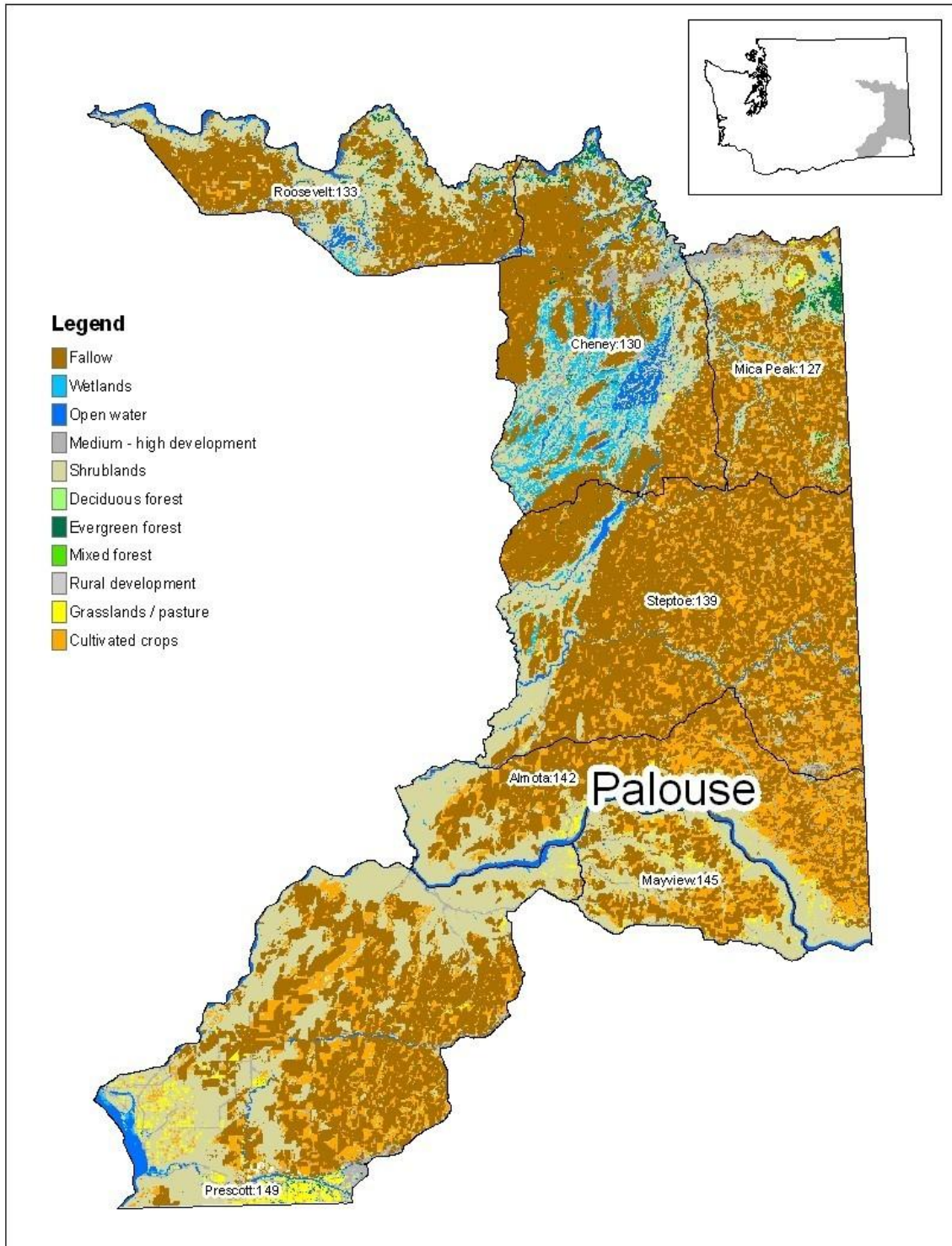


Figure 2.11. Palouse White-tailed Deer Management Zone.

## Population Goal

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The white-tailed deer population in the Palouse Zone is at an acceptable level. Hunting season structure is designed to maintain the population at its current level or allow a slight increase as long as agricultural damage does not become a problem.

### *Palouse Zone Population Goal – Maintain*

#### **Strategy:**

- Recommend hunting season structures and opportunity that will maintain white-tailed deer at their current numbers and distribution, while still attempting to maintain some opportunity for all user groups.

Reliable estimates of the white-tailed deer population cannot be achieved with accuracy due to the nature of the current data collected (composition ratios), as well as staffing and budgetary limitations. A conservative rough estimate, based on 6-8 deer per square mile of habitat and assuming that 75% of the Palouse Zone is white-tailed deer habitat, would be 13,000 – 25,000 white-tailed deer in the Palouse Zone. This number varies greatly depending on harvest, winter severity, cover habitat, native habitat condition, and farming practices.

Management decisions are based on hunter report data, pre-season composition surveys, and limited post-season composition surveys. Harvest in conjunction with success rate (total harvest/number of hunters) and days/kill are used to assess population trends while taking into account hunter effort and numbers.

The quality of the bucks harvested is monitored by the trend in the percentage of 5 point or large bucks in the harvest. Pre-season, composition surveys are used to assess recruitment and population trend. Post season composition, when collected, is used to assess buck escapement (buck:100 doe ratio). However, post season surveys are conducted sporadically and usually in a limited area because of budget and workforce limits. Ground surveys of white-tailed deer post hunting have been found to be inefficient and highly biased due to road avoidance and nocturnal nature exhibited by white-tailed bucks. Helicopter surveys appear to be the most efficient survey technique attempted to date for the post season, and are used on a limited basis when funding allows.

Agricultural damage, damage to private property, and vehicular collisions are a concern in most of the Palouse Zone. Doe harvest by archers, muzzleloaders, senior, youth, or disabled is allowed in some form in most of the GMUs composing the Palouse Zone. Additionally ~ 600 second tag permits are issued each year, along with damage tags issued by WDFW enforcement in “hot spots”, to help maintain this population within landowner tolerances.

## Management Direction for White-tailed Deer in the Palouse Zone

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Management emphasis is to retain hunter numbers and hunter recreation days, while maintaining white-tailed deer populations that support hunting recreation and hunter satisfaction while concurrently minimizing agricultural and residential damage complaints. In areas with high damage complaints, management actions will be taken to maintain adequate harvest pressure on antlerless white-tailed deer.

## Description

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The Palouse White-tailed Deer Management Zone is 5,866 square miles and includes Game Management Units (GMUs) 127, 130, 133, 139, 142, 145, and 149 (Figure 2.11). This zone is predominantly privately owned (94% of the land base) and approximately 60% of the landscape is in agriculture, 30% in shrub or grass steppe, and 10% in other cover classes (Figure 2.12 and 2.13; Tables 2.11 and 2.12). Road density for the zone averages 2.1 miles per square mile.

Current hunting seasons for white-tailed deer consist of a nine day general modern firearm season throughout this zone, with an additional 17 day late season permit hunt in GMUs 127-142 and a seven day late season hunt for Master Hunters in GMUs 130-142 (antlerless harvest only). The modern firearm general season is a buck-only season with a three-point minimum, unless the hunter is a senior (over age 65), disabled, or youth (under age 16), in which case an antlerless white-tailed deer may be taken. There is currently a 30 day early archery season throughout the zone, with an additional 26, 19, and 11 days offered as a late archery season in GMUs 127, 145, and 133, respectively. There is currently a seven day early muzzleloader season in GMUs 133, 142, 145, and 149, with an additional 11 days during the late muzzleloader season in GMUs 130 and 139. Archery and muzzleloader hunters are allowed to take either a buck (three-point minimum) or an antlerless deer. Additional antlerless white-tailed deer special permits are allocated annually by lottery, with numbers dependent on local population status and the level of agricultural and residential damage complaints in an area.

The Confederated Tribes of Umatilla Indians in Oregon have an off-reservation treaty hunting right within the southwestern portion of the Palouse Zone. The Nez Perce Tribe in Idaho has an off-reservation treaty hunting right within the southeastern portion of this Zone. Both tribes can promulgate hunting regulations for their members to hunt white-tailed deer on “open and unclaimed lands” within their ceded area.

Table 2.13 presents a summary of recent deer harvests within the Palouse Zone. From 2001 through 2008, the annual average hunter harvest of white-tailed deer was 2,497 and the average number of antlered white-tail bucks taken annually was 1,739. Appendix B.1 summarizes deer hunter densities and harvest success rates, by hunting method, on an individual GMU basis. Deer hunter densities have ranged from less than one to nearly six hunters per square mile within each of the seven GMUs comprising the Palouse Zone, depending upon the year and hunting method. Typically, hunter densities are substantially lower for archery and muzzleloader seasons than for modern firearm seasons. Hunter densities also tend to be lower in GMUs that are predominately private land. Harvest success generally equates to one in three hunters taking a deer each year, depending upon the GMU and hunting method: archery, muzzleloader, or modern firearm (Appendix B.2). Hunter harvest of mature white-tailed bucks with five or more antler points on the larger antler averaged 26% from 2001–2008 (Figure 2.14).

Figure 2.12. Major categories of landowners within the Palouse Zone.

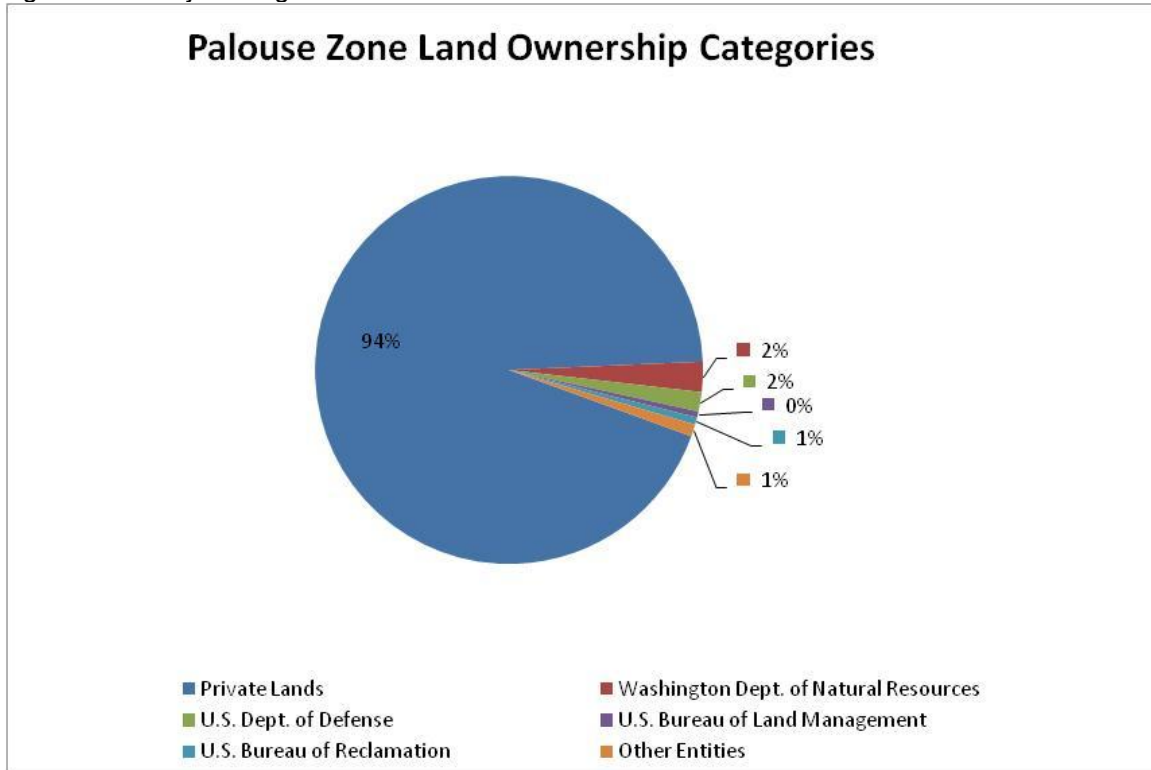


Table 2.11. Major landowner categories within the Palouse Zone.

Landowner Category	Acres	Percentage
Private Lands	3,517,878	93.7%
Washington Department of Natural Resources	93,404	2.5%
U.S. Department of Defense	59,487	1.6%
U.S. Bureau of Reclamation	21,365	0.6%
U.S. Bureau of Land Management	20,216	0.5%
U.S. Fish and Wildlife Service	16,455	0.4%
County Government	7,028	0.2%
Washington Department of Parks and Recreation	6,297	0.2%
Washington State University	5,766	0.2%
Washington Department of Fish and Wildlife	2,671	0.1%
Washington State (other)	1,609	< 0.1%
Municipal Government	1,417	< 0.1%
Washington Department of Corrections	674	< 0.1%
U.S. National Park Service	106	< 0.1%
Spokane Indian Reservation	54	< 0.1%
<b>Total Acreage of Zone</b>	<b>3,754,427</b>	<b>100%</b>

Figure 2.13. Major categories of land cover within the Palouse Zone.

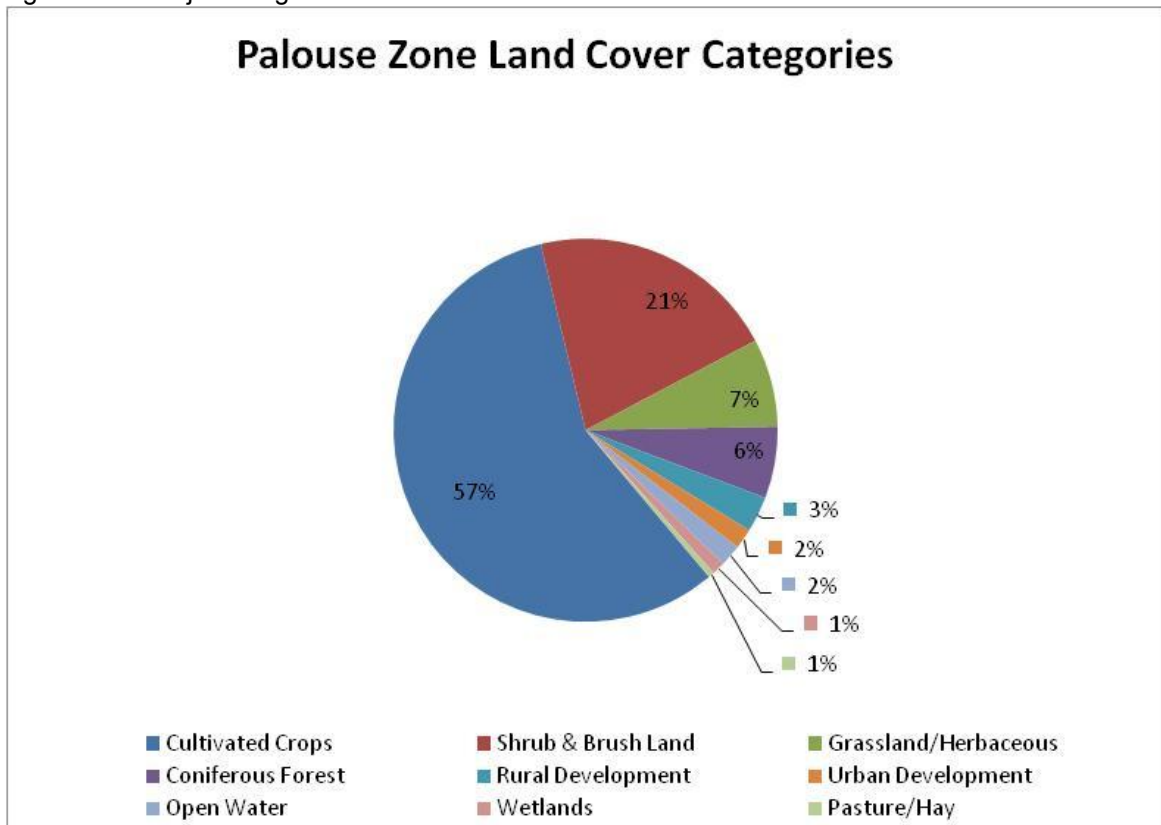


Table 2.12. Major land cover categories within the Palouse Zone.

Land Cover Category	Acres	Percentage
Cultivated Crops	2,160,746	57.6%
Shrub & Brush Land	782,850	20.9%
Grassland/Herbaceous	278,035	7.4%
Coniferous Forest	226,295	6.0%
Rural Development	111,469	3.0%
Open Water	66,817	1.8%
Urban Development	65,346	1.7%
Wetlands	41,945	1.1%
Pasture/Hay	16,907	0.5%
Broad-leaf and Mixed Forest	3,360	< 0.1%
Other	657	< 0.1%
<b>Total Acreage of Zone</b>	<b>3,754,427</b>	<b>100%</b>



## Historical Perspective

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Prior to agricultural development of the Palouse, white-tailed deer were believed to be scarce and appeared to have been restricted to higher elevation woodlands and riparian corridors, with mule deer occupying the lower elevation shrub/grassland steppe. As agricultural development increased in the steppe, white-tailed deer expanded their range and densities increased in the lower elevations. In GMUs 127 and 139 the annual hunter harvest in the 1970s averaged 79 white-tailed deer and 336 mule deer. From 2001-2006 the average annual harvest for these GMUs was 604 white-tailed deer and 882 mule deer. Currently, white-tailed deer are predominantly found in the eastern portion of the zone near farm homesteads with abundant windbreak plantings, along riparian areas, and associated breaks of the Palouse, Spokane, Snake, and Columbia Rivers. Hunter harvest of mature white-tailed bucks (5+ points) averaged about 26% of the antlered white-tailed deer harvest over the last eight years (Figure 2.14). Pre-season composition surveys (Table 2.14) are used to assess recruitment and population trend. Post season composition (Table 2.14), when collected, is used to assess buck escapement (buck:100 doe ratio). Prior to the 2006 harvest, success and days/kill were relatively stable. In 2006 there was a dip in both harvest and success which was probably due to the implementation of a permit only late modern firearm season in GMUs 127-142 (Figure 2.15). Since 2006 there has been a steady increase in all three measures.

Table 2.13. Trend in hunter harvest of deer within the Palouse Zone, 2001-2008.

<b>All Deer Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	5,268	5,719	5,974	5,304	5,150	4,169	4,185	4,822
Total Estimated White-tailed Deer Harvest	2,462	2,520	2,739	2,521	2,811	2,115	2,282	2,527
Antlered White-tailed Deer Harvested	1,741	1,887	1,801	1,722	2,019	1,341	1,581	1,823
Antlerless White-tailed Deer Harvested	720	633	938	795	790	771	695	704
Antlerless Harvest as a Percentage of Antlered Harvest	41%	34%	52%	46%	39%	57%	44%	39%
White-tailed Deer Bucks with 5 or more antler points	395	417	467	450	514	364	443	491
Proportion of 5+ antler point White-tailed Deer Bucks	23%	22%	26%	26%	25%	27%	28%	27%
<b>Modern Firearm Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	4,695	5,116	5,198	4,486	4,305	3,357	3,383	3,834
Total Estimated White-tailed Deer Harvest	2,152	2,240	2,345	2,148	2,397	1,643	1,781	1,923
Antlered White-tailed Deer Harvested	1,556	1,726	1,606	1,521	1,775	1,048	1,238	1,433
Antlerless White-tailed Deer Harvested	596	514	739	627	622	595	543	490
White-tailed Deer Bucks with 5 or more antler points	325	350	390	383	426	245	326	357
Proportion of 5+ antler point White-tailed Deer Bucks	21%	20%	24%	25%	24%	23%	26%	25%
<b>Muzzleloader Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	351	372	525	561	528	420	374	534
Total Estimated White-tailed Deer Harvest	158	140	220	228	214	219	210	296
Antlered White-tailed Deer Harvested	87	85	84	108	107	133	127	185
Antlerless White-tailed Deer Harvested	71	55	136	120	107	86	83	111
White-tailed Deer Bucks with 5 or more antler points	34	39	33	22	39	57	38	62
Proportion of 5+ antler point White-tailed Deer Bucks	39%	46%	39%	20%	36%	43%	30%	34%
<b>Archery Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	222	231	251	257	317	389	422	446
Total Estimated White-tailed Deer Harvest	152	140	174	145	200	250	287	302
Antlered White-tailed Deer Harvested	98	76	111	93	137	157	212	202
Antlerless White-tailed Deer Harvested	53	64	63	48	61	90	69	100
White-tailed Deer Bucks with 5 or more antler points	36	28	44	45	49	61	78	69
Proportion of 5+ antler point White-tailed Deer Bucks	37%	37%	40%	48%	36%	39%	37%	34%

\* Combines both white-tailed deer and mule deer

Figure 2.14. Proportion of all white-tailed deer bucks taken by hunters within the Palouse Zone, 2001-2008 that had at least 5 points on the larger antler.

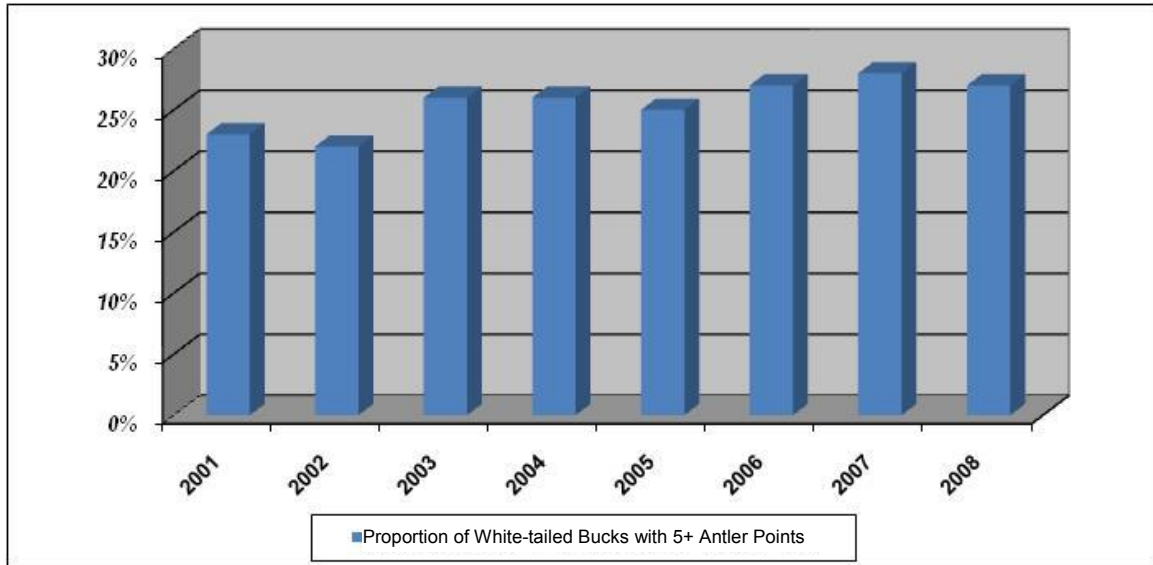


Figure 2.15. Hunter success rate and days per kill within the Palouse Zone for both white-tailed and mule deer. Success rate was defined as total harvest divided by number of hunters. Both species are included in these metrics because current data collection methods do not allow separation of the species. (Data from GMUs 127-142 only).

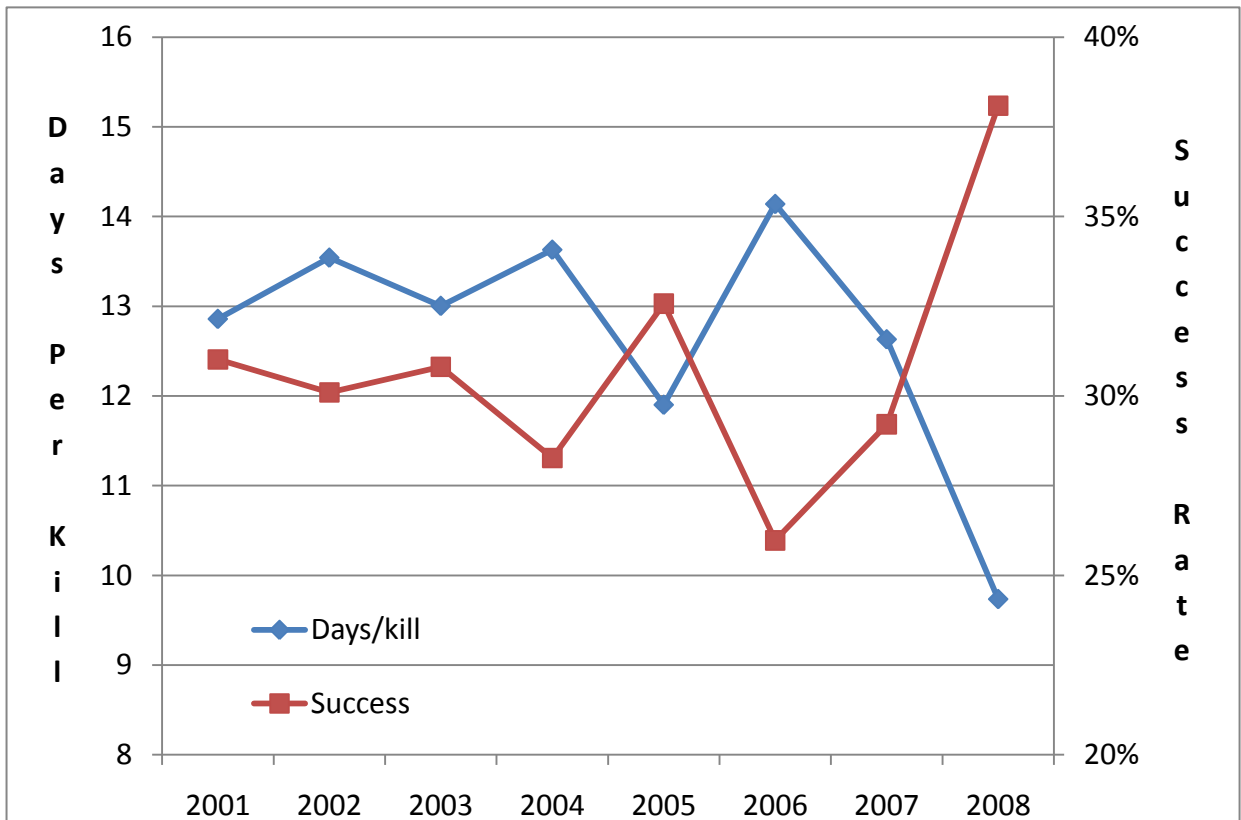


Table 2.14. White-tailed deer sex and age composition ratios (GMUs 127-142 only).

Species	Year	(Buck : Doe : Fawn)	
		Pre-season	Post-season
White-tailed Deer	2002	24:100:50	*
	2003	36:100:87	*
	2004	23:100:82	*
	2005	33:100:43	*
	2006	20:100:61	8:100:65
	2007	30:100:64	10:100:44 <sup>1</sup>
	2008	29:100:62	36:100:48 <sup>2</sup>

\* No post-season surveys.

<sup>1</sup> Based on one flight in GMU 142

<sup>2</sup> Based on one flight in GMU 142 and one in GMU 133

## Black Bear Management

Black bear management in the Palouse White-tailed Deer Zones has been to manage for stable populations using the guidelines in the Game Management Plan 2009-2015 (WDFW 2008). White-tailed deer and black bears are managed differently, and the white-tailed deer zones do not coincide with black bear management units. The Northeastern “B” Black Bear Management Unit most closely matches a portion of the Palouse White-tailed Deer Zone but the black bear management is only 3 GMUs whereas the white-tailed deer zone is 7 (Table 2.15). The overlap is in GMUs 127 and 130. Total black bear harvest in the past 9 years has been low in this assemblage of GMUs ranging from 7 to 19 (Figure 2.16, Table 2.16). Hunter numbers are relatively low in this white-tailed deer zone (Tables 2.17). The preponderance of agricultural land in the Palouse Zone makes for poor black bear habitat, and bear densities are suspected to be quite low. The general season structure for black bears in the Palouse White-tailed Deer Zones has been consistent for the past 10 years.

Table 2.15. Game Management Units in common between the Northeastern Black Bear Management Unit and the Palouse White-tailed Deer Zone.

Game Management Units that make up the Palouse White-tailed Deer Zone	Game Management Units that make up the Northeastern "B" Black Bear management Unit
	124
127	127
130	130
133	
139	
142	
145	
149	

Figure 2.16. Black bear harvest estimated for the Palouse White-tailed Deer Zone from 2001 to 2009.

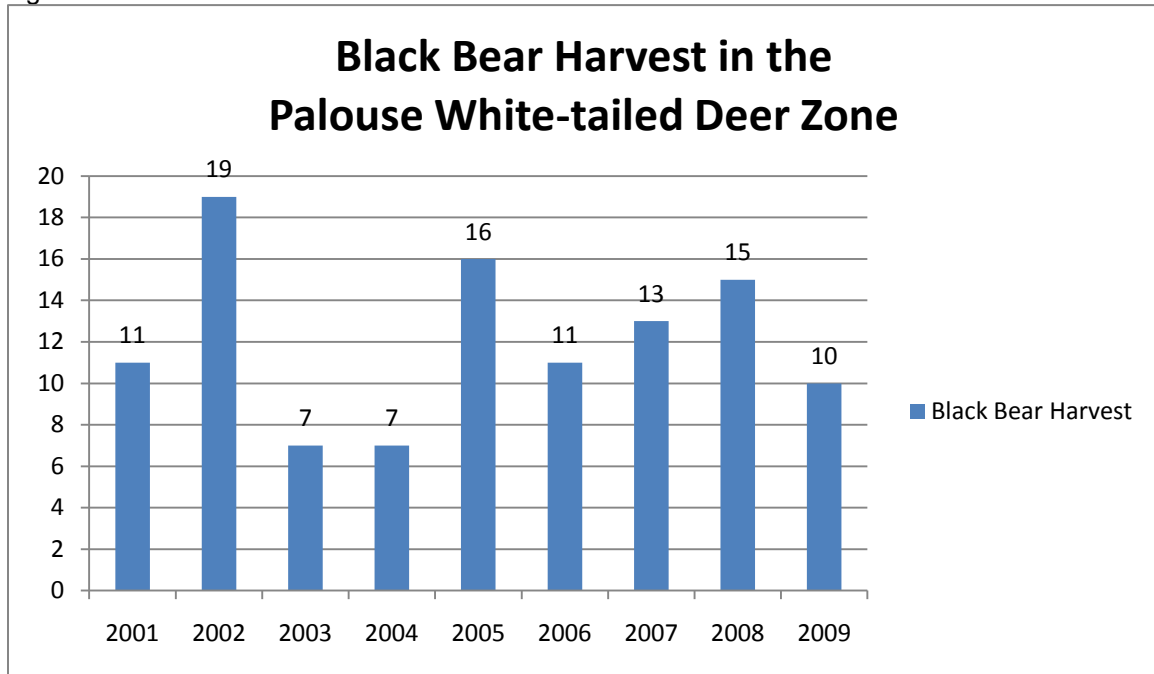


Table 2.16. Black bear harvest by GMU in the Palouse White-tailed Deer Zone 2001 to 2009.

Game Management Units	Year									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	
127	6	9	3	4	3	5	8	5	4	
130	1	3	0	0	2	1	0	0	0	
133	1	6	2	2	8	3	3	9	3	
139	0	1	1	0	0	1	0	0	0	
142	1	0	1	0	1	0	2	0	0	
145	0	0	0	0	0	0	0	1	0	
149	2	0	0	1	2	1	0	0	3	
<b>Total</b>	<b>11</b>	<b>19</b>	<b>7</b>	<b>7</b>	<b>16</b>	<b>11</b>	<b>13</b>	<b>15</b>	<b>10</b>	

For analysis purposes, the median age for female black bears harvested from 2001 through 2008 is calculated using combined data from the Northeastern “A” and Northeastern “B” Black Bear Management Units. The median age for female black bears harvested from 2001 through 2008 have either been at objective or below objective for 7 out of those 8 years. Given the criteria of the guidelines in the Game Management Plan (WDFW 2008), this would suggest that there may be little room to increase harvest of female black bears and still manage for a stable bear population. If warranted, additional harvest pressure would have to be applied to the male component of this black bear population. See the black bear management section of the Selkirk Zone for median ages of harvested bears.

Table 2.17. Black bear hunter numbers estimated for the Palouse White-tailed Deer Zone for 2001 to 2009.

<b>GMUs</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
<b>127</b>	127	131	109	87	67	90	77	86	59
<b>130</b>	18	39	20	19	21	12	21	10	11
<b>133</b>	108	97	110	116	111	105	88	133	117
<b>139</b>	13	16	15	12	13	6	5	16	12
<b>142</b>	31	20	18	12	13	17	11	7	9
<b>145</b>	33	18	17	12	3	13	5	13	15
<b>149</b>	31	24	29	26	28	18	23	15	25
<b>Total</b>	<b>361</b>	<b>345</b>	<b>318</b>	<b>284</b>	<b>256</b>	<b>261</b>	<b>230</b>	<b>280</b>	<b>248</b>

## Cougar Management

Cougar management decisions are made at the cougar management unit level. The objective for cougar management in the Palouse White-tailed Deer Zone is to manage for a stable population except in GMUs 139 and 142 that occur in an area that is considered unsustainable for cougar. The Palouse White-tailed Deer Zone does not coincide well with cougar zones or cougar management units (WDFW 2008). Lethal cougar removals typically come in the form of recreational harvest, depredation removals associated with complaints made by livestock growers, and public safety removals (Table 2.18).

Table 2.18. Total cougar removals by GMU in the Palouse White-tailed Deer Zone 2001 to 2009. Removals include hunting, depredation removals, and public safety removals.

<b>Game Management Units</b>	<b>Year</b>								
	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
<b>127</b>	2	0	0	2	0	1	0	0	0
<b>130</b>	2	0	0	0	0	1	0	0	0
<b>133</b>	2	4	1	7	7	4	2	4	6
<b>139</b>	0	0	0	0	0	0	0	0	0
<b>142</b>	0	0	0	0	0	0	0	0	0
<b>145</b>	0	1	0	0	0	0	0	0	0
<b>149</b>	0	0	0	0	6	0	0	1	0
<b>Total</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>9</b>	<b>13</b>	<b>6</b>	<b>2</b>	<b>5</b>	<b>6</b>

## 2.3 Blue Mountains Zone

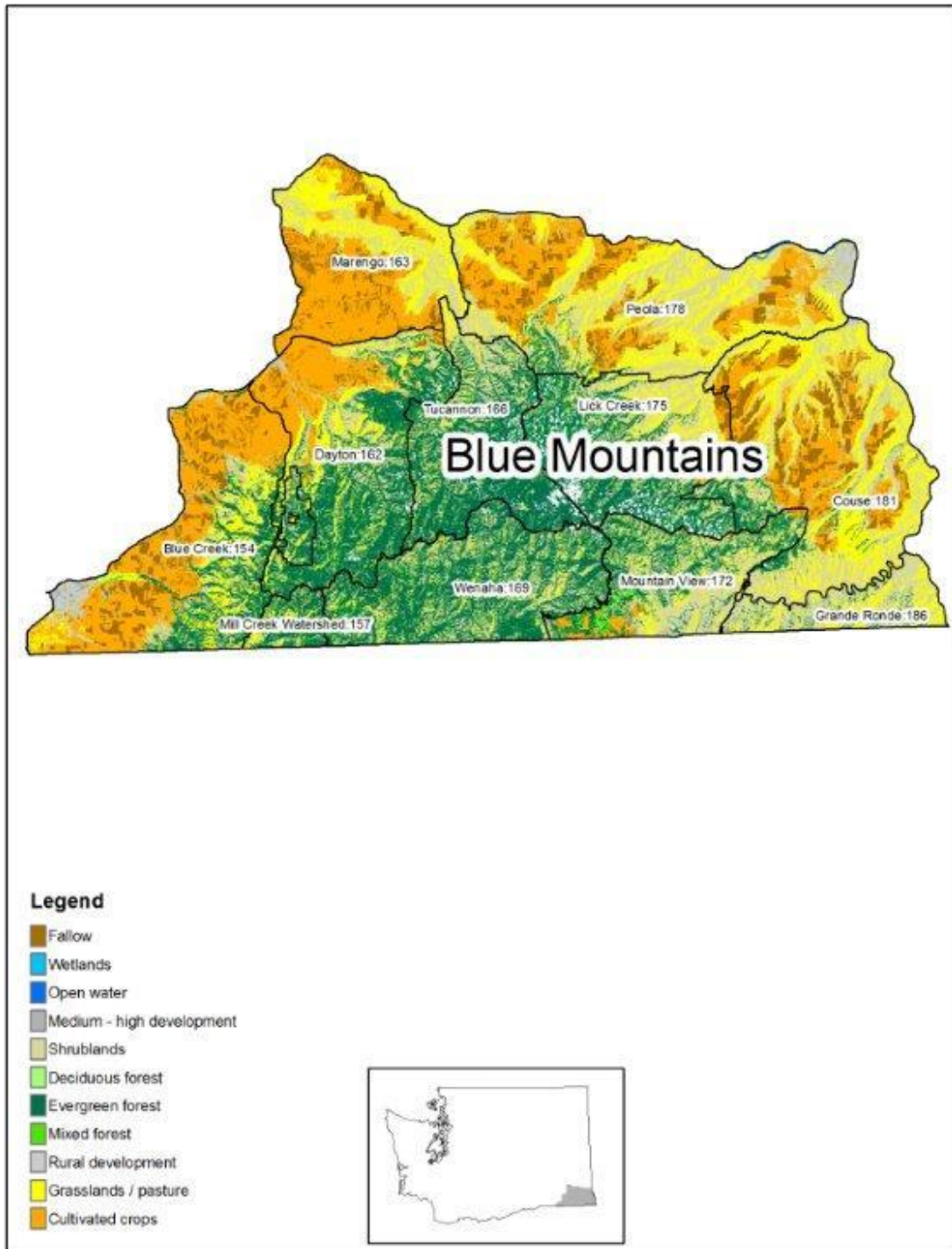


Figure 2.17. Blue Mountains White-tailed Deer Management Zone.

## Population Goal

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Currently, the white-tailed deer population in the Blue Mountains Zone is at an acceptable level. The hunting seasons are designed to maintain the population at its current level or allow a slight increase as long as agricultural damage does not become a problem.

### *Blue Mountains Zone Population Goal – Maintain*

#### Strategy:

- Recommend hunting season structures and opportunity that will maintain white-tailed deer at their current numbers and distribution, while still attempting to maintain some opportunity for all user groups.

Reliable estimates of the white-tailed deer population cannot be achieved with accuracy due to current data limitations. Survey data is limited due to the difficulty of counting white-tailed deer in large enough numbers to be statistically significant, and due to staffing and budgetary constraints. White-tailed deer are counted during mule deer surveys (December), but few white-tailed deer are counted. Periodically, if weather conditions permit (snow), ground surveys specifically targeting white-tailed deer in high density areas may be conducted to evaluate general trends in deer numbers. Management decisions are made using several data sources. The buck harvest trend and fawn: doe ratios are used to evaluate population trend. If the buck harvest is stable or increasing, and the fawn:doe ratio is increasing, the antlerless harvest may be increased to stabilize or reduce white-tailed deer numbers in specific units. If agricultural damage is becoming an issue, the antlerless harvest rate may be increased in those areas to address this problem. The quality of the bucks harvested is monitored by the trend in the percentage of 5 point or large bucks in the harvest.

## Management Direction for White-tailed Deer in the Blue Mountains Zone

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The white-tailed deer population has declined slightly over the last few years. The buck harvest averaged 45% white-tailed and 55% mule deer since 2000. Management emphasis will be to maintain the white-tailed deer population at a level that supports hunting recreation and hunter satisfaction near recent levels. Post-hunt sex ratios will be managed for a standard minimum of 15 to 19 bucks per 100 does. Additionally, management actions designed to maintain adequate harvest pressure on antlerless white-tailed deer is a priority where deer damage is an issue. Should white-tailed deer populations begin to decline; the antlerless harvest will be reduced in an attempt to stabilize the population at the desired level.

## Description

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The Blue Mountains White-tailed Deer Management Zone includes Game Management Units (GMUs) 154, 157, 162, 163, 166, 169, 172, 175, 178, 181, and 186 (Figure 2.17). The Blue Mountains Zone is 1,739 square miles comprised of approximately 37% public land and 63% private (Figure 2.18 and Table 2.19). Major habitat types include rolling dryland agricultural fields (predominantly grain production), bunchgrass canyons, shrubby draws, and forests that transition from mostly ponderosa pine into mostly subalpine fir (Figure 2.19 and Table 2.20). White-tailed



deer predominantly inhabit the lower elevations, but expansion into high elevation habitats has occurred over the last 20 years. Road density for the zone averages 1.9 miles per square mile.

Current hunting seasons for white-tailed deer consist of a nine day general modern firearm season, seven day general muzzleloader season, 18 day late muzzleloader season (GMUs 172, 181), and 48 day archery seasons (30 day early/18 day late). Permit controlled hunts that provide excellent opportunities to harvest a mature white-tailed buck are offered to modern firearm and muzzleloader hunters. All bucks harvested must have a minimum of three antler points on at least one side. Additional antlerless permits are issued, depending upon population status and the level of agricultural damage complaints.

The Confederated Tribes of Umatilla Indians in Oregon have an off-reservation treaty hunting right within the western portion of this Zone. The Nez Perce Tribe in Idaho has an off-reservation treaty hunting right within the eastern portion of this Zone. Both tribes can promulgate hunting regulations for their members to hunt white-tailed deer on “open and unclaimed land” within their ceded area.

Table 2.21 presents a summary of recent deer harvests within the Blue Mountains Zone. From 2001 through 2008, the annual average hunter harvest of white-tailed deer was 1,012. The average number of antlered white-tail bucks taken annually was 583. Appendix B.3 summarizes deer hunter densities and harvest success rates, by hunting method, on an individual GMU basis. Deer hunter densities have ranged from less than one to a little over ten hunters per square mile within each of the 11 GMUs comprising the Blue Mountains, depending upon the year and hunting method. Typically, hunter densities are substantially lower during archery and muzzleloader seasons than during modern firearm seasons. Hunter densities also tend to be lower in GMUs that are predominately private land. Generally speaking, one in three hunters will harvest a deer each year, depending upon the GMU and hunting method - archery, muzzleloader, or modern firearm (Appendix B.3). Hunter harvest of mature white-tailed bucks with five or more antler points on the larger antler averaged 20% from 2001–2008 (Figure 2.20).

Figure 2.18. Major categories of landowners within the Blue Mountains Zone.

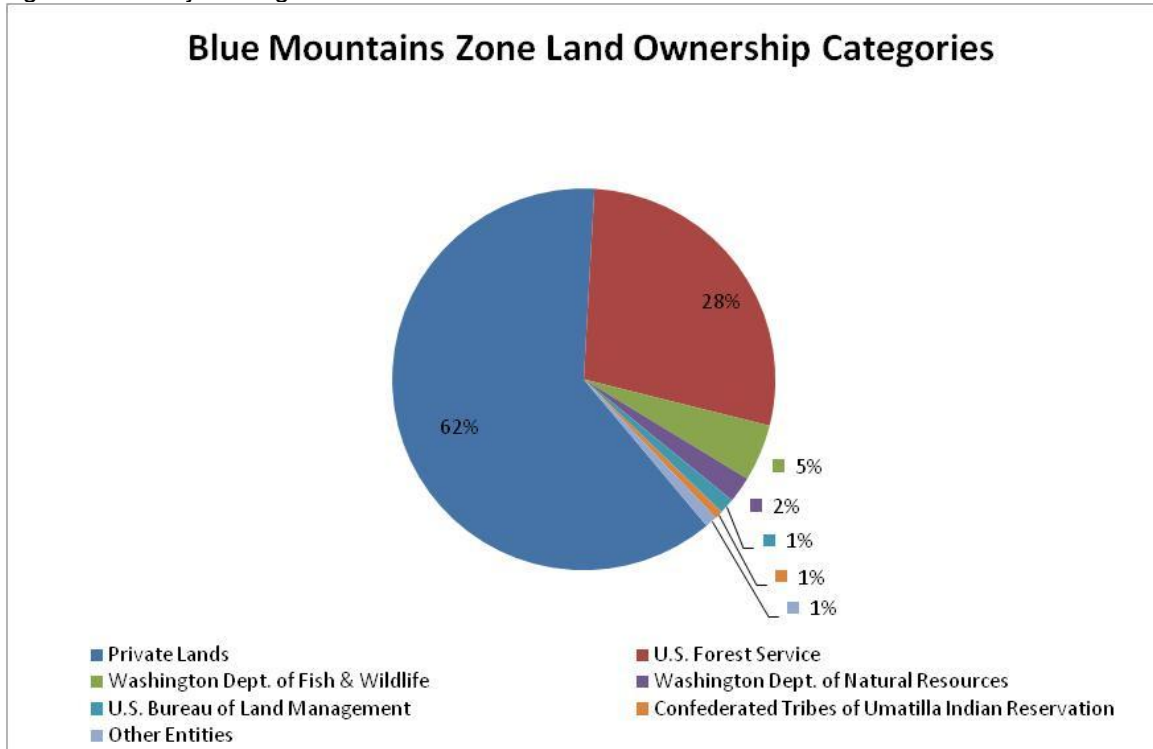


Table 2.19. Major landowner categories within the Blue Mountains Zone.

Landowner Category	Acres	Percentage
Private Lands	692,269	62.6%
U.S. Forest Service	309,393	28.0%
Washington Department of Fish & Wildlife	52,584	4.8%
Washington Department of Natural Resources	25,296	2.2%
U.S. Bureau of Land Management	14,225	1.3%
Confederated Tribes of Umatilla Indian Reservation	8,416	0.7%
U.S. Department of Defense	2,539	0.2%
Municipal Government	889	0.1%
Washington Department of Parks & Recreation	847	0.1%
<b>Total Acreage of Zone</b>	<b>1,106,458</b>	<b>100%</b>

Figure 2.19. Major categories of land cover within the Blue Mountains Zone.

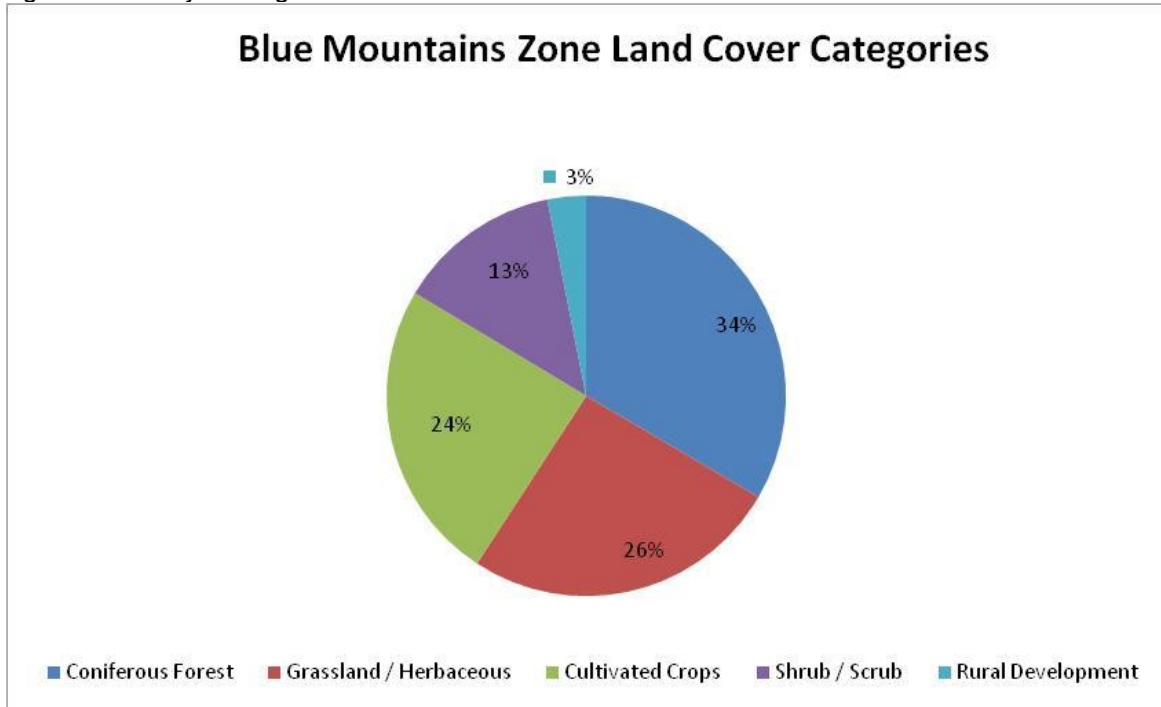


Table 2.20. Major land cover categories within the Blue Mountains Zone.

Land Cover Category	Acres	Percentage
Coniferous Forest	367,168	33.2%
Grassland/herbaceous	282,841	25.6%
Cultivated Crops	268,065	24.2%
Shrub/Scrub	145,892	13.2%
Rural Development	34,839	3.1%
Wetlands	2,751	0.2%
Open Water	2,477	0.2%
Urban Development	2,076	0.2%
Deciduous Forest	349	< 0.1%
<b>Total Acreage of Zone</b>	<b>1,106,458</b>	<b>100%</b>

### Historical Perspective

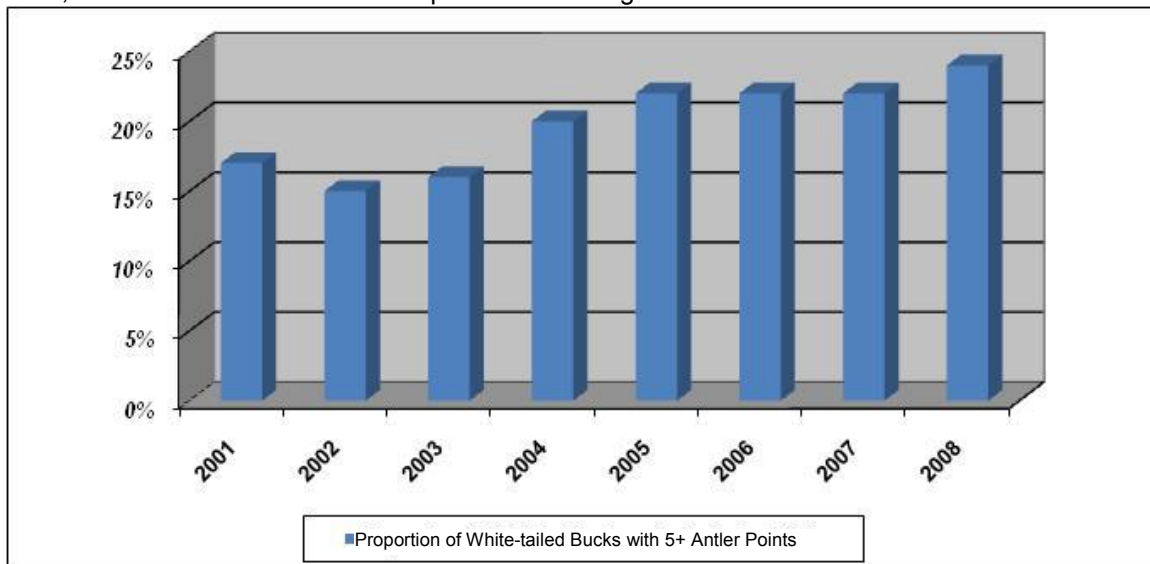
White-tailed deer have likely been part of the wildlife fauna in southeast Washington for a long time (Livingston 1987). Prior to 1980, mule deer dominated the landscape in the Blue Mountains, with the exception of a few localized areas in the foothills. White-tailed deer populations were normally found along river drainages in the farmlands and in the foothills. Few white-tails were observed at elevations above 4,500 feet. Over the last 20 years, white-tailed deer have expanded in distribution and number, now inhabiting most of the Blue Mountains Zone, including higher elevations in the mountains and the Wenaha-Tucannon Wilderness. During this period, mule deer numbers declined slightly, while the white-tailed deer population increased to a point where the white-tailed buck harvest now equals or exceeds the mule deer buck harvest in five of ten GMUs in the Blue Mountains Zone. This recent expansion of white-tailed deer in distribution and abundance is most likely due to favorable habitat changes, including the widespread enrollment of farm lands into the federal Conservation Reserve Program (CRP).

Table 2.21. Trend in hunter harvest of deer within the Blue Mountains Zone, 2001-2008.

<b>All Deer Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<i>Total Estimated Deer Harvest *</i>	1,882	2,039	2,042	2,060	1,845	1,721	1,582	1,645
Total Estimated White-tailed Deer Harvest	946	1,020	1,100	1,166	1,047	996	904	913
Antlered White-tailed Deer Harvested	570	620	584	596	573	573	552	599
Antlerless White-tailed Deer Harvested	374	399	516	547	473	423	351	305
Antlerless Harvest as a Percentage of Antlered Harvest	66%	64%	88%	92%	83%	74%	64%	51%
White-tailed Deer Bucks with 5 or more antler points	98	95	95	118	124	125	124	144
Proportion of 5+ antler point White-tailed Deer Bucks	17%	15%	16%	20%	22%	22%	22%	24%
<b>Modern Firearm Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<i>Total Estimated Deer Harvest *</i>	1,637	1,773	1,767	1,763	1,566	1,463	1,317	1,355
Total Estimated White-tailed Deer Harvest	777	858	939	977	881	829	741	731
Antlered White-tailed Deer Harvested	494	554	507	529	493	501	484	488
Antlerless White-tailed Deer Harvested	283	304	432	445	388	328	257	243
White-tailed Deer Bucks with 5 or more antler points	77	91	78	104	105	107	108	117
Proportion of 5+ antler point White-tailed Deer Bucks	16%	16%	15%	20%	21%	21%	22%	24%
<b>Muzzleloader Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<i>Total Estimated Deer Harvest *</i>	91	70	93	106	102	100	90	90
Total Estimated White-tailed Deer Harvest	90	67	73	89	81	87	82	77
Antlered White-tailed Deer Harvested	48	41	43	36	44	37	32	56
Antlerless White-tailed Deer Harvested	42	26	30	53	37	50	50	21
White-tailed Deer Bucks with 5 or more antler points	15	4	11	11	14	6	11	9
Proportion of 5+ antler point White-tailed Deer Bucks	31%	10%	26%	31%	32%	16%	34%	16%
<b>Archery Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<i>Total Estimated Deer Harvest *</i>	154	196	182	191	177	156	174	195
Total Estimated White-tailed Deer Harvest	79	95	88	100	85	78	80	100
Antlered White-tailed Deer Harvested	28	25	34	31	36	33	35	50
Antlerless White-tailed Deer Harvested	49	69	54	49	48	45	44	41
White-tailed Deer Bucks with 5 or more antler points	6	0	6	3	5	10	5	17
Proportion of 5+ antler point White-tailed Bucks	21%	0%	18%	10%	14%	30%	14%	34%

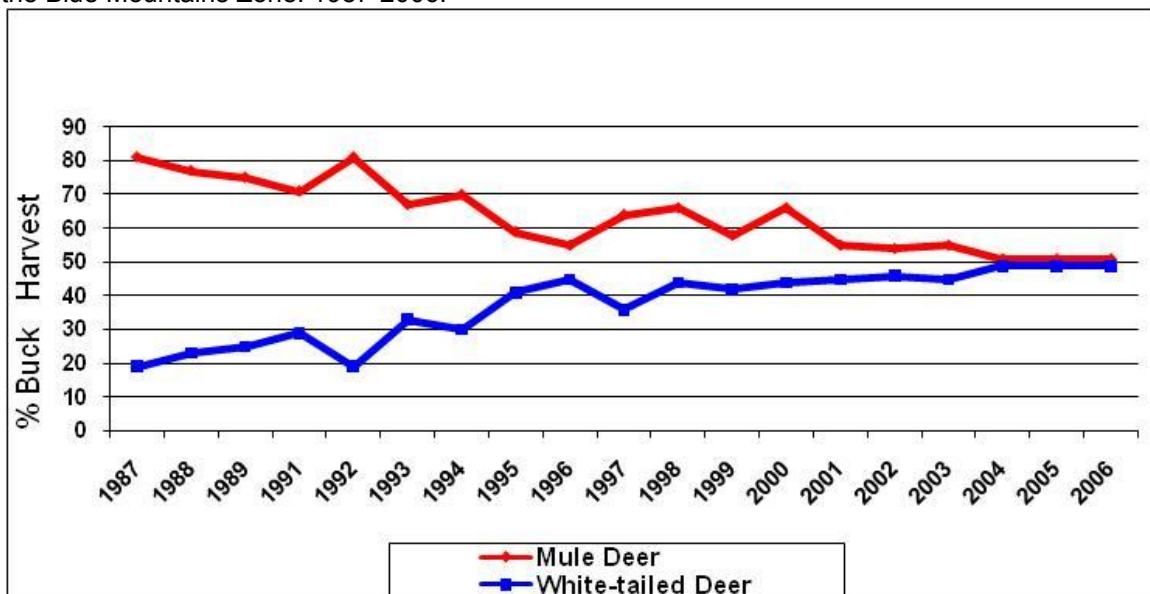
\* Combines both white-tailed deer and mule deer

Figure 2.20. Proportion of all white-tailed deer bucks taken by hunters within the Blue Mountains Zone, 2001-2008 that had at least 5 points on the larger antler.



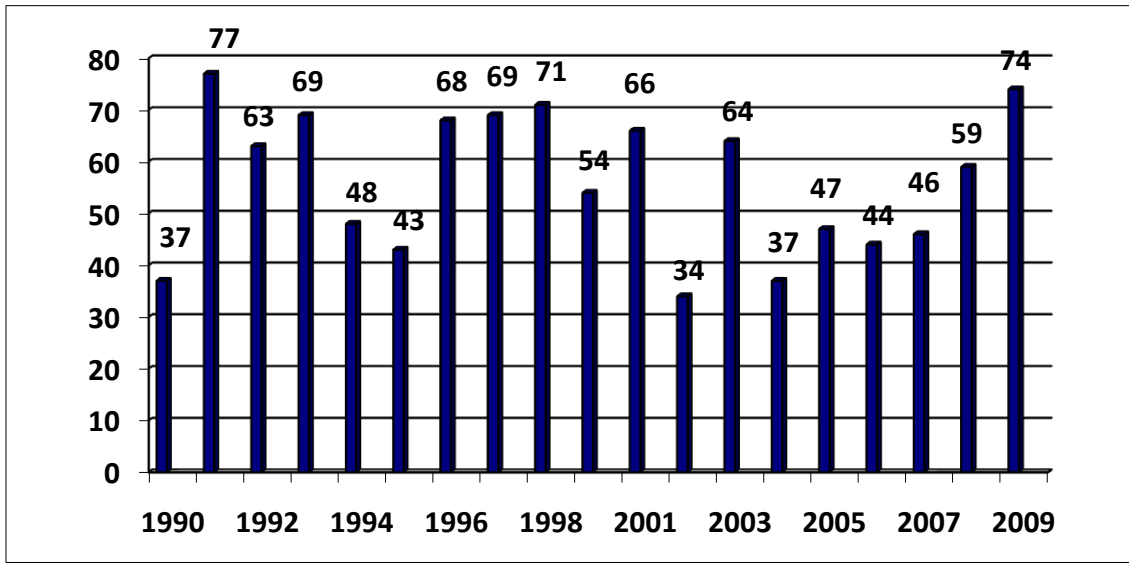
The composition of the buck harvest prior to 1990 consisted of approximately 78% mule deer, and only 22% white-tailed deer. During the 1990s, the composition of the harvest began to change as the white-tailed deer population increased, and the percentage of white-tailed deer bucks in the harvest increased to 40%. Since 2004, the percentage of white-tailed deer bucks in the harvest increased to 49% (Figure 2.21).

Figure 2.21. Proportion of antlered buck hunter harvest for white-tailed versus mule deer within the Blue Mountains Zone. 1987-2006.



Fawn:doe ratios have oscillated quite a bit since 1990 (Figure 2.22). At the time of this writing, recent fawn:doe ratios have been on an upward trend in the Blue Mountains White-tailed Deer Zone. This is likely a response to post-wildfire, habitat responses in the southeast.

Figure 2.22. White-tailed Deer Fawn:Doe Ratios – Blue Mountains



White-tailed deer were harvested under an “any antlered buck” regulation prior to 1991. Post-hunt buck:doe ratios for white-tailed deer were very low prior to 1991, averaging three bucks per 100 does from 1978 to 1990. In 1991, white-tailed deer bucks were included with mule deer under the three-point regulation to improve post-hunt buck:doe ratios. Buck ratios began to improve and have averaged 20 bucks per 100 does since 1994.

The quality of white-tailed deer bucks in the harvest has improved since implementation of the three-point regulation. From 1977-1990, the percentage of bucks with five or more antler points in the harvest averaged 9%. Since 1991, the percentage of bucks harvested with five or more points has more than doubled, averaging 20% in recent years (Figure 2.20). Field personnel have also noted an increase in mature white-tailed deer bucks checked during the hunting season, along with the number of mature bucks observed during pre and post-hunt surveys.

Currently, opportunity to harvest antlerless white-tailed deer is provided to youth, senior, and disabled hunters during the general season in seven GMUs: 154, 162, 163, 172, 175, 178, and 181. General season archery and muzzleloader hunters also have the opportunity to harvest antlerless white-tailed deer. Permit controlled hunts for antlerless white-tailed deer are provided in nine GMUs, while three additional late permit controlled hunts (two modern firearm and one muzzleloader) are provided that allow harvest of three-point minimum antlered or antlerless white-tailed deer.

### Black Bear Management

Black bear management in the Blue Mountains White-tailed Deer Zones has been to manage for stable populations using the guidelines in the Game Management Plan (WDFW 2008). White-tailed deer and black bears are managed differently and the white-tailed deer zones do not coincide with black bear management units. The Blue Mountains Black Bear Management Unit most closely matches the Blue Mountains White-tailed Deer Zone (Table 2.22). Total black bear harvest in the past 9 years has ranged from 87 to 178 (Figure 2.23, Table 2.23) in this assemblage of GMUs. The general season structure for black bears in the Blue Mountains White-tailed Deer Zones has been consistent for the past 10 years. Black bear hunter numbers have been somewhat

variable in the Blue Mountains with some GMUs remaining fairly constant and others increasing or decreasing over the 9 year period (Table 2.24).

**Table 2.22. Game Management Units in common between the Blue Mountains Black Bear Management Unit and the Blue Mountains White-tailed Deer Zone.**

Game Management Units that make up the Blue Mountains White-tailed Deer Zones	Game Management Units that make up the Blue Mountains Black Bear Management Unit
	145
	149
154	154
157	157
162	162
163	163
166	166
169	169
172	172
175	175
178	178
181	181
186	186

**Figure 2.23. Black bear harvest estimated for the Blue Mountains White-tailed Deer Zone from 2001 to 2009.**

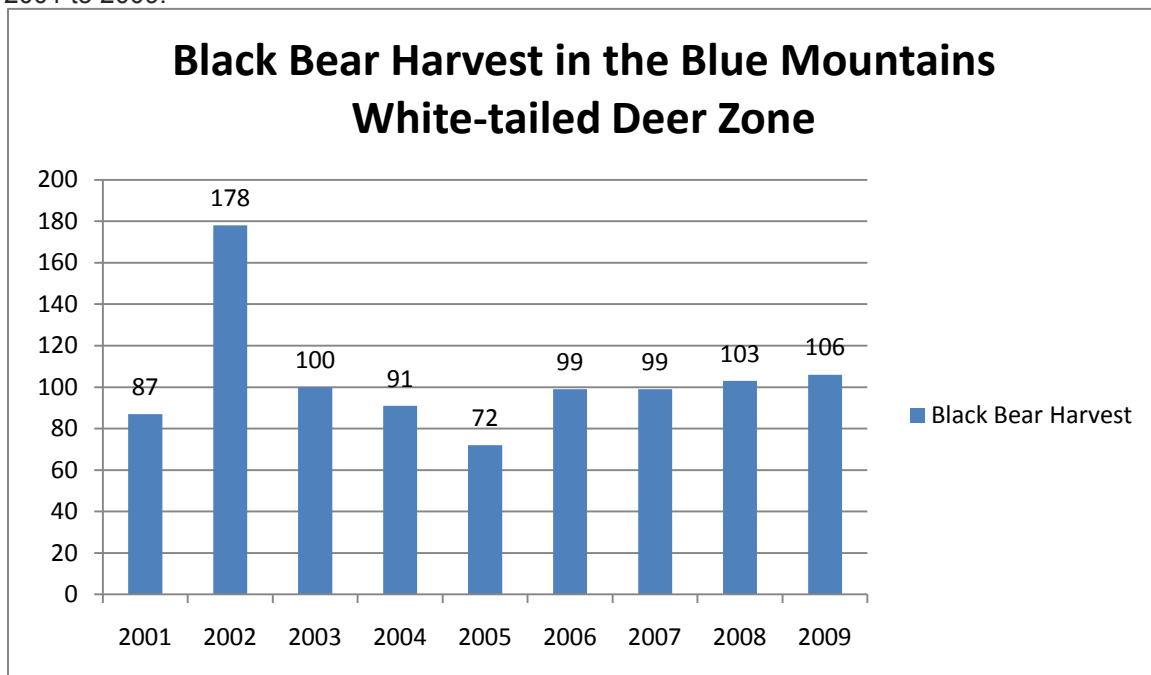


Table 2.23. Black bear harvest by GMU in the Blue Mountains White-tailed Deer Zone 2001 to 2009.

Game Management Units	Year								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
154	26	49	40	30	26	34	39	34	28
162	24	47	34	33	18	27	17	20	30
163	1	0	1	1	1	1	1	1	0
166	7	11	5	7	5	8	3	7	10
169	7	34	3	7	4	8	11	13	8
172	6	10	7	2	7	3	6	13	17
175	1	6	6	4	5	8	17	6	8
178	2	8	0	2	3	3	3	1	0
181	7	5	0	4	3	6	1	7	0
186	6	8	4	1	0	1	1	1	5
<b>Total</b>	<b>87</b>	<b>178</b>	<b>100</b>	<b>91</b>	<b>72</b>	<b>99</b>	<b>99</b>	<b>103</b>	<b>106</b>

The median age data for female black bears harvested from 2001 through 2008 have mostly been below objective with no discernable trend (Figure 2.24). To maintain consistency with the Game Management Plan (manage for a stable bear population), if additional bear harvest pressure was implemented to benefit white-tailed deer, it could be applied to the male component of this black bear population (WDFW 2008).

Figure 2.24. Median Age of Harvested Female Black Bears in the Northeastern Black Bear Management Unit 2001 to 2008.

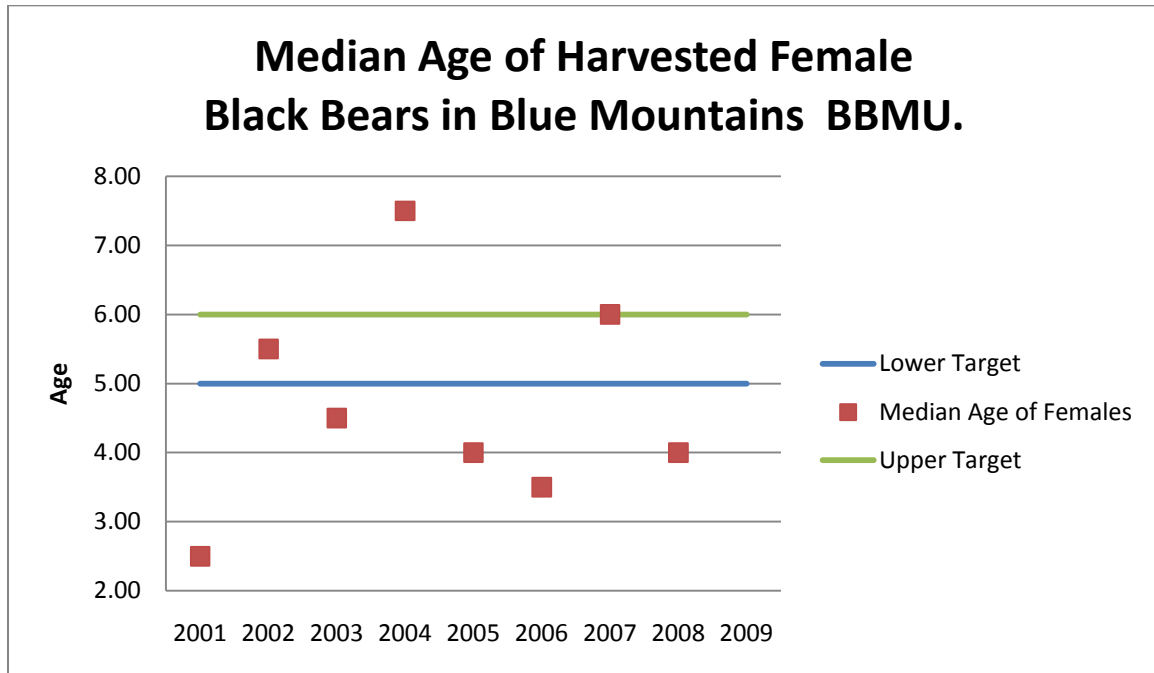




Table 2.24. Black bear hunter numbers estimated for the Blue Mountains White-tailed Deer Zone for 2001 to 2009.

GMUs	2001	2002	2003	2004	2005	2006	2007	2008	2009
154	351	372	334	329	296	307	303	320	301
162	455	505	435	439	376	341	403	437	448
163	24	22	30	28	28	36	31	36	12
166	200	200	162	144	114	89	93	116	131
169	135	152	124	139	97	100	121	152	144
172	91	98	81	70	76	67	78	120	77
175	100	108	100	130	122	97	146	138	164
178	71	70	49	51	42	59	64	60	59
181	74	65	57	49	33	37	44	69	31
186	25	35	18	18	8	8	10	22	12
<b>Total</b>	<b>1,526</b>	<b>1,627</b>	<b>1,390</b>	<b>1,397</b>	<b>1,192</b>	<b>1,141</b>	<b>1,293</b>	<b>1,470</b>	<b>1,379</b>

### Cougar Management

Cougar management decisions are made at the cougar management unit level. The objective for cougar management in the Blue Mountains White-tailed Deer Zone is to manage for a stable population (WDFW 2008). The Blue Mountains White-tailed Deer Zone coincides fairly well with the Blue Mountains Cougar Management Unit. Lethal cougar removals typically come in the form of recreational harvest, depredation removals associated with complaints made by livestock growers, and public safety removals. Total cougar removals in the Blue Mountains have declined over the 9 year period (Table 2.25).

Table 2.25. Total cougar removals by GMU in the Blue Mountains White-tailed Deer Zone 2001 to 2009. Removals include hunting, depredation removals, and public safety removals.

Game Management Units	Year								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
154	4	4	3	2	2	2	0	5	2
162	3	1	4	6	1	3	4	2	3
163	1	0	1	1	0	1	1	0	0
166	0	0	1	2	0	2	0	2	1
169	0	0	1	0	0	0	0	0	1
172	2	5	1	1	0	1	3	4	0
175	1	1	1	0	1	0	0	0	1
178	2	0	2	0	0	0	0	0	0
181	5	1	3	2	1	5	1	0	0
186	1	0	0	0	0	0	0	0	0
<b>Total</b>	<b>19</b>	<b>12</b>	<b>17</b>	<b>14</b>	<b>5</b>	<b>14</b>	<b>9</b>	<b>13</b>	<b>8</b>

## 2.4 Columbia Basin Zone

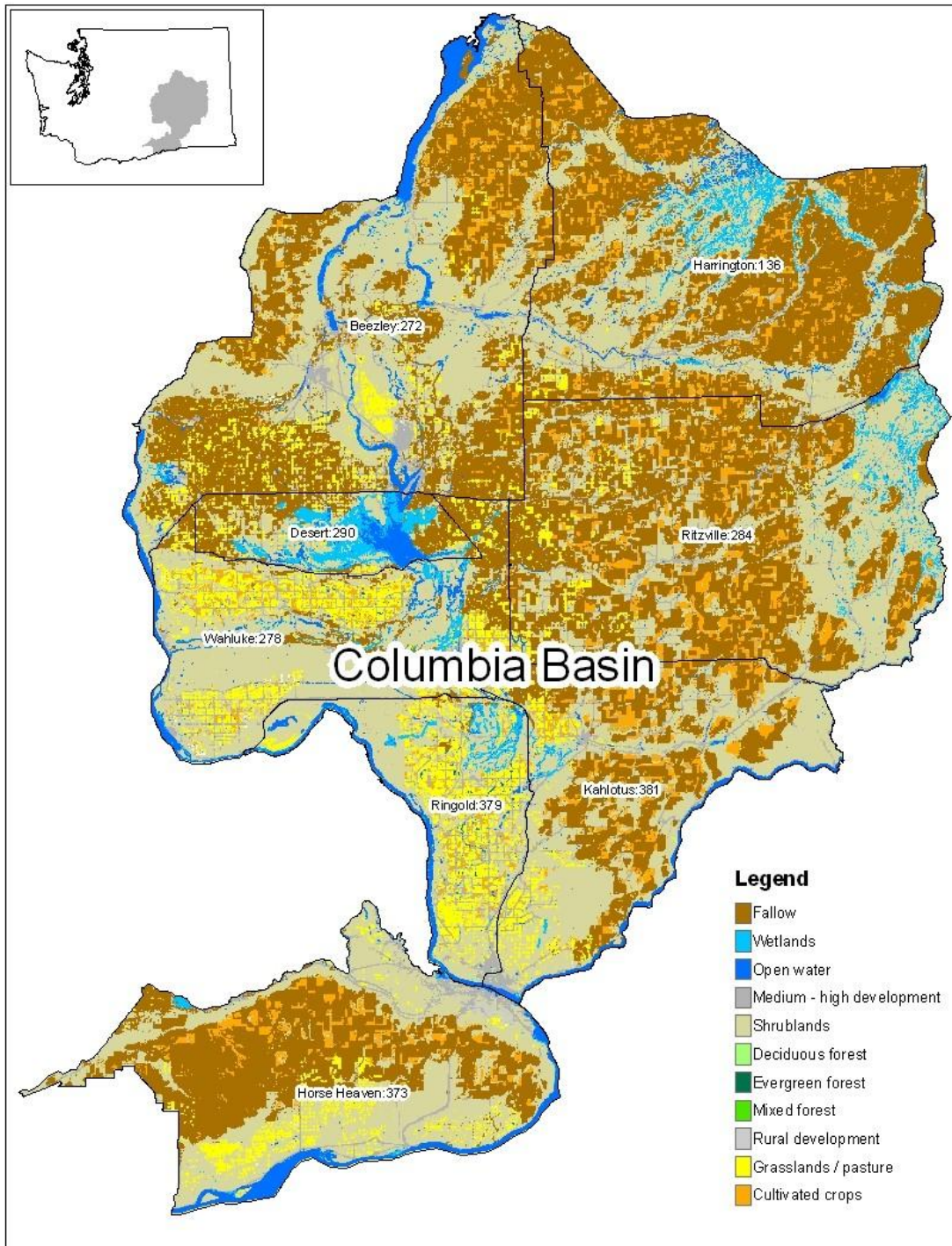


Figure 2.25. Columbia Basin White-tailed Deer Management Zone.

## Population Goal

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White-tailed deer in the Columbia Basin Zone will be managed for the current levels of population size and distribution.

### *Columbia Basin Zone Population Goal – Maintain*

#### **Strategy:**

- Recommend hunting season structures and opportunity that will maintain white-tailed deer at their current numbers and distribution, while still attempting to maintain some opportunity for all user groups.

The Columbia Basin is primarily mule deer habitat. As such, white-tailed deer are not specifically surveyed in this zone. When mule deer are surveyed, occasional white-tailed deer sightings are recorded. In the course of a survey effort that documents hundreds and possibly thousands of mule deer over several days, the number of white-tailed deer observed could be less than 10. The Columbia Basin is not optimal white-tailed deer habitat and there is no management objective to change the distribution or numbers of the few white-tailed deer that reside there.

## Management Direction for White-tailed Deer in the Columbia Basin Zone

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White-tailed deer are much less abundant than mule deer within the Columbia Basin Zone. Habitats within the Columbia Basin Zone are more suitable to exploitation by mule deer than white-tailed deer, and the area currently provides important mule deer hunting opportunity. Because of this and limited public support for any increases in white-tailed deer presence in south-central Washington, the proposed strategy for management of white-tailed deer in the Columbia Basin Zone is status quo. White-tailed deer provide some limited deer hunting opportunity within the zone and likely will continue to do so for the foreseeable future. However, overall deer harvest management will be focused on maintaining the current distribution and abundance of white-tailed deer within the Columbia Basin. Little change in white-tailed deer hunting opportunity in this zone is anticipated in the short-term, but small numbers of white-tailed deer, including older bucks will continue to be harvested in the GMUs comprising the Columbia Basin Zone.

## Description

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The Columbia Basin White-tailed Deer Management Zone is 8,774 square miles and includes Game Management Units (GMUs) 136, 272, 278, 284, 290, 373, 379, and 381 (Figure 2.25). This zone is relatively arid, but the Columbia Basin Irrigation Project has facilitated extensive irrigated agriculture throughout this region of Washington. Approximately 86% of the Columbia Basin White-tailed Deer Zone is private land (Figure 2.26 and Table 2.26). The Washington Department of Natural Resources manages the largest area of public land (~5%) in the zone. The majority of the available habitat for deer consists of arid shrub-steppe lands, agricultural lands, and some Palouse prairie in eastern portions of the zone (Figure 2.27 and Table 2.27). The overall road density is 1.9 miles of roadway per square mile. Because most of the zone is in private ownership, deer hunting opportunities are largely limited by access to private lands.

The Columbia Basin zone represents the periphery of white-tailed distribution in central Washington, and habitats present are generally more suitable for mule deer. The overall numbers of white-tailed deer are low in all GMUs within the zone; generally, white-tailed deer are found mostly in the eastern portion of the zone. Mule deer numbers are much higher than white-tailed deer numbers in all GMUs in the Columbia Basin Zone. As such, deer harvest in the Columbia Basin Zone is dominated by mule deer, and most deer hunting recreation is focused on mule deer.

Current general hunting seasons for white-tailed deer include nine days of modern firearm in seven GMUs, seven days of muzzleloader in four GMUs, and 49 days of archery hunting in five GMUs (41 days in GMU 136). Currently, modern firearm hunters may only take antlered white-tailed deer, except in GMU 379, where any white-tailed deer may be taken. Archery hunters may take any white-tailed deer (except bucks must be three-point minimum in GMU 136). Muzzleloader hunters may take any antlered white-tailed deer in GMUs 278 and 284, but are limited to three-point or better bucks or antlerless white-tailed deer in GMU 381. Muzzleloaders may take any white-tailed deer in GMU 379. Special permits for limited entry deer hunting in GMUs comprising the Columbia Basin Zone are generally valid for white-tailed deer, if other restrictions defining legal deer (sex and/or antler restrictions) are complied with, but mule deer also make up the majority of special permit harvests in this zone. Among the Columbia Basin GMUs, the highest white-tailed deer harvest consistently comes from GMU 136, which usually exceeds 50% of the total white-tailed deer harvest within the entire zone.

The Yakama Nation and the Confederated Tribes of Umatilla Indians have off-reservation treaty hunting rights within the southern portion of the Columbia Basin Zone. Both tribes can promulgate hunting regulations for their members to hunt white-tailed deer on “open and unclaimed lands” within their ceded area.

In general, white-tailed deer in the Columbia Basin Zone are associated with habitats of very limited extent, such as riparian areas along creeks and streams, CRP grasslands, and non-intensive agricultural tracts. White-tailed deer use in the extensive tracts of shrub-steppe within the zone is not common. Deer use of large, intensively farmed agricultural lands is low, both for white-tailed deer and mule deer in the Columbia Basin Zone.

Table 2.28 presents a summary of recent deer harvests within the Columbia Basin Zone. From 2001 through 2008, the annual average hunter harvest of white-tailed deer was only 114, which was the lowest for any zone. The average number of white-tailed deer bucks taken annually was 94. Appendix B.4 summarizes deer hunter densities and harvest success rates by hunting method on an individual GMU basis. Deer hunter densities are consistently less than one per square mile within each of the eight GMUs comprising the Columbia Basin Zone. Typically hunter densities are substantially lower during archery and muzzleloader seasons than during modern firearm seasons. Hunter densities also tend to be lower in GMUs that are predominately private land. In general, about one in three hunters will harvest a deer each year, depending upon the GMU and hunting method: archery, muzzleloader, or modern firearm (Appendix B.4). Hunter harvest of mature white-tailed bucks with five or more antler points on the larger antler averaged 28% during 2001–2008 (Figure 2.28).

Figure 2.26. Major categories of landowners within the Columbia Basin Zone.

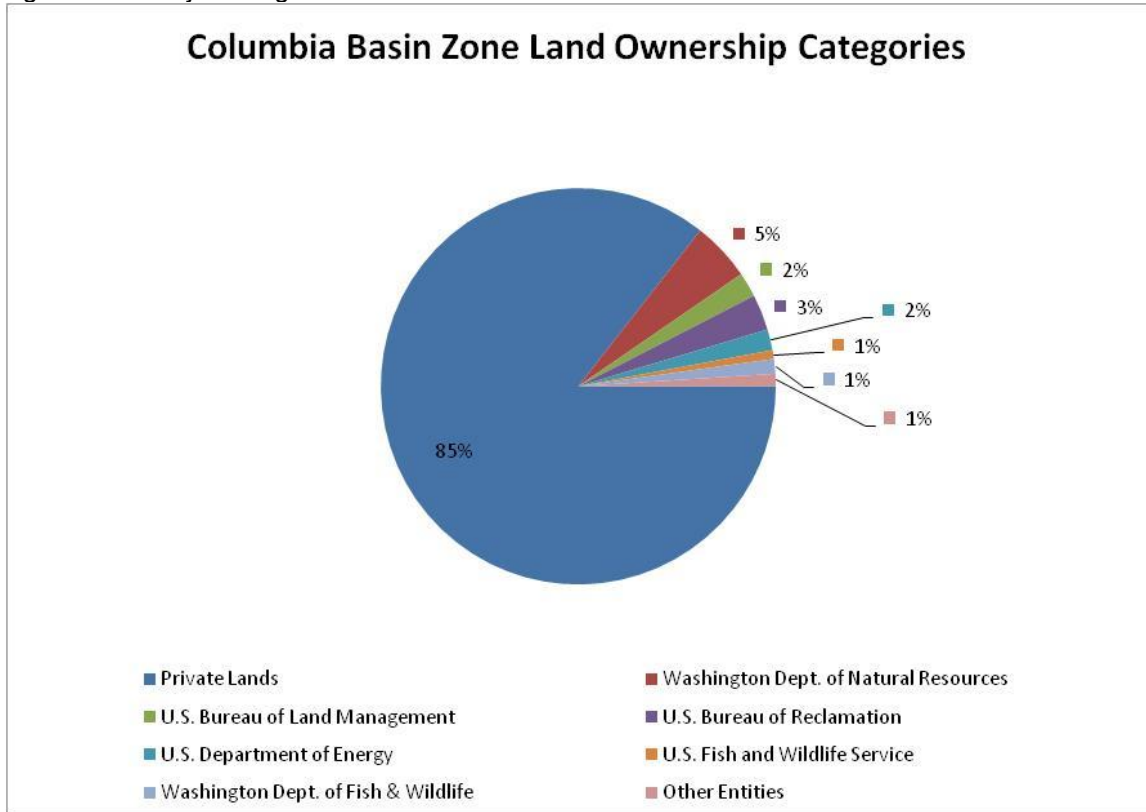


Table 2.26. Major landowner categories within the Columbia Basin Zone.

Landowner Category	Acres	Percentage
Private Lands	4,816,135	85.8%
Washington Department of Natural Resources	268,042	4.8%
U.S. Bureau of Reclamation	163,968	2.9%
U.S. Bureau of Land Management	140,287	2.5%
U.S. Department of Energy	98,170	1.7%
Washington Department of Fish & Wildlife	64,818	1.2%
U.S. Fish and Wildlife Service	39,160	0.7%
U.S. Department of Defense	18,414	0.3%
Washington Department of Parks & Recreation	6,171	0.1%
Municipal Government	267	< 0.1%
Other	125	< 0.1%
<b>Total Acreage of Zone:</b>	<b>5,615,557</b>	<b>100.0%</b>

Figure 2.27. Major categories of land cover within the Columbia Basin Zone.

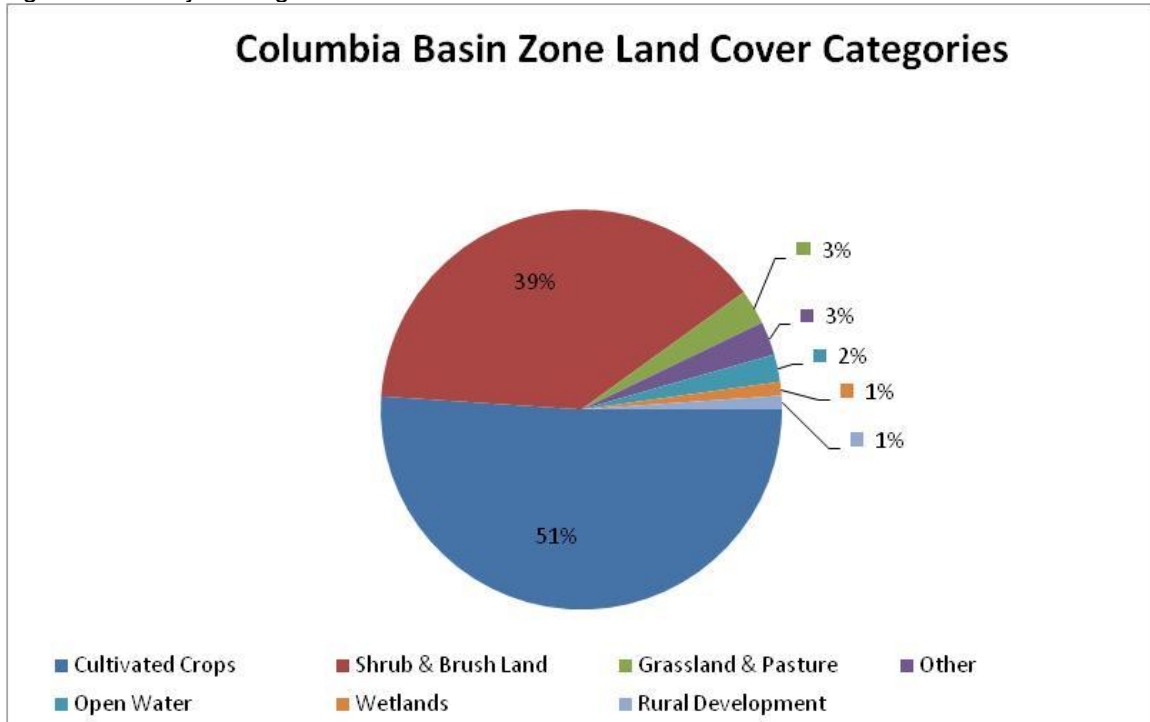


Table 2.27. Major land cover categories within the Columbia Basin Zone.

Land Cover Category	Acres	Percentage
Cultivated Crops	2,853,824	50.8%
Shrub & Brush Land	2,178,512	38.8%
Grassland & Pasture	154,804	2.8%
Other	151,268	2.7%
Open Water	122,260	2.2%
Wetlands	64,464	1.1%
Rural Development	63,588	1.1%
Urban Development	22,497	0.4%
Coniferous Forest	2,454	< 0.1%
Broad-leaf Forest	1,886	< 0.1%
<b>Total Acreage of Zone:</b>	<b>5,615,557</b>	<b>100.0%</b>

### Historical Perspective

Since the turn of the last century, white-tailed deer have not been common on the landscape encompassed by the Columbia Basin Zone, probably as a result of the area representing marginal habitat for white-tailed deer during the last few centuries. As white-tailed deer populations have grown in eastern Washington, white-tailed deer have increasingly exploited suitable habitats along the periphery of the Columbia Basin Zone. In recent time, white-tailed deer have occurred consistently, but at very low density in most GMUs comprising the Columbia Basin White-tailed Deer Zone. Some deer hunters believe that white-tailed deer numbers may have increased in recent years in some GMUs within the zone, but harvest data provide very little support for this theory.

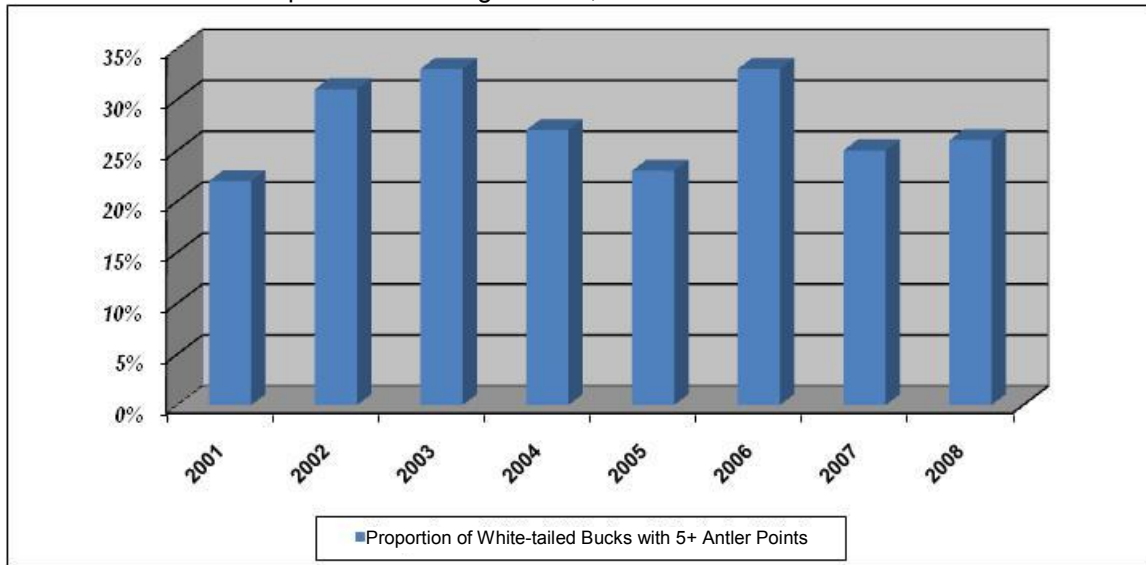
Because the Columbia Basin Zone provides significant mule deer hunting opportunity, including trophy buck hunting opportunity, hunters have commonly expressed concern about any expansion in white-tailed deer numbers or distribution in this part of Washington. There is a common perception among hunters that white-tailed deer and mule deer compete strongly, and that increases in white-tailed deer density may lead to reduced mule deer populations. Scientific evidence on this topic throughout the West has been ambiguous, at best.

Table 2.28. Trend in hunter harvest of deer within the Columbia Basin Zone, 2001-2008.

<b>All Deer Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	1,687	1,796	1,385	1,494	1,417	1,430	1,521	1,767
Total Estimated White-tailed Deer Harvest	111	106	125	115	119	78	115	156
Antlered White-tailed Deer Harvested	97	91	111	78	103	61	88	135
Antlerless White-tailed Deer Harvested	13	15	14	36	13	15	24	21
Antlerless Harvest as a Percentage of Antlered Harvest	13%	16%	13%	46%	13%	25%	27%	16%
White-tailed Deer Bucks with 5 or more antler points	21	28	37	21	24	20	22	35
Proportion of 5+ antler point White-tailed Deer Bucks	22%	31%	33%	27%	23%	33%	25%	26%
<b>Modern Firearm Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	1,382	1,402	1,127	1,263	1,177	1,197	1,272	1,463
Total Estimated White-tailed Deer Harvest	100	99	122	110	115	71	108	148
Antlered White-tailed Deer Harvested	90	86	108	77	101	57	84	128
Antlerless White-tailed Deer Harvested	10	13	14	33	14	14	24	20
White-tailed Deer Bucks with 5 or more antler points	19	24	37	20	23	18	21	35
Proportion of 5+ antler point White-tailed Deer Bucks	21%	28%	34%	26%	23%	32%	25%	27%
<b>Muzzleloader Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	221	306	168	137	139	111	102	135
Total Estimated White-tailed Deer Harvest	6	6	2	2	1	2	1	8
Antlered White-tailed Deer Harvested	5	4	2	0	2	1	1	7
Antlerless White-tailed Deer Harvested	1	2	0	1	1	1	0	1
White-tailed Deer Bucks with 5 or more antler points	2	4	0	0	1	0	0	0
Proportion of 5+ antler point White-tailed Deer Bucks	40%	100%	0%	0%	50%	0%	0%	0%
<b>Archery Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	84	88	90	94	101	122	143	169
Total Estimated White-tailed Deer Harvest	5	1	1	3	3	5	6	0
Antlered White-tailed Deer Harvested	2	1	1	1	0	3	3	0
Antlerless White-tailed Deer Harvested	2	0	0	2	0	0	0	0
White-tailed Deer Bucks with 5 or more antler points	0	0	0	1	0	2	1	0
Proportion of 5+ antler point White-tailed Deer Bucks	0%	0%	0%	100%	0%	67%	33%	0%

\*Combines both white-tailed deer and mule deer

Figure 2.28. Proportion of all white-tailed deer bucks taken by hunters within the Columbia Basin Zone that had at least 5 points on the larger antler, 2001-2008.



## Cougar Management

For the most part, the Columbia Basin White-tailed Deer Zone is considered unsustainable for cougar populations (WDFW 2008). In this suite of GMUs, the annual lethal removals have not exceeded 1 cougar per year for the years 2001-2009 (Table 2.29).

Table 2.29. Total cougar removals by GMU in the Columbia Basin White-tailed Deer Zone 2001 to 2009. Removals include hunting, depredation removals, and public safety removals.

Game Management Units	Year								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
136	0	0	0	0	0	0	0	0	1
272	0	0	1	1	0	1	0	1	0
278	0	0	0	0	0	0	0	0	0
290	0	0	0	0	0	0	0	0	0
373	0	0	0	0	0	0	1	0	0
379	0	0	0	0	0	0	0	0	0
381	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>



## 2.5 Okanogan Highlands Zone

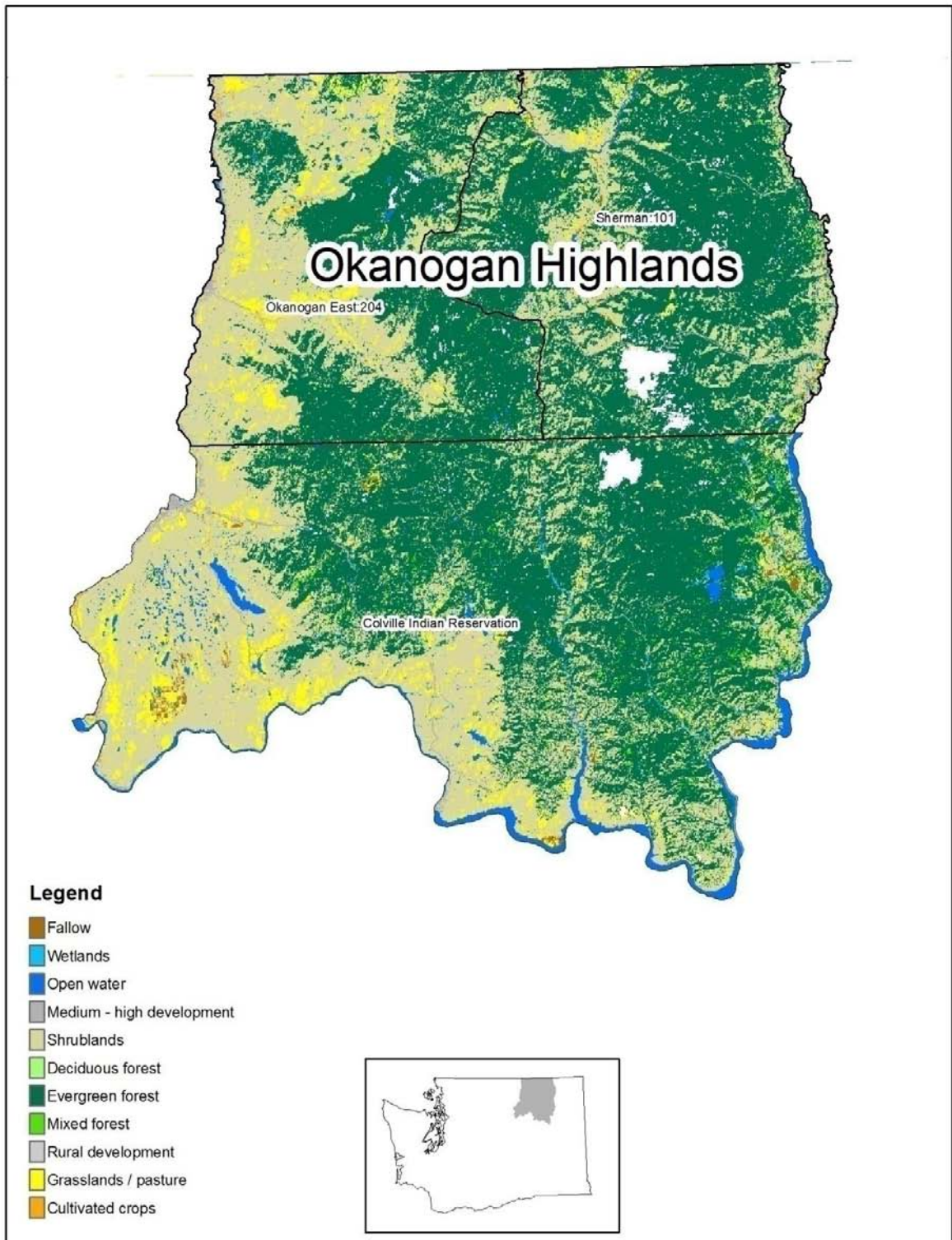


Figure 2.29. Okanogan Highlands White-tailed Deer Management Zone.

## Population Goal

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The white-tailed deer population within the Okanogan Highlands Zone is recovering from the winters of 2007-08 and 2008-09. These two winter events were not as severe as that which occurred further east within the Selkirk Zone. The population objective for this zone is to maintain the current white-tailed deer numbers and distribution.

### *Okanogan Highlands Population Goal - Maintain*

#### **Strategy:**

- Recommend hunting season structures and opportunity that will maintain white-tailed deer at their current numbers and distribution, while still attempting to maintain some opportunity for all user groups.

Both white-tailed and mule deer are common within the Okanogan Highlands Zone. Recent harvest data show more white-tailed deer than mule deer taken by hunters, however, the hunting seasons for white-tailed deer have been more liberal in terms of number of days offered and antlerless opportunity offered. Since 2001, white-tailed deer have accounted for 59 to 71% of the total deer harvest in the Okanogan Highlands Zone.

Unlike the uniform distribution of mule deer, white-tailed deer have a patchy distribution throughout the Okanogan Highlands Zone, but are mainly concentrated in and near the lower elevation valleys particularly where there is active alfalfa hay and cereal grain agricultural production. Outside of the winter months, about 95% of the Okanogan Highlands Zone is generally occupied by mule deer, but white-tailed deer occupy substantially fewer square miles of the zone. If white-tailed deer equal or exceed mule deer numbers in the Okanogan Highlands, some of those patches by white-tailed deer will have much higher than average densities of deer to account for the consistently higher white-tailed deer harvest in this zone.

White-tailed deer densities may range from 0 per square mile in the least appropriate habitat such as dense conifer forest at high elevations, to 30 or more deer per square mile within the highest quality habitat such as the agricultural-forest mosaic adjacent to valley bottoms. Because winter range is a major limiting factor in the Okanogan Highlands, the year-round deer density throughout the zone is likely to be low. Assuming a conservative overall population density of 3 to 5 white-tailed deer per square mile in what is perceived to be generic deer habitat regardless of quality, the Okanogan Highlands Zone could harbor a population of about 12,000 to 20,000 white-tailed deer. Moreover this estimate represents a highly dynamic population number that fluctuates throughout the year when fawning, migration, and mortality from winter-kill, predation, and hunting are all considered.

Composition surveys to estimate buck, doe, and fawn ratios are conducted for both white-tailed and mule deer annually in August and September. The current sampling design does not facilitate an estimation of deer densities, however. Current staff level and budgetary constraints limit the collection of an adequate sample size. In the future designated transects could be established as a means of monitoring deer observed per mile. Likewise hunter check station data are limited as very few white-tailed deer harvested in GMUs 101 and 204 are brought to check stations run near Winthrop and Deer Park.

## Management Direction for White-tailed Deer in the Okanogan Highlands Zone

White-tailed deer seem to be more abundant than mule deer within the Okanogan Highlands Zone based on recent harvest data. Management emphasis is to maintain white-tailed deer populations that support hunting recreation and hunter satisfaction at recent or higher levels. Management of white-tailed deer within the Okanogan Highlands Zone is complicated by their migratory nature. An unknown proportion of the herd is in British Columbia, Canada during the general hunting seasons in Washington.

### Description

The Okanogan Highlands White-tailed Deer Management Zone includes only Game Management Units (GMUs) 101 and 204 (Figure 2.29). This zone is 4,286 square miles, and the majority of the zone is public land consisting of coniferous forest habitat (Figures 2.30, 2.31 and Tables 2.30, 2.31). The overall road density is 2.3 miles of roadway per square mile. Approximately half of the Okanogan Highlands Zone is comprised of the Colville Indian Reservation. In addition, the Colville Tribe retains hunting, fishing, and gathering rights on public lands in what is referred to as the “North Half”, an area that was once part of the reservation.

Current general hunting seasons for white-tailed deer include 16 days of modern firearm in GMU 101, nine days of modern firearm in GMU 204, seven days of muzzleloader, and 56 days of archery seasons. Modern firearm hunters may only take antlered white-tailed deer unless they are youth, senior, disabled, or special permit holders. These latter groups are allowed to take any white-tailed deer. Archery and muzzleloader hunters may take any white-tailed deer during their respective seasons, except that they may only take bucks in GMU 204. Various numbers of special permits for antlered or antlerless deer are allocated annually by lottery draw for the different user groups.

The Colville Confederated Tribes can promulgate hunting regulations for their members to hunt white-tailed deer throughout the Okanogan Highlands Zone on their reservation and in the former “North Half” of their reservation (GMUs 101 and 204).

Table 2.32 presents a summary of recent deer harvests within the Okanogan Highlands Zone. From 2001 through 2008, the annual average hunter harvest of white-tailed deer was 1,228, and the average number of antlered white-tailed deer taken annually was 824. Appendix B.5 summarizes deer hunter densities and harvest success rates by hunting method on an individual GMU basis. Deer hunter densities have ranged from less than one to almost four hunters per square mile within the two GMUs comprising the Okanogan Highlands Zone, depending upon the year and hunting method. Typically, hunter densities are substantially lower during archery and muzzleloader seasons than during modern firearm seasons. In general, one in four hunters will harvest a deer each year, depending upon the GMU and hunting method: archery, muzzleloader, or modern firearm (Appendix B.5). Hunter harvest of mature white-tailed bucks with five or more antler points on the larger antler averaged 18% during 2001–2008 (Figure 2.32).

Figure 2.30. Major categories of landowners within the Okanogan Highlands Zone.

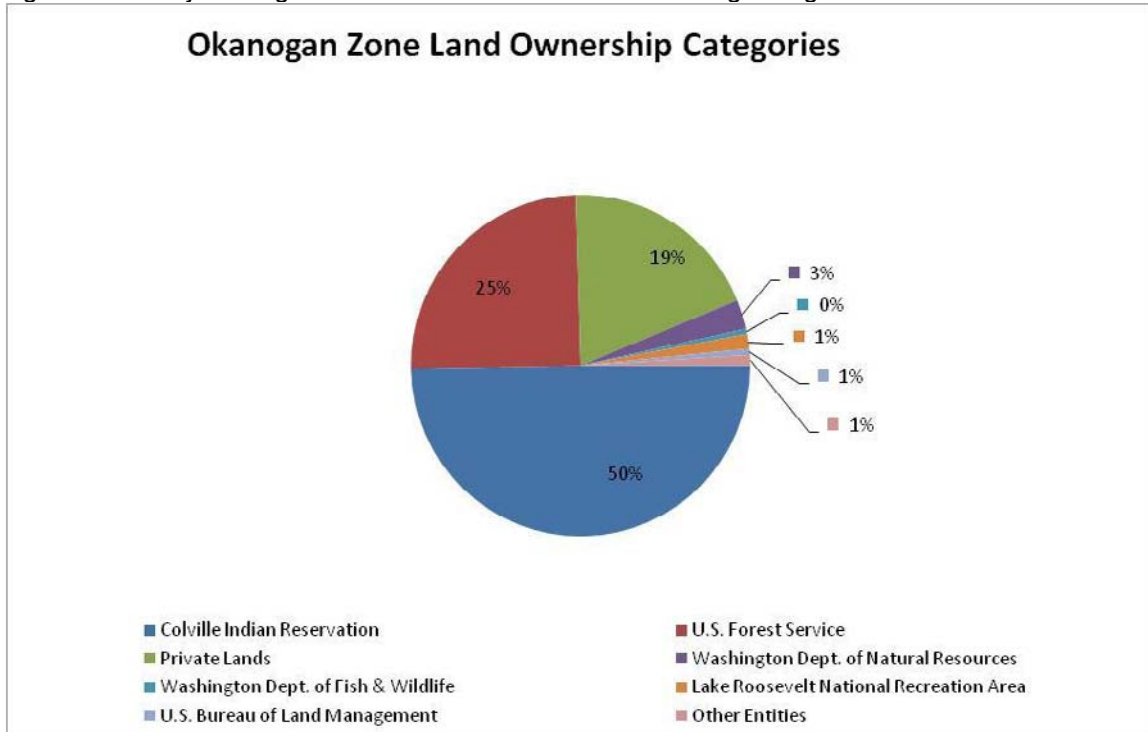


Table 2.30. Major landowner categories within the Okanogan Highlands Zone.

Landowner Category	Acres	Percentage
Colville Indian Reservation	1,360,363	49.6%
U.S. Forest Service	705,161	25.7%
Private Lands	530,009	19.3%
Washington Department of Natural Resources	77,951	2.8%
Lake Roosevelt National Recreation Area	38,928	1.4%
U.S. Bureau of Land Management	16,621	0.6%
Washington Department of Fish & Wildlife	13,030	0.5%
Washington Department of Parks & Recreation	597	< 0.1%
U.S. Department of Defense	379	< 0.1%
<b>Total Acreage of Zone:</b>	<b>2,743,039</b>	<b>100.0%</b>

Figure 2.31. Major categories of land cover within the Okanogan Highlands Zone.

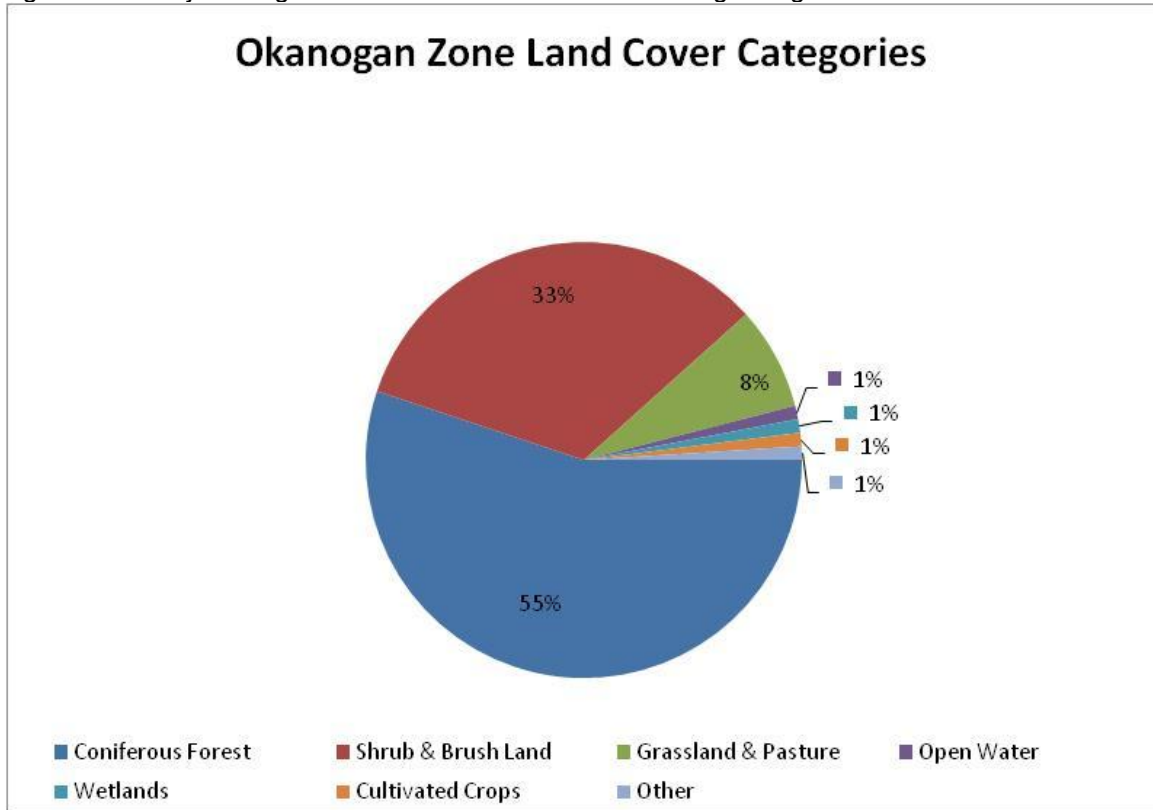


Table 2.31. Major land cover categories within the Okanogan Highlands Zone.

Land Cover Category	Acres	Percentage
Coniferous Forest	1,504,991	54.9%
Shrub & Brush Land	907,983	33.1%
Grassland & Pasture	207,839	7.6%
Open Water	46,231	1.7%
Wetlands	24,379	0.9%
Cultivated Crops	19,733	0.7%
Other	18,670	0.7%
Rural Development	7,384	0.3%
Broad-leaf Forest	4,689	0.2%
Urban Development	1,140	< 0.1%
<b>Total Acreage of Zone:</b>	<b>2,743,039</b>	<b>100.0%</b>

### Historical Perspective

Historically, the Okanogan Highlands Zone has been populated by both white-tailed deer and mule deer. White-tailed deer, while historically present at low densities since the fur trade era, appear to have increased in numbers within this zone in recent time. They are most abundant within the broader valley bottoms along the major river courses and at the forest edges. As farming, logging, and other land uses have changed the landscape, favorable habitat conditions for white-tailed deer

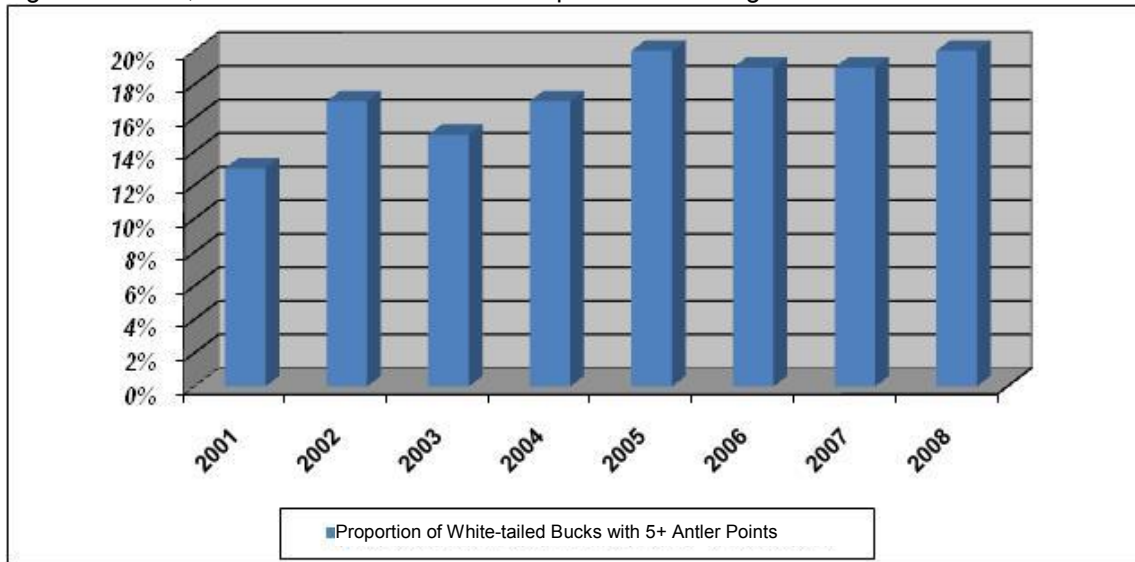
have been created on a broad scale. Irrigated farmland and forest encroachment in open areas, in particular, appear to have encouraged colonization by white-tailed deer.

Table 2.32. Trend in hunter harvest of deer within the Okanogan Highlands Zone, 2001-2008.

<b>All Deer Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	1,816	1,689	1,902	2,268	2,003	2,069	2,036	1,789
Total Estimated White-tailed Deer Harvest	1,285	1,165	1,200	1,327	1,225	1,309	1,242	1,073
Antlered White-tailed Deer Harvested	834	800	776	894	825	922	814	725
Antlerless White-tailed Deer Harvested	451	365	424	433	400	387	428	348
Antlerless Harvest as a Percentage of Antlered Harvest	54%	46%	55%	48%	48%	42%	53%	48%
White-tailed Deer Bucks with 5 or more antler points	106	135	120	148	166	175	155	147
Proportion of 5+ antler point White-tailed Deer Bucks	13%	17%	15%	17%	20%	19%	19%	20%
<b>Modern Firearm Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	1,589	1,473	1,565	1,900	1,548	1,584	1,568	1,280
Total Estimated White-tailed Deer Harvest	1,081	981	949	1,053	897	949	915	720
Antlered White-tailed Deer Harvested	710	703	638	725	632	705	612	507
Antlerless White-tailed Deer Harvested	371	278	311	328	265	244	303	213
White-tailed Deer Bucks with 5 or more antler points	75	114	84	112	106	119	96	90
Proportion of 5+ antler point White-tailed Deer Bucks	11%	16%	13%	15%	17%	17%	16%	18%
<b>Muzzleloader Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	3	0	86	110	124	122	120	141
Total Estimated White-tailed Deer Harvest	3	0	65	72	76	84	79	90
Antlered White-tailed Deer Harvested	1	0	29	40	43	48	36	34
Antlerless White-tailed Deer Harvested	2	0	36	32	33	36	43	56
White-tailed Deer Bucks with 5 or more antler points	0	0	3	8	8	7	5	6
Proportion of 5+ antler point White-tailed Deer Bucks	0%	.	10%	20%	19%	15%	14%	18%
<b>Archery Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	224	216	251	258	331	363	347	364
Total Estimated White-tailed Deer Harvest	201	184	186	202	252	276	247	260
Antlered White-tailed Deer Harvested	123	97	109	129	150	169	166	181
Antlerless White-tailed Deer Harvested	78	87	77	73	102	107	81	79
White-tailed Deer Bucks with 5 or more antler points	31	21	33	28	52	49	54	50
Proportion of 5+ antler point White-tailed Deer Bucks	25%	22%	30%	22%	35%	29%	33%	28%

\* Combines both white-tailed deer and mule deer

Figure 2.32. Proportion of all white-tailed deer bucks taken by hunters within the Okanogan Highlands Zone, 2001-2008 that had at least 5 points on the larger antler.



### Black Bear Management

The Okanogan Highlands White-tailed Deer Zone combined with Selkirk White-tailed Deer Zone overlaps with the Northeastern Black Bear Management Unit. Black bear harvest in the past 9 years in GMUs 101 and 204 has ranged from a low of 96 to a high of 139 (Table 2.8). The general season structure for black bears in the Okanogan Highlands White-tailed Deer Zones has been consistent for the past 10 years. To maintain consistency with the Game Management Plan 2009-2015 (manage for a stable bear population), if additional black bear harvest pressure were warranted it should be applied to the male portion of the population (WDFW 2008). See the previous black bear management discussion in the Selkirk Zone section for harvest and hunter numbers data for GMUs 101 and 204.

### Cougar Management

Cougar management decisions are made at the cougar management unit level. The objective for cougar management in the Okanogan White-tailed Deer Zone is to manage for a stable population at the 2007 level (WDFW 2008). If monitoring indicates that cougar numbers are higher than they were in 2007, additional cougar hunting pressure will need to be exerted to bring the population to objective.

The Okanogan Highlands White-tailed Deer Zone is a portion of the Northeastern Cougar Management Unit (WDFW 2008). Lethal cougar removals typically come in the form of recreational harvest, depredation removals associated with complaints made by livestock growers, and public safety removals. Total cougar removals have declined over the 9 year time period (Table 2.33).

Table 2.33. Total cougar removals by GMU in the Okanogan Highlands White-tailed Deer Zone 2001 to 2009. Removals include hunting, depredation removals, and public safety removals.

Game Management Units	Year								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
101	19	20	16	13	15	8	14	6	3
204	12	17	15	7	10	9	6	5	3
<b>Total</b>	<b>31</b>	<b>37</b>	<b>31</b>	<b>20</b>	<b>25</b>	<b>17</b>	<b>20</b>	<b>11</b>	<b>6</b>

In 1996, Voter Initiative 655 significantly altered cougar harvest and impacts to cougar seasons. The initiative banned the use of dogs for hunting cougar. To maintain cougar harvest, the Fish and Wildlife Commission increased cougar season length from about 3 to 7 ½ months, permit-only seasons were replaced with general seasons, the bag limit increased from 1 to 2 cougar per year, and the cost of a cougar transport tag decreased from \$24 to about \$10.

In the Okanogan Highlands white-tailed deer zones, the WDFW specifically adopted the objective to continue managing for reduced cougar levels between 2004 and 2007. In 2008, the cougar population objective was updated to manage for stable cougar populations, but at the reduced 2007 population level. Harvest levels since 2008 are aimed to achieving that objective (WDFW 2008).



## 2.6 North Cascades Zone

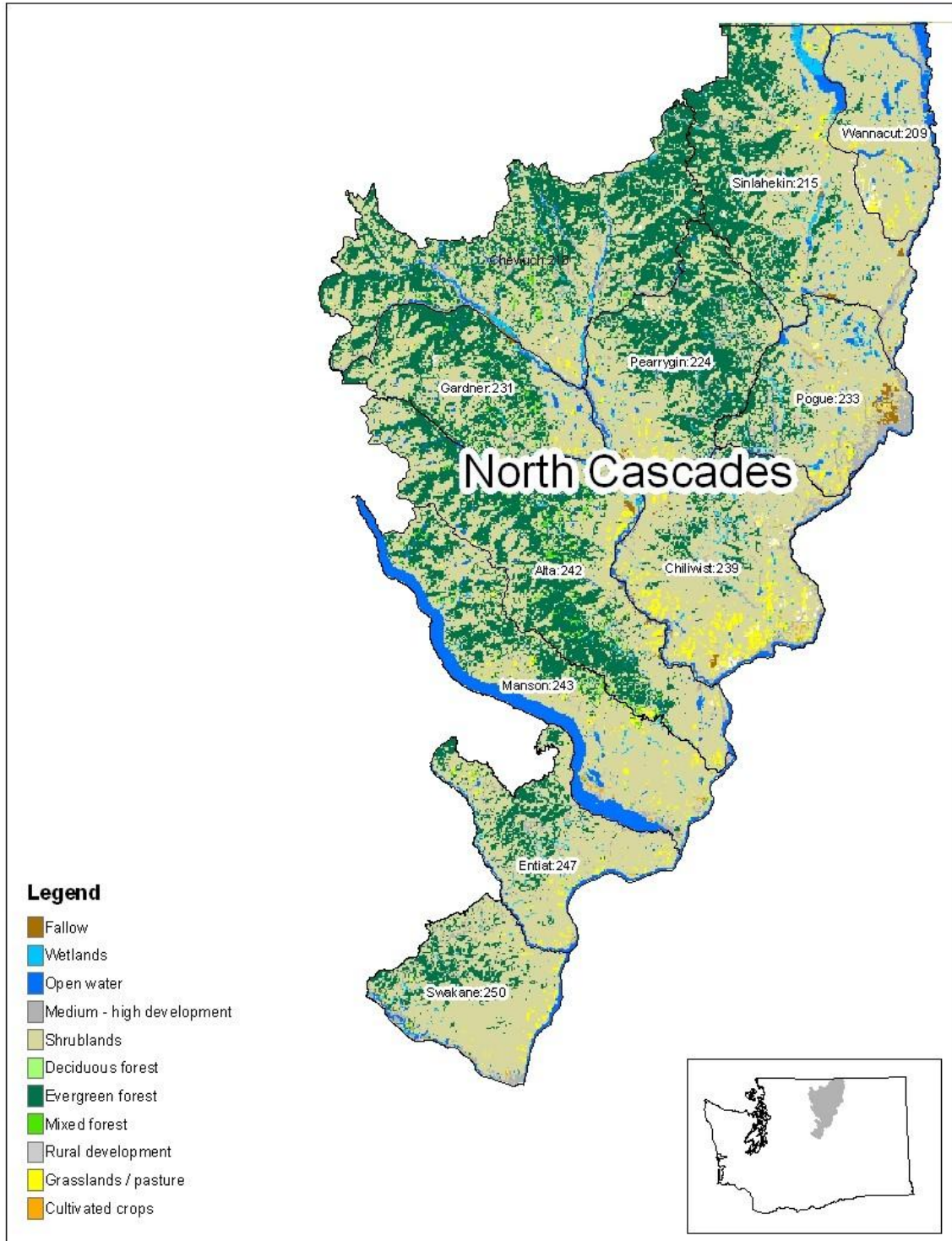


Figure 2.33. North Cascades White-tailed Deer Management Zone.

## Population Goal

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The white-tailed deer population in the North Cascades Zone is being managed for the current level of population size and distribution. If nuisance or agricultural damage problems develop or increase, hunting season structure will be modified to address those issues.

### *North Cascades Zone Population Goal – Maintain*

#### **Strategy:**

- Recommend hunting season structures and opportunity that will maintain white-tailed deer at their current numbers and distribution, while still attempting to maintain some opportunity for all user groups.

For the North Cascades Zone we have minimal data to help us understand white-tailed deer demographics. These data are collected incidentally during mule deer surveys. As a result, we have inadequate data available to annually confirm the population objective is being met.

Metrics like antler point distribution or percent white-tailed deer in the harvest are checked to see if there are any alarming trends. Department biologists have recognized the existing data shortcomings and as a result have been more conservative in crafting white-tailed deer general season lengths, scaling them back to be generally be in line with mule deer seasons. This likely means we are managing white-tailed deer conservatively in this zone, given their greater fecundity and proclivity for private land (i.e., reduced vulnerability to harvest). Staff priorities and resources in the North Cascades Zone would have to be shifted away from mule deer, bighorn sheep, and endangered species/non-game species of concern to focus more attention on white-tailed deer.

## Management Direction for White-tailed Deer in the North Cascades Zone

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White-tailed deer have increased in the North Cascades Zone since the early 1900s and are established in nearly all major drainages and valley bottoms. In some areas, white-tailed deer (in conjunction with mule deer) are causing nuisance/damage complaints. The overall goals for white-tailed deer management in the North Cascades Zone are to provide for a sustainable harvest for all user groups when possible, maintain a standard of at least 15 to 19 bucks per 100 does in post-hunt surveys, maintain white-tailed deer populations within landowner social tolerances, and minimize agricultural damage caused by deer (WDFW 2008). Management actions designed to maintain adequate harvest pressure on antlerless deer is a priority where nuisance or damage issues exist. If white-tailed populations decline, the antlerless harvest will be reduced in an attempt to stabilize the populations at the desired level.

## Description

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The North Cascades White-tailed Deer Management Zone is 3,443 square miles and includes Game Management Units (GMUs) 209, 215, 218, 224, 231, 233, 239, 242, 243, 247, and 250 (Figure 2.33). This is a mountainous zone with diverse habitats from low elevation shrub steppe in the valley bottoms, transitioning to ponderosa pine forest and mixed conifer forest, up to sub-alpine and alpine habitats in the highest elevations. Habitats in this zone support larger populations of mule deer than white-tailed deer. White-tailed deer predominately inhabit the lower

reaches of the major drainages and valley bottoms with some expansion into the mid elevations. Just over 72% of the zone is in public ownership with the U.S. Forest Service managing the largest area of public land (~53%) in the zone (Figure 2.34, 2.35 and Tables 2.34, 2.35). Road density averages 2.3 miles of roadway per square mile of land.

White-tailed deer occur in much smaller numbers than mule deer within the North Cascades Zone. Thus, mule deer are the focus of deer hunting recreation and make up the majority of the deer harvest in this zone. Current general hunting seasons for white-tailed deer include nine days of modern firearm (entire zone), seven days of muzzleloader (six GMUs), 30 days of early archery hunting (entire zone), and 19 days of late archery hunting (five GMUs). Modern firearm and muzzleloader hunters may take any antlered white-tailed deer, whereas archery hunters may take any white-tailed deer during their respective seasons. Various special permits for antlered or antlerless white-tailed deer are allocated annually among the different user groups. Special permits for “any deer” or “antlerless only” are also allocated in this zone and are valid for white-tailed deer or mule deer, although mule deer are mostly harvested under these permits. Additional antlerless permits are issued, depending upon population status and the level of damage complaints.

The Yakama Nation has an off-reservation treaty hunting right within the southern portion of the North Cascades Zone. The Yakama Nation can promulgate hunting regulations for their members to hunt white-tailed deer on “open and unclaimed lands” within their ceded area.

Table 2.36 presents a summary of recent deer harvests within the North Cascades Zone. From 2001 through 2008, the annual average hunter harvest of white-tailed deer was 288 and the average number of antlered white-tail bucks taken annually was 211. Appendix B.6 summarizes deer hunter densities and harvest success rates by hunting method on an individual GMU basis. Deer hunter densities have ranged from less than one to almost nine hunters per square mile within each of the 11 GMUs comprising the North Cascades Zone, depending upon the year and hunting method. Typically, hunter densities are substantially lower during archery and muzzleloader seasons than during modern firearm seasons. Hunter densities also tend to be lower in GMUs that are predominately private land. Generally speaking, one in five hunters will harvest a deer each year, depending upon the GMU and hunting method: archery, muzzleloader, or modern firearm (Appendix B.6). Hunter harvest of mature white-tailed bucks with 5 or more antler points on the larger antler averaged 17% during 2001–2008 (Figure 2.36).

Figure 2.34. Major categories of landowners within the North Cascades Zone.

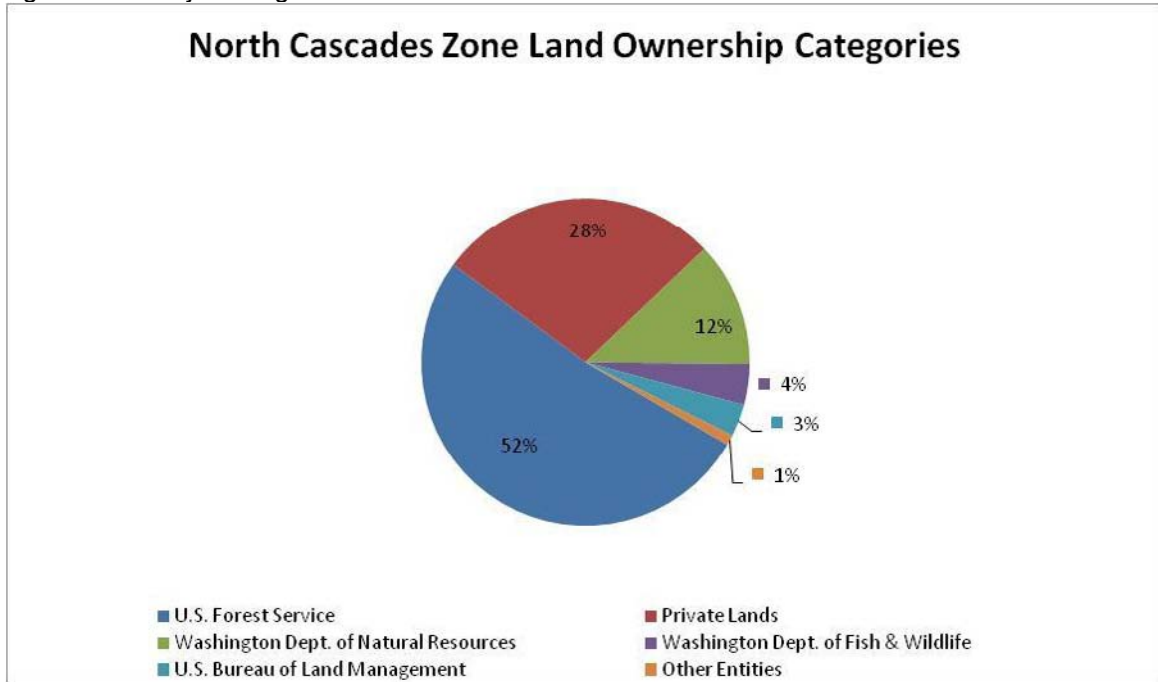


Table 2.34. Major landowner categories within the North Cascades Zone.

Landowner Category	Acres	Percentage
U.S. Forest Service	1,159,624	52.6%
Private Lands	616,653	28.0%
Washington Department of Natural Resources	271,767	12.3%
Washington Department of Fish & Wildlife	77,477	3.5%
U.S. Bureau of Land Management	70,242	3.2%
U.S. Fish and Wildlife Service	5,724	0.3%
Washington Department of Parks & Recreation	1,780	0.1%
U.S. National Park Service	256	< 0.1%
Colville Confederated Tribes	33	< 0.1%
<b>Total Acreage of Zone</b>	<b>2,203,556</b>	<b>100.0%</b>

Figure 2.35. Major categories of land cover within the North Cascades Zone.

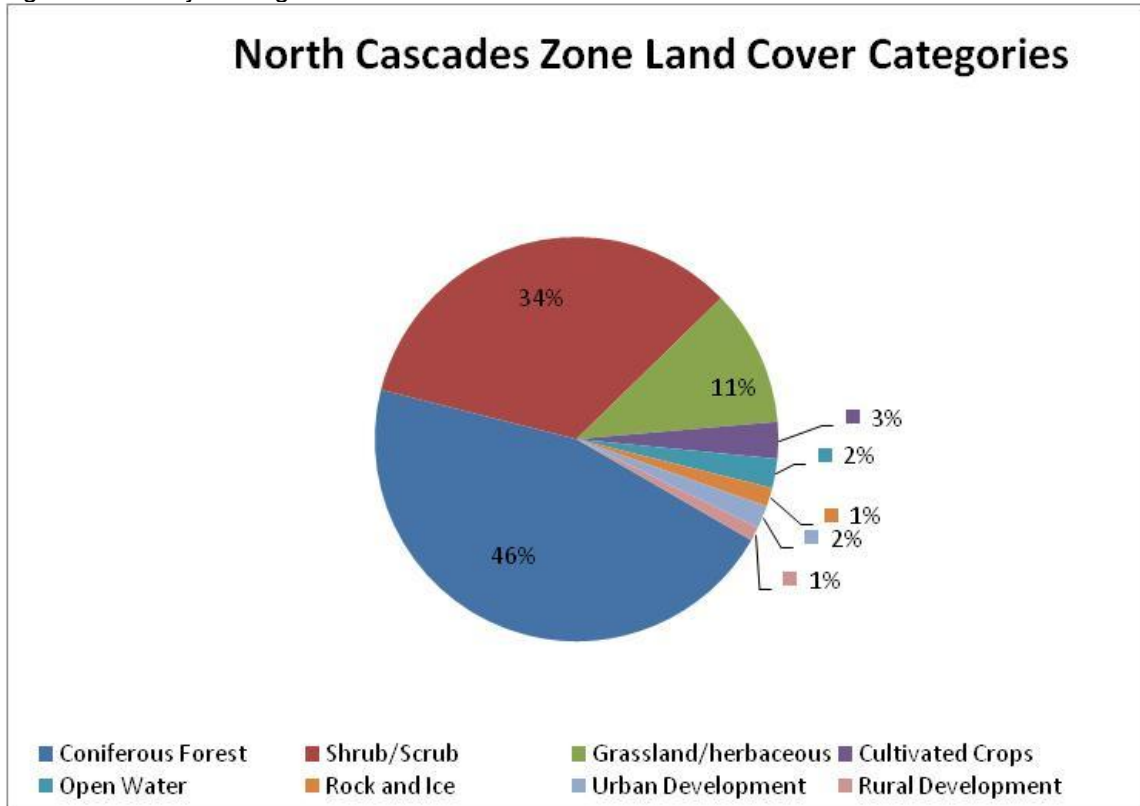


Table 2.35. Major land cover categories within the North Cascades Zone.

Land Cover Category	Acres	Percentage
Coniferous Forest	993,910	45.1%
Shrub/Scrub	734,849	33.4%
Grassland/herbaceous	238,969	10.8%
Cultivated Crops	64,572	2.9%
Open Water	50,784	2.3%
Urban Development	40,622	1.8%
Rock and Ice	33,493	1.5%
Rural Development	23,522	1.1%
Wetlands	18,478	0.8%
Deciduous Forest	4,357	0.2%
<b>Total Acreage of Zone</b>	<b>2,203,556</b>	<b>100.0%</b>

### Historical Perspective

The history of white-tailed deer in the North Cascades Zone has not been thoroughly researched. All deer populations have increased dramatically, however, since the early 1900s. Zeigler (1978) noted that Andrew Johnson, who homesteaded along the Okanogan River (northeast part of the zone), reported “an abundance of deer, chiefly whitetails in the valley” during 1889. All deer suffered severe losses during the winter of 1889-1890 and remained scarce for the next 30-40 years. There was no legal deer season in most of the zone during 1923-1924 (Zeigler 1978). Deer

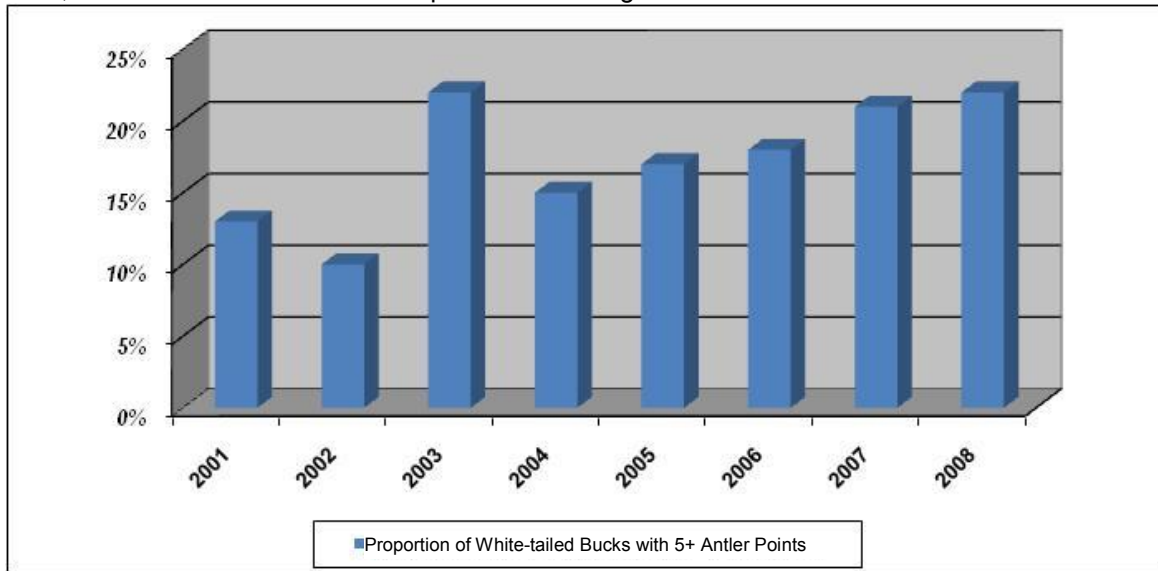
populations grew dramatically during the 1930s and 1940s, with populations peaking in the late 1940s through 1960s. Presumably, white-tailed deer also expanded their range within this zone during this time. Deer populations throughout the zone declined during the severe winters of 1968-1969 and 1996-1997. Deer populations continued to increase since the last severe winter of 1996-1997, until the past three winters when increased fawn mortality has occurred.

Table 2.36. Trend in hunter harvest of deer within the North Cascades Zone, 2001-2008.

<b>All Deer Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	3,122	3,389	2,984	3,657	3,154	2,391	2,667	2,120
Total Estimated White-tailed Deer Harvest	324	303	261	298	359	250	264	245
Antlered White-tailed Deer Harvested	223	221	200	235	272	175	175	183
Antlerless White-tailed Deer Harvested	94	79	59	63	78	73	83	60
Antlerless Harvest as a Percentage of Antlered Harvest	42%	36%	30%	27%	29%	42%	47%	33%
White-tailed Deer Bucks with 5 or more antler points	30	21	43	36	46	31	36	41
Proportion of 5+ antler point White-tailed Deer Bucks	13%	10%	22%	15%	17%	18%	21%	22%
<b>Modern Firearm Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	2,619	2,739	2,388	3,049	2,463	1,658	1,995	1,423
Total Estimated White-tailed Deer Harvest	246	264	229	238	301	197	206	196
Antlered White-tailed Deer Harvested	192	197	186	205	245	153	148	150
Antlerless White-tailed Deer Harvested	54	67	43	33	56	44	58	46
White-tailed Deer Bucks with 5 or more antler points	27	16	37	30	43	28	29	32
Proportion of 5+ antler point White-tailed Deer Bucks	14%	8%	20%	15%	18%	18%	20%	21%
<b>Muzzleloader Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	26	74	51	51	63	42	33	45
Total Estimated White-tailed Deer Harvest	5	2	2	0	2	2	1	7
Antlered White-tailed Deer Harvested	4	2	2	0	2	1	1	6
Antlerless White-tailed Deer Harvested	1	0	0	0	0	1	0	1
White-tailed Bucks with 5 or more antler points	1	0	0	0	0	0	0	0
Proportion of 5+ antler point White-tail Bucks	25%	0%	0%	0%	0%	0%	0%	0%
<b>Archery Only Tags</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total Estimated Deer Harvest *	477	576	545	557	628	682	632	644
Total Estimated White-tailed Deer Harvest	73	37	30	60	56	50	56	42
Antlered White-tailed Deer Harvested	27	22	12	30	25	20	25	27
Antlerless White-tailed Deer Harvested	39	12	16	30	22	28	25	13
White-tailed Deer Bucks with 5 or more antler points	2	5	6	6	3	3	7	9
Proportion of 5+ antler point White-tailed Deer Bucks	7%	23%	50%	20%	12%	15%	28%	33%

\* Combines both white-tailed deer and mule deer

Figure 2.36. Proportion of all white-tailed deer bucks taken by hunters within the North Cascades Zone, 2001-2008 that had at least 5 points on the larger antler.



### Black Bear Management

Black bear management in the North Cascades White-tailed Deer Zones has been to manage for stable populations using the guidelines in the Game Management Plan (WDFW 2008). White-tailed deer and black bears are managed differently. The white-tailed deer zones do not coincide with black bear management units. The Okanogan Black Bear Management Unit most closely matches the North Cascades White-tailed Deer Zone (Table 2.37). Total black bear harvest in the past 9 years has ranged from 106 to 179 (Figure 2.37, Table 2.38) in this assemblage of GMUs. Black bear hunter numbers have declined in most but not all of the GMUs in this white-tailed deer zone (Table 2.39). The general season structure for black bears in the North Cascades White-tailed Deer Zones has been consistent for the past 10 years.

Table 2.37. Game Management Units in common between the Okanogan Black Bear Management Unit and the North Cascades White-tailed Deer Zones.

Game Management Units that make up the North Cascades White-tailed Deer Zone	Game Management Units that make up the Okanogan Black Bear Management Unit
	203
209	209
215	215
218	218
224	224
231	231
233	233
239	239
242	242
243	243
247	
250	

Figure 2.37. Black bear harvest estimated for the North Cascades White-tailed Deer Zone from 2001 to 2009.

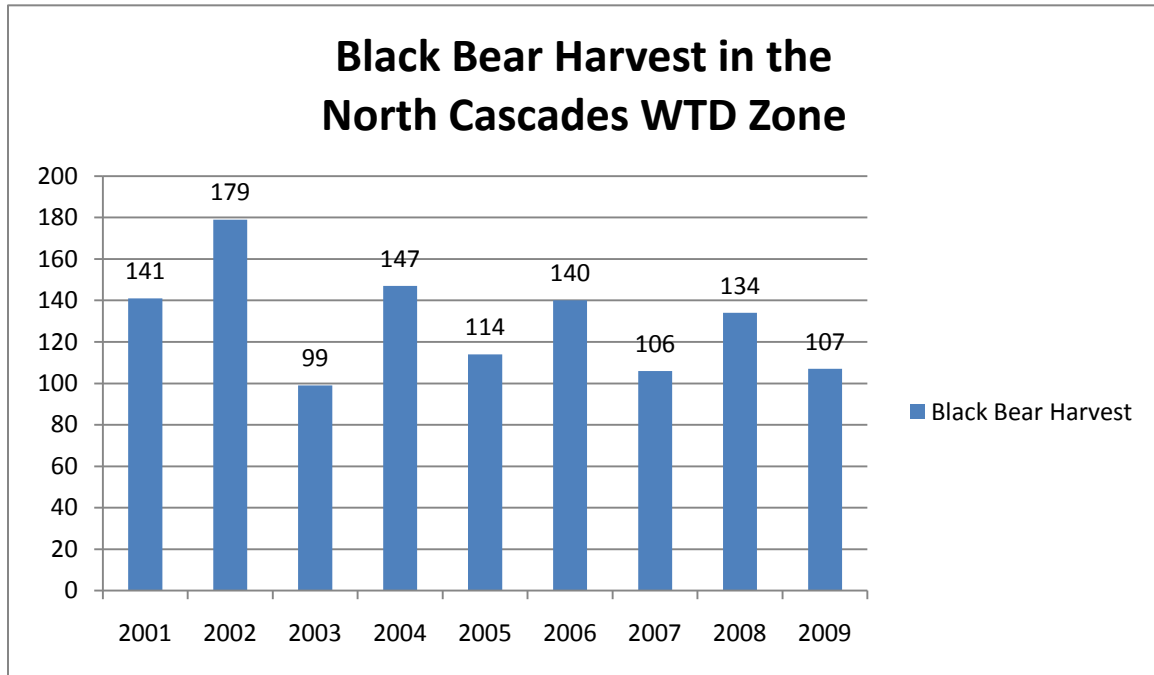


Table 2.38. Black bear harvest by GMU in the North Cascades White-tailed Deer Zone 2001 to 2009.

Game Management Units	Year								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
209	8	16	4	9	5	1	6	4	5
215	14	18	22	22	20	14	19	16	18
218	20	33	12	19	10	14	17	13	11
224	10	11	8	18	7	11	9	16	10
231	12	14	7	10	5	10	9	0	4
233	10	14	10	7	15	17	4	8	13
239	17	11	2	5	8	15	11	10	10
242	15	26	15	22	16	13	8	27	8
243	13	12	4	10	4	19	12	23	8
247	6	9	10	14	15	10	3	7	12
250	16	15	5	11	9	16	8	10	8
<b>Total</b>	<b>141</b>	<b>179</b>	<b>99</b>	<b>147</b>	<b>114</b>	<b>140</b>	<b>106</b>	<b>134</b>	<b>107</b>

The median age for female black bears harvested from 2001 through 2008 have either been at objective or below objective for 4 out of 8 years (Figure 2.38). From 2004 to 2007, the median age of harvested females was below objective. The median age for 2008 showed marked improvement. Until more data are collected, and to maintain consistency with the Game Management Plan (manage for a stable bear population), additional harvest pressure is applied to bears should target the male component of this black bear population (WDFW 2008).



Figure 2.38. Median Age of Harvested Female Black Bears in the Okanogan Black Bear Management Unit 2001 to 2008.

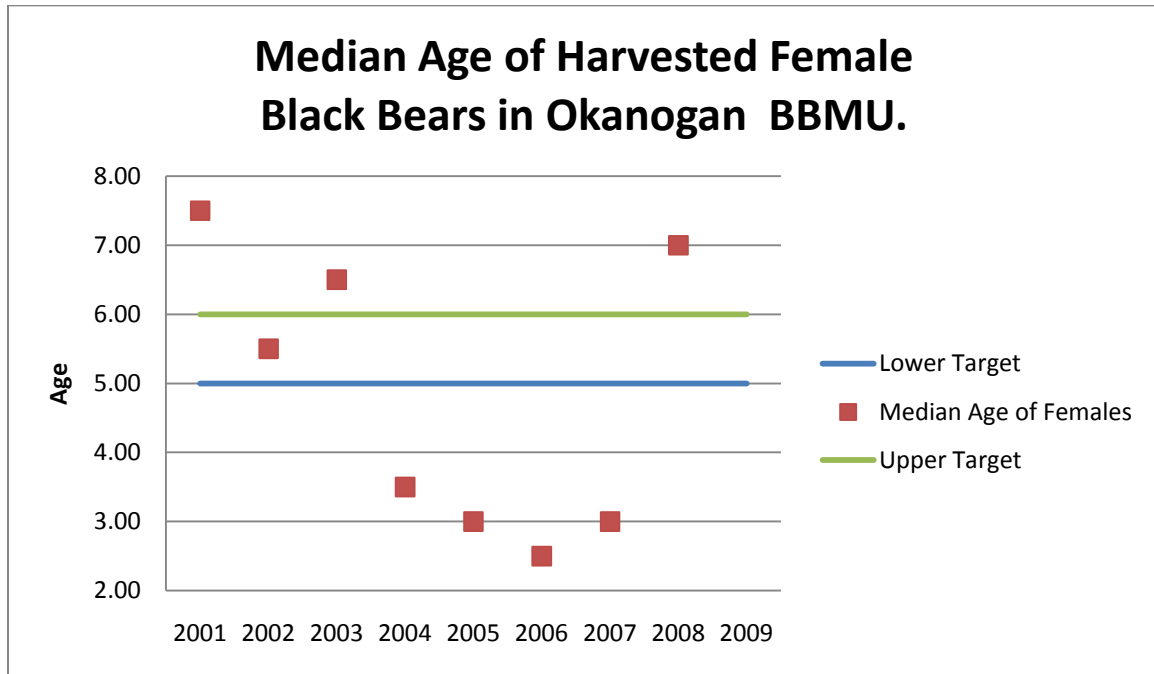


Table 2.39. Black bear hunter numbers estimated for the North Cascades White-tailed Deer Zone for 2001 to 2009.

GMUs	2001	2002	2003	2004	2005	2006	2007	2008	2009
209	128	111	57	66	56	67	54	76	65
215	299	332	277	269	262	236	246	300	300
218	370	414	304	307	280	195	248	240	225
224	254	348	228	249	260	165	235	241	229
231	193	205	145	129	123	109	122	108	80
233	170	156	137	106	117	119	107	143	119
239	143	178	125	149	145	154	142	165	125
242	282	325	258	233	246	248	222	251	223
243	114	80	75	91	106	105	90	136	130
247	170	190	168	175	138	147	167	206	192
250	182	179	105	97	95	146	121	131	134
<b>Total</b>	<b>2,305</b>	<b>2,518</b>	<b>1,879</b>	<b>1,871</b>	<b>1,828</b>	<b>1,691</b>	<b>1,754</b>	<b>1,997</b>	<b>1,822</b>

## Cougar Management

The objective for cougar management in the North Cascades White-tailed Deer Zone is to maintain stable cougar populations at the 2007 level (WDFW 2008). Some increase in harvest pressure may be required to achieve that target. Total cougar removals have declined over the 9 year time period (Table 2.40).

Table 2.40. Total cougar removals by GMU in the North Cascades White-tailed Deer Zone 2001 to 2009. Removals include hunting, depredation removals, and public safety removals.

Game Management Units	Year								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
209	1	0	3	1	0	3	9	1	0
215	8	11	10	14	11	7	2	7	1
218	0	2	1	3	2	2	1	2	2
224	3	5	8	4	4	3	1	1	1
231	1	3	1	1	0	1	4	1	1
233	8	6	4	2	0	0	1	0	1
239	4	0	1	1	5	2	3	3	1
242	3	1	3	7	3	1	7	1	0
243	3	1	1	0	2	0	0	1	0
247	0	0	1	1	0	0	7	2	0
250	6	3	1	0	0	2	0	1	1
<b>Total</b>	<b>37</b>	<b>32</b>	<b>34</b>	<b>34</b>	<b>27</b>	<b>21</b>	<b>34</b>	<b>20</b>	<b>8</b>

In 1996, Voter Initiative 655 significantly altered cougar harvest and impacts to cougar seasons. The initiative banned the use of dogs for hunting cougar. To maintain cougar harvest, the Fish and Wildlife Commission increased cougar season length from about 3 to 7 ½ months, permit-only seasons were replaced with general seasons, the bag limit increased from 1 to 2 cougar per year, and the cost of a cougar transport tag decreased from \$24 to about \$10. Cougar harvest increased annually to the all-time high in 2001, at which time some regional cougar populations likely declined due to high harvest (Lambert et al. 2006).

In the North Cascades white-tailed deer zones (except GMUs 247 and 250), WDFW specifically adopted the objective to continue managing for reduced cougar levels between 2004 and 2007. In 2008, the cougar population objective was updated to manage for stable cougar populations, but at the reduced 2007 population level (WDFW 2008). Harvest levels since 2008 are aimed to achieving that objective.

# Chapter 3: Management Goals and Objectives

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## 3.1 White-tailed Deer Habitat Management

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### Background

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Habitat is the key to the health and well-being of Washington's white-tailed deer populations. A variety of different land use practices can have a profound influence on deer habitat, including urban/suburban development and growth, timber harvest, farming practices, and road and highway construction. Knowledge of white-tailed deer critical habitats and how habitat quality and distribution is changing is important for informed deer management.

White-tailed deer are very adaptable to agricultural land uses and often benefit from higher quality forage produced by agricultural operations (Dusek et al 1989). White-tailed deer will usually thrive in areas where more natural escape cover of forest and shrub dominated habitats are adjacent to agricultural lands such as alfalfa, small grains, and orchards. The Federal Conservation Reserve Program (CRP) has provided important habitat components for white-tailed deer within agricultural areas in the Palouse and Blue Mountains Zones. Specifically, CRP lands can provide both forage and fawn hiding cover. Depending on potential land use practices for a particular piece of land, maintaining or enhancing CRP can be important to maintaining deer populations. In some areas, conversion of alfalfa, small grain, and hay fields to CRP or other uses has likely caused a reduction in overall habitat quality for white-tailed deer because of the loss of high quality agricultural forage. Other federal programs administered by the U.S. Department of Agriculture (USDA) that could potentially benefit white-tailed deer include the Wildlife Habitat Incentive Program (WHIP) and the Environmental Quality Incentives Program (EQIP).

### Objective 3.1.1

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Develop and implement a minimum of six projects to maintain and enhance white-tailed deer habitat conditions on WDFW lands.

### Strategies

- Inventory, map, and evaluate white-tailed deer habitats on WDFW lands.
- Identify and prioritize white-tailed deer habitat maintenance and enhancement activities in annual WDFW Wildlife Area Plan updates.
- The following techniques should be incorporated into habitat enhancement activities:
  - Prescribed burning
  - Mechanical thinning
  - Weed control
  - Forage seeding
  - Planting shrubs
  - Applying fertilizer
  - Controlling access

**Timeline:** Annual, ongoing

**Priority:** High

**Cost:** Covered under current operational costs and grants. Additional funds may be needed to expand the number of projects completed.

### Objective 3.1.2

---

Develop a minimum of twelve new contracts with Private Landowners for habitat enhancement projects that incorporate benefits for white-tailed deer each year.

#### Strategies

- Work with the USDA and landowners to expand the enrollment in CRP, WHIP, and EQIP programs. Encourage development of CRP acres with plantings that incorporate benefits for white-tailed deer through both expansion and mid-contract management.
- Interested private landowners will be encouraged to incorporate white-tailed deer habitat enhancement in management of their lands. The priority for new contracts is in the Selkirk Zone. Other zones will rely on the benefits coming from efforts targeting shrub steppe, Palouse prairie, or pheasant enhancement priorities.

**Timeline:** Annual, ongoing

**Priority:** High

**Cost:** Covered under current operational costs

### Objective 3.1.3

---

WDFW will update Priority Habitats and Species (PHS) information regarding the current condition and distribution of white-tailed deer habitat.

#### Strategies

- Inventory and update PHS layers and GIS map overlays of the state's important white-tailed deer habitat and distribute this information to the interested public and to appropriate federal, state, and county governments when requested.
- Update the PHS management recommendations for white-tailed deer (Rodrick and Milner, 1991).
- Work with public land managers (DNR, USFWS, USFS, BLM, NPS, DOD) to include white-tailed deer habitat guidelines in management of their lands.

**Timeline:** Complete by 2015

**Priority:** Medium

**Cost:** Covered under current operational costs

### Objective 3.1.4

---

Mitigate human development and habitat conversion that negatively impacts white-tailed deer habitat.

#### Strategies

- As part of County Comprehensive Plan Update processes, work with county governments to identify and protect critical white-tailed deer habitat (e.g. winter range) through Open Space designations and/or Critical Areas Ordinances.
- Work with farmland preservation groups to preserve open space for agriculture that also provides benefits to wildlife including white-tailed deer.
- Coordinate with Washington Department of Transportation (WSDOT) and city and county road departments to ensure that crossing structures or other mitigating measures are included in new and existing highways and roads that provide safe movement of white-tailed deer across roadways and limit the potential for deer-vehicle collisions.

**Timeline:** Annual, ongoing

**Priority:** Medium

**Cost:** Covered under current operational costs

## 3.2 White-tailed Deer Population Monitoring

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### Background

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Complete population censuses of deer are typically impractical, expensive, and in many instances, impossible. Consequently, managers usually have to monitor the trends in population characteristics. These demographics generally include deer density, sex and age ratios, productivity rate, and mortality rate. Where appropriate, estimates of variance have been calculated for the aforementioned ratios and rates (Skalski et al. 2005).

From the standpoint of priority investments as well as adequately monitoring a harvested game species, it is important to know the trajectory of critical vital rates of deer populations for a given period of time. Currently, WDFW has not standardized across all zones, which metrics are most appropriate for monitoring white-tailed deer.

### Objective 3.2.1

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WDFW will develop a “white paper” that identifies new techniques and survey protocols for each of the white-tailed deer zones of Washington by January 2013. In addition the paper will identify the appropriate critical vital rates that should be monitored for white-tailed deer in Washington and provide recommendations for implementation.

#### Strategies

- Explore the primary scientific literature for information on techniques related to surveying and estimating white-tailed deer numbers and white-tailed deer vital rates.
- Contact colleagues in other states to determine what protocols other agencies are using to survey and estimate white-tailed deer.

- Convene the WDFW white-tailed deer working group and come to a group consensus on standardizing which vital rates should be monitored for white-tailed deer in Washington.
- Develop a peer reviewed white paper.

**Timeline:** January 2013

**Priority:** High

**Cost:** Covered under current operational costs

### Objective 3.2.2

---

While WDFW develops more reliable survey protocols, continue to collect current deer population metrics.

#### Strategies

- Collect age and sex ratio data and population trend indices through aerial or ground surveys, including:
  - Continue to conduct post-hunt population surveys to estimate or index population size.
  - Continue to conduct post-hunt population surveys to index buck survival through the hunt period.
  - Continue to conduct spring “green-up” surveys to determine winter survival of adults and juveniles and use this information to set special permit levels for the coming fall hunting season.
  - Continue to conduct pre-hunt surveys in the summer and early fall to measure productivity and to measure the ratio of bucks per does and the ratio of legal bucks per does.
- Collect tooth samples at check stations or via voluntary hunter submissions to generate age-at-harvest data.
- Collect hunter harvest data through mandatory hunter harvest reporting and hunter check stations.
- Modify the hunter report system survey questions to improve quality and usefulness of white-tailed deer harvest data and better evaluate white-tailed deer harvest.

**Timeline:** Annual, ongoing

**Priority:** High

**Cost:** \$120,000/yr (8 Wildlife Biologists @ 15%; \$10,000 flights)

## 3.3 White-tailed Deer Harvest Management

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### Hunting Seasons

#### Background

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Traditionally, hunting seasons for white-tailed deer in Washington have generally been set to avoid the peak November rut period, a time of higher vulnerability to buck white-tailed deer. However, white-tailed deer hunters have expressed desires for a variety of hunting opportunities, including greater chances to harvest mature bucks and antlerless white-tailed deer, maximum harvests, and maximum opportunities through later or longer seasons. Adding complexity, white-tailed deer seasons and harvest levels must be allocated among three hunter groups: archers, modern firearm hunters, and muzzleloaders.

In the current Game Management Plan (WDFW 2008), WDFW has associated four categories of hunting intensity with resultant post-hunt buck to doe ratios:

Liberal:	10 to 14 bucks: 100 does
Standard:	15 to 19 bucks: 100 does
Moderate:	20 to 24 bucks: 100 does
Conservative:	25+ bucks: 100 does

A variety of hunting opportunities are currently being offered in each white-tailed deer zone. Portions of at least one zone have already been identified as requiring improvement in the post-hunt white-tailed deer buck ratios and as such the hunting opportunities have been adjusted to improve buck escapement.

#### Objective 3.3.1

---

Continue to offer a variety of hunting season opportunities to meet population goals and maintain hunter satisfaction through 2012.

#### Strategies

- Manage buck populations to provide an antlered white-tailed deer harvest in which 15% or more of the bucks will have five or more antler points on one or both antlers.
- Continue to offer antlerless hunting opportunity where appropriate, depending upon population status and crop damage complaints.
- Explore the creation of a variety of additional hunting opportunities that provide for high success rates, low hunter density, later season hunts, and a high percentage of mature white-tailed deer bucks in select GMUs.
- Hunters will be surveyed prior to 2012 to reassess hunter satisfaction with various aspects of white-tailed deer hunting, including overall experience, available opportunity, timing of opportunity, length of opportunity, availability of legal animals to harvest, and availability of mature bucks to harvest.

- Using the vital rates that will be identified in Objective 3.2.1, develop benchmarks for given parameters that would trigger changes in hunting season structures.

**Timeline:** Annual, ongoing

**Priority:** High

**Cost:** Covered under current operational costs, except public opinion surveys which are \$5,000 to \$10,000 each

## **Predators**

### **Background**

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Wildlife managers have shown varying success with coyote control programs to increase deer population numbers. Success of such programs is dependent on the specific ecosystem, seasonality, deer density, coyote density, weather, and many other extraneous factors. The authors conducted a literature review to explore this topic (Appendix E).

### **Objective 3.3.2**

---

WDFW will determine the efficacy, cost-efficiency, and determine cost estimates of coyote control as a wildlife management tool to benefit white-tailed deer and provide those results in an agency report.

#### **Strategies**

- Work with the USDA Wildlife Services and other experts to determine the efficacy of coyote control operations at the scale and in the habitat types of the Selkirk Zone.
- Determine cost estimates of coyote control operations at the GMU scale and in the habitat types of the Selkirk Zone.
- Determine cost estimates of white-tailed deer population monitoring to assess coyote control operations.
- Implement the recommendations developed in the written report.

**Timeline:** Report by 2012

**Priority:** High

**Cost:** Covered under current operational costs

## **Private Lands Hunting Access**

### **Background**

---

Farmers, ranchers, and commercial timber companies own the majority (58%) of the white-tailed deer range in Washington, making access to these lands important in providing recreational hunting for white-tailed deer. Reduced access to private land and reduced access to public land via private land are growing concerns for Washington hunters and WDFW. White-tailed deer can cause agricultural damage concerns for producers and reduced access for hunters to these lands, exacerbates the problem. WDFW's Private Lands Access Program is designed to develop and



maintain public access to private property for the purpose of outdoor recreation, with an emphasis on hunting. It is a cooperative effort between WDFW, the U.S. Fish and Wildlife Service, private landowners, and volunteers. At the time of this writing the program has over 575 private landowners and over 1.1 million acres of private land under cooperative agreement in eastern Washington. The program will continue to maintain a base of cooperative private landowner agreements and strive to increase hunting and other outdoor recreational opportunities.

This program provides public access to private lands through a negotiated agreement between WDFW and landowners statewide. It includes four basic access agreement types:

- ***Feel Free to Hunt*** – Includes private lands where WDFW has a management agreement with the owner to provide public access for hunting in exchange for services and materials (signs) for the posting and enforcement of regulations on these lands on an open and less restrictive basis.
- ***Register to Hunt*** – Includes private lands in which WDFW has a management agreement with the owner or organization where hunting is regulated by registration. WDFW's investment related to this agreement type includes the annual sign-up of farmers, posting and changing signs as crops are harvested, continual monitoring of hunter use, and pick up and analysis of registration forms. Extensive use occurs on large circle-irrigation corporate farms.
- ***Written Permission Program*** – Includes private lands where WDFW provides information signs to those property owners who voluntarily open their land to public hunting on a contact-for-permission basis. Typical signs provided to cooperating farmers are: Hunting by Permission, Watch for Livestock, Close the Gate, and Don't Litter. This sub-program requires continual personal communication with farmers and farm groups explaining the availability and variety of signs offered. A written permission sign is provided, and permission slips for access are made available to the cooperating landowners.
- ***Landowner Hunting Permit Program*** – This program includes private lands where WDFW negotiates public hunting access to unique and/or high quality hunting opportunities. Landowners are allowed to work with WDFW to set special hunting season dates on their property and have customized hunting opportunities on their lands.

WDFW provides the public with an internet-based map with the locations of private lands open to hunting, providing landowner contact phone numbers on all Written Permission Program signs, and annual monitoring and evaluation of property use by the public.

### Objective 3.3.3

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Increase the number of acres in the Private Lands Access Program that allow white-tailed deer hunting in Stevens County by at least 5,000 acres by 2012 and maintain acreage levels in all other zones.

#### Strategies

- Expand time and effort in developing contracts with Stevens County landowners with white-tailed deer hunting opportunities and explain the various options and benefits of the Private Lands Access Program.

- Increase the number of agreements with large industrial timber landowners on road management projects where public hunting access is allowed.

**Timeline:** Annual, ongoing

**Priority:** High

**Cost:** Covered under the expanded Private Lands Access Program in 2010

## **Enforcement**

### **Background**

---

WDFW's Enforcement Program estimates that the current rate of compliance with white-tailed deer hunting rules is approximately 80 to 85%. Maintaining or improving compliance is critical to sustaining harvestable wildlife populations.

An additional important need is to improve landowner support for hunter access and assistance with deer problems.

### **Objective 3.3.4**

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WDFW will implement enforcement activities that ensure an 80% compliance rate with rules regulating hunting and harvest of white-tailed deer and emphasize patrols and efforts toward landowners participating in WDFW access programs.

#### **Strategy**

- Increase enforcement patrol activities for white-tailed deer hunting seasons if compliance rates drop below 80%.
- Increase enforcement activities for landowners participating in WDFW access programs.

**Timeline:** Annual, ongoing

**Priority:** High

**Cost:** Covered under current operational costs

## **Damage to Commercial Agricultural Crops**

### **Background**

---

WDFW is required by statute to address damage to commercial crops by deer and elk. Human populations in Washington continue to increase and encroach on wildlife habitat. White-tailed deer can and do cause damage to agricultural crops.

WDFW has a wide variety of both non-lethal and lethal methods at their disposal to help prevent, reduce, and mitigate damage by white-tailed deer. The goal of WDFW is to provide technical advice to prevent deer damage as well as resolve deer damage issues that have already occurred.

Compensation may be necessary in situations where preventative measures to address property damage are not successful or other circumstances, outside the control of the landowner or WDFW, prevent resolution of a deer damage problem.

### Objective 3.3.5

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Develop and implement an integrated wildlife conflict approach to providing relief for landowners experiencing agricultural damage by deer.

#### Strategies

- Continue to provide financial relief to landowners experiencing deer damage consistent with the Washington Administrative Code (WAC) in Chapter 232.36.
- Continue to provide or recommend materials and methods for repelling or excluding deer from properties.
- Expand opportunities to reduce deer numbers through antlerless deer harvest in the predominantly private land GMUs. Management tools such as second or multiple tags allowed per person, adjusting opening dates, longer seasons, and landowner damage prevention permits will be utilized where appropriate.

**Timeline:** Annual, ongoing

**Priority:** High

**Cost:** In 2009 for Region 1, the Enforcement staff costs related to deer and elk damage approached \$38,000. White-tailed deer are only a portion of the deer and elk damage activity which would also include elk and mule deer. This figure does not include damage payments awarded to landowners.

## 3.4 Living with White-tailed Deer

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### Deer on the Suburban Interface

#### Background

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White-tailed deer are very adaptable to the suburban/rural interface, to the point where they can readily become a nuisance to landowners and a danger to motorists. Management of white-tailed deer at the interface with human development is further complicated by the fact that more areas in and around urban/suburban communities in Washington are being classified as no shooting zones by local municipalities, which results in fewer white-tailed deer hunting opportunities. At the local level, these circumstances can develop into substantial management challenges.

#### Objective 3.4.1

---

To address this concern, WDFW will continue to work with landowners, communities, and city and county governments, annually, to limit expansion of no shooting zones and retain various forms of hunting as a management tool.

#### Strategies

- When necessary, WDFW should develop hunts that maintain deer harvests as needed in areas in or near human population centers.
- When practical, WDFW will recommend for the Fish and Wildlife Commission's approval, new Firearm Restriction Areas that still allow some forms of hunting. Creation

of new Firearm Restriction Areas is often contingent on local governments working with WDFW to avoid no shooting zones.

**Timeline:** Annual, ongoing

**Priority:** High

**Cost:** Covered under current operational costs

## **Baiting**

### **Background**

---

Although legal, the level and impacts of hunting white-tailed deer over bait or other attractants are unknown. Using bait to hunt white-tailed deer is very popular with some hunters and deemed inappropriate by others. When WDFW has conducted public opinion surveys on this topic the response has always been split, with a slight majority in favor of retaining the option to use bait for deer hunting. WDFW currently does not collect data to determine what effects hunting over bait may be having on white-tailed deer populations. Concerns about baiting include habitat impacts that may result from congregating deer, increasing the possibility of disease transmission, various toxins that might be associated with old or spoiled bait materials, and influencing hunter success rates and overall harvest structure.

### **Objective 3.4.2**

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Working through the public process WDFW will reevaluate the hunting of deer over bait by 2012 and share those results with the public as part of the next three-year package process.

### **Strategies**

- Evaluate the current state of knowledge of hunting deer over bait in North America.
- As part of the public process, monitor the social tolerance of hunting white-tailed deer over bait.

**Timeline:** This topic will be part of the 2012-2014 hunting season three-year package process

**Priority:** High

**Cost:** Covered under current operational costs

## **Damage to Residential/Commercial Landscaping**

### **Background**

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Private lands in Washington support large numbers of white-tailed deer in various parts of the state. These populations periodically cause damage to agricultural crops and residential landscaping. The diverse attitudes and goals of private landowners can create refugia for white-tailed deer in some areas, which can limit effective deer management. By their very nature, urban and suburban neighborhoods also create refuges that prohibit or negate many management strategies. In addition some urban/suburban landowners recreationally feed and view deer, while their neighbors incur landscaping and garden damage by the same deer. Large numbers of deer in or near

urban/suburban developments can also create hazards for motorists. Habituated deer can also be a nuisance and occasionally a potential public safety issue.

### Objective 3.4.3

---

As issues arise, utilize the stakeholder group process to develop integrated and localized deer management approaches to providing relief for landowners experiencing problems with nuisance deer affecting non-agricultural plantings and property.

#### Strategies

- Encourage stakeholders to form organized groups to develop consensus on solutions to problems.
- Produce and/or purchase brochures that summarize information on successfully co-existing with white-tailed deer (Link, 2004). All County Extension Services and Fish and Wildlife offices will be provided brochures for distribution.
- WDFW will continue to provide consultation and recommendations to entities seeking information.

**Timeline:** Annual, ongoing; Living with Wildlife brochures by 2012

**Priority:** Medium

**Cost:** Covered under current operational costs. Brochures \$5,000 to \$10,000

## Dog and Deer Conflicts

### Background

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Dog owners who let their pets roam freely across white-tailed deer habitat create problems for deer, particularly during the spring and winter when fawns are especially vulnerable. Free-ranging dogs chase and harass deer when deep snow makes movement and escape difficult, increasing deer energy expenditures when energy stores may be critical for winter survival. Domestic dogs have been known to run down, capture, and kill adult deer during the winter and young fawns during the spring. By state law, a person is guilty of unlawful use of dogs if they negligently fail to prevent a dog under the person's control from pursuing or injuring deer. Unlawful use of dogs is a misdemeanor. A dog that is the basis for such a violation may be declared a public nuisance (see Appendix C for statutes related to dogs harassing wildlife).

### Objective 3.4.4

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Develop an education/outreach plan to address domestic dogs harassing and/or killing deer.

#### Strategy

- Develop and implement a plan for educating the public on the problems free-ranging domestic dogs create for deer by using WDFW's "Living with Wildlife" series.
- Contact County Governments without prohibitions on free ranging dogs and encourage them to adopt and enforce ordinances which protect deer and other wildlife from free ranging dogs.

**Timeline:** Completed by 2015

**Priority:** Medium

**Cost:** Covered under current operational costs except for outreach materials which could cost as much as \$20,000

## **3.5 Emergency Feeding of Deer**

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### **Winter Feeding**

#### **Background**

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White-tailed deer populations, harvest, and weather will vary from year to year throughout the state. Fortunately only the occasional “bad winter” produces extreme snow depths, prolonged low temperatures, and poor animal body condition that results in widespread winter mortality in Washington’s white-tailed deer populations.

Feeding during winter concentrates white-tailed deer in unsuitable areas, facilitates spread of disease, and promotes the unrealistic expectation that white-tailed deer populations can be maintained without regard to the limits of the habitat. However, there are times when unusual weather patterns may create critical periods of stress when winter forage becomes limited, unavailable, or animals are forced into areas where public safety becomes an issue. WDFW discourages the practice of recreational feeding of deer but despite the policy, deer are frequently fed by the public.

WDFW’s emergency winter feeding policy provides for circumstances when supplemental feeding of deer is authorized (Appendix D). Those circumstances include:

- To prevent and/or reduce deer or elk damage to private property (agricultural or horticultural crops).
- To support a WDFW management plan.
- To respond to an emergency as determined by the Director or the Director's designee.
- To allow for the regeneration of winter habitat that has been severely damaged or destroyed by disaster, such as fire or drought.
- For WDFW approved wildlife research or wildlife capture.
- In areas or times where hunting seasons have closed.

#### **Objective 3.5.1**

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Minimize feeding of white-tailed deer that is not consistent with WDFW’s Winter Feeding Policy.

#### **Strategies**

- Develop and implement a plan for educating the public on the problems created by winter feeding white-tailed deer by using WDFW’s “Living with Wildlife” series.

- Continue to work with the appropriate land management agencies or landowners in an effort to maintain winter ranges in a condition suitable to meet white-tailed deer management objectives.
- Continue to discourage private feeding of white-tailed deer for recreational purposes.
- Emergency winter-feeding by WDFW will be conducted in accordance with established policies and statutes.

**Timeline:** Annual, ongoing; education plan by 2015

**Priority:** Low

**Cost:** Covered under current operational costs

### **3.6 Diseases Affecting White-tailed Deer**

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#### **Background**

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Chronic wasting disease (CWD), tuberculosis (TB), blue tongue (BT), and epizootic hemorrhagic disease (EHD) are the primary diseases of national concern in white-tailed deer. All of these diseases have the potential for major impacts to deer populations and their management (Davidson 1981).

Of these diseases, only BT and EHD have been documented in white-tailed deer in Washington. WDFW, in partnership with the USDA, has developed a large scale monitoring program to survey for the presence of CWD within Washington. Aside from CWD, information is generally lacking on exposure and importance of these and other diseases to Washington's white-tailed deer. Hair-loss caused by heavy louse infestations is a potentially newly emerging issue for white-tailed deer that will be tracked and monitored by WDFW. To date there have been no confirmed cases of hair loss caused by exotic lice in white-tailed deer but there have been cases confirmed for both mule deer and black-tailed deer.

#### **Objective 3.6.1**

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Continue monitoring and documenting presence and prevalence of important diseases affecting white-tailed deer. Report on those findings annually.

#### **Strategies**

- Opportunistic biological samples (sera, fecal, hair, tissue, external parasites) will be collected from white-tailed deer when animals are captured and handled by WDFW personnel.
- When feasible, biological samples will be collected and necropsies will be performed on white-tailed deer that appear ill or evidence suggests they may have died from disease.
- Continue to monitor for CWD in white-tailed deer, especially in those high risk locations along state borders where captive deer and elk operations exist in neighboring states.
- Continue to prohibit importation of live white-tailed deer from outside the state and enforce the rules that disallow the ownership of captive white-tailed deer within the state.

- Begin monitoring for the prevalence of hair loss and lice infestations among white-tailed deer in Washington.
- Where lice are implicated in white-tailed deer hair loss, WDFW will identify which species of lice are involved.

**Timeline:** Annual, ongoing

**Priority:** Medium

**Cost:** Covered under current operational costs



# Chapter 4: Research & Information Needs

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## 4.1 Population Estimation

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### Background

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Primary components of effective management of harvested populations is reliable information on the number of animals that are on a given landscape, a specific harvest goal to be taken from that population, and the population response to the harvest and other exogenous factors (i.e., winter, drought, disease, land use practices) (Caughley 1977, McCullough 1979, 1984, 1987, 2001, DeYoung 1990, Fryxell et al. 1991). Reliably estimating population size is extremely challenging and typically expensive; as a result management decisions are often made with indices or surrogates of population size (Skalski et al. 2005).

The secretive nature of white-tailed deer and the habitats they occupy make it difficult to accurately estimate population size and composition. Managers rarely know all of the population dynamic details that exist for a given game animal population in a specific location. Robust population estimation techniques that include a formal assessment of the uncertainty associated with the estimates are required for informed and defensible management strategies.

### Objective 4.1.1

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If funding becomes available, initiate a project to improve WDFW's ability to estimate important parameters associated with white-tailed deer populations.

### Strategies

- Implement existing or develop new population estimation techniques that can be successfully used in one or more of the white-tailed deer zones in Washington.

## 4.2 Survival, Mortality, Recruitment, and Age Structure of Populations

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### Background

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Current knowledge and management of white-tailed deer populations in Washington is based upon various population and management indices; these include age and sex composition, harvest age structure based on teeth inspected/collected from hunter-killed deer at check stations, and estimated harvest. Information is limited on population-level buck and doe age structure, population growth rate, recruitment, survival, body condition dynamics, and reproductive potential.

Knowledge of mortality patterns in white-tailed deer populations helps better structure management strategies. Identifying mortality levels, causes, and seasonal timing help managers make decisions about best management practices. Tracking changes in other sources of mortality besides hunting, such as cougar or coyote predation may be equally important. Similarly, it is also important to know the effects of harvest strategies on buck age structure in the population (Rosenberry and Woolf 1991). These population parameters will become increasingly important as

wolves become established within white-tailed deer range. How wolves will insert themselves into this complex predator-prey dynamic has yet to be determined. In other parts of North America where white-tailed deer and wolves overlap, white-tailed deer are an important prey source for wolves. A similar predator-prey link will likely be established in Washington as well.

### **Objective 4.2.1**

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If funding becomes available, initiate a project to improve WDFW's ability to measure vital rates of both sexes and multiple age classes of one or more white-tailed deer populations in the Selkirk Zone.

#### **Strategies**

- Measure mortality rates and mortality causes within multiple GMUs in the Selkirk Zone.
- The same project would also investigate other aspects of white-tailed deer natural history including sex ratios, age structure, population growth rates, timing of the rut, and productivity within multiple GMUs.
- The project would measure hunter-harvest effects on age structure of white-tailed deer herds within multiple GMUs.
- Design monitoring protocols to help establish the link between harvest data and white-tailed deer population dynamics.

## **4.3 White-tailed Deer Movements and Resource Selection**

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### **Background**

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Knowledge of herd boundaries, seasonal movement patterns, migration corridors, and habitat use by white-tailed deer is fundamental to managing deer populations, harvest, and the habitats upon which deer depend (Owens 1981). Herd boundary delineations provide the basic unit for population and harvest management. Information on seasonal movement patterns and habitat use allows deer managers to identify critical areas such as fawning areas, winter ranges, spring green-up ranges, fall use areas, and migration corridors. Similarly, such knowledge provides deer managers and others the ability to protect critical use areas and/or enhance the quality of these ranges for white-tailed deer.

### **Objective 4.3.1**

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If funding becomes available, initiate a project to improve WDFW's knowledge of white-tailed deer herd boundaries, seasonal movements, home range characteristics (e.g., size, location), and habitat use patterns in the Selkirk Zone.

#### **Strategies**

- Determine the use of critical habitats by white-tailed deer, as well as the distribution and movements of radio marked deer within multiple GMUs.
- Investigate white-tailed deer habitat use among farm and forest mosaics, contiguous forest dominated landscapes, and other habitat associations.
- Compare and contrast white-tailed deer density among farm and forest mosaics, contiguous forest dominated landscapes, and other habitat associations.

- Identify important seasonal movement patterns, corridors, and migration routes.

## **4.4 White-tailed Deer Harvest Management Assessments**

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### **Background**

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As discussed in Chapter 3, hunting opportunity for white-tailed deer in Washington has traditionally been set to avoid the breeding season, a time of higher vulnerability for bucks. White-tailed deer hunters continue to press for more and diverse hunting opportunities, including greater chances to harvest mature bucks, more opportunities for antlerless harvest, and more overall opportunities through later or longer seasons (Strickland et al. 2001, Jenks et al. 2002).

Availability of mature bucks is a prominent concern of some white-tailed deer hunters nationally. This concern about mature bucks may be tied to the emergence of the Quality Deer Management (QDM) concept in the eastern United States where buck mortality from hunting is high, and deer numbers often exceed carrying capacity (Miller and Marchington 1995, Brothers and Ray 1998). High doe harvests are often used in many of these areas to reduce deer densities. Sometimes antler point restrictions have been used in an attempt to produce older age class bucks without restricting hunter numbers. Such a strategy can reduce hunter success rates for bucks, but in some cases may improve buck escapement, at least for younger bucks. In Washington, in areas where buck escapement was an issue and deer populations were not meeting post-hunt population objectives for bucks, WDFW has implemented both antler restrictions and shorter hunting seasons to improve buck survival. The ongoing debate over such management practices continues among both deer managers and deer hunters. Critics argue that more hunting pressure is put on older age-class bucks, the same group of deer that hunters want to see increased. Advocates counter that antler restrictions or antler restrictions in conjunction with shorter hunting seasons allow enough buck survival to meet post-hunt population objectives for the buck sub-population.

Similar harvest management strategies have been implemented for some eastern Washington white-tailed deer populations and proposed for other populations that currently do not have antler point restrictions. Hunts with antler point restrictions for white-tailed bucks have been controversial in Washington, because the effects on Washington white-tailed deer population dynamics are not adequately understood. Management experiments exploring alternative harvest strategies that include alternate season timing, antler point restrictions, weapon choice, and/or antlerless harvests at various levels, implemented in select deer areas or GMUs would provide an opportunity to evaluate effects of these strategies on deer populations and hunter satisfaction.

### **Objective 4.4.1**

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If funding becomes available, initiate a project to increase understanding and provide new knowledge of current and alternative white-tailed deer harvest strategies.

#### **Strategies**

- Model the effects of different harvest strategies on vital rates, buck age-structure, and antler point configurations.
- Develop and implement management experiments to explore harvest strategies under a control vs. treatment design to evaluate effects on white-tailed deer vital rates, buck age-structure, and average antler development.

# Chapter 5: Spending Priorities

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The following priority investments are needed to implement the Washington White-tailed Deer Management Plan:

## HABITAT AND ACCESS - High Priority

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At least within the Selkirk and Okanogan Highlands Zones, the loss of farmland acreage devoted to cereal grain and alfalfa hay production has probably had an overwhelming influence in the decline of white-tailed deer since the 1980s. Collaborations among WDFW, private farm landowners, the Federal Natural Resources Conservation Service, the U.S. Forest Service, and other partners to enhance large tracts of former farm land through restoration of active farming and/or development of food plots could increase the carrying capacity for white-tailed deer. In addition, WDFW and its public partners should promote forest practices on timberland within the farm-forest landscape mosaic to improve white-tailed deer forage and cover.

### Objective 3.1.1 Habitat Management on WDFW Lands:

Implement 6 projects to maintain and enhance white-tailed deer habitat on WDFW lands.

### Objective 3.1.2 White-tailed Deer Habitat on Private Lands:

Increase the number of contracts with private landowners regarding participation in white-tailed deer habitat enhancement projects by 12, annually.

### Objective 3.3.3 Private Lands Hunting Access:

Increase the number of acres in the Private Lands Access Program that are amenable to white-tailed deer hunting by at least 5,000 acres by 2016.

**Timeline:** Immediate and ongoing

**Cost:** \$70,000/yr (1 Private Lands Biologist [FW Bio 2])  
\$40,000 for landowner incentives to enhance white-tailed deer forage

## POPULATION AND HARVEST MANAGEMENT - High Priority

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Conducting a census of a white-tailed deer population is often impractical, expensive, and rarely possible. Managers typically use sample data drawn from the population in question to monitor trends in population demographics. The parameters estimated from these sample data include deer density, sex and age ratios, productivity, and mortality.

### Objectives 3.2.1 and 3.2.2 White-tailed Deer Population Monitoring:

While WDFW evaluates reliable survey protocols; continue to collect current deer population metrics.

**Timeline:** Ongoing

**Cost:** \$120,000/yr (8 Wildlife Biologists @ 15%, + \$20,000 in flights)

White-tailed deer hunters have expressed the desire for a variety of hunting opportunities, including greater chances to harvest mature bucks, greater chances to harvest antlerless white-tailed

deer, management that maximizes harvest, and hunting seasons that maximize opportunities through later or longer seasons.

**Objective 3.3.1 Hunting Seasons:**

Continue to offer a variety of hunting season opportunities

**Timeline:** Ongoing

**Cost:** \$42,000/yr (11 Wildlife Biologists @ 5%)

## **RESEARCH AND MANAGEMENT ASSESSMENT - High Priority**

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### **Population Estimation**

If funding becomes available, improve and expand the existing survey protocols for white-tailed deer. More accurate and efficient ways to index white-tailed deer abundance, density, and sex and age ratios should be explored and developed to increase management effectiveness and efficiency.

Annual pre-season composition surveys are one of the most important activities that WDFW conducts to monitor deer populations. Pre-hunting season composition surveys supply important data to help monitor fawn recruitment, mortality rates, and the level of antlerless harvest that the population can sustain. Estimates of these rates must be relatively unbiased and precise to assess the success of various deer harvest strategies, and document the effect of recreational and tribal harvest.

Standardization of survey protocols throughout the most important zones where white-tailed deer are hunted should also be a priority. Survey funding levels need to be substantially increased to meet these needs.

**Objective 4.1.1 Population Estimation:**

Improve WDFW's ability to estimate important parameters associated with white-tailed deer populations

**Timeline:** Begin When Funding Becomes Available

**Cost:** \$250,000/yr

### **Natural History and Habitat Selection**

Little is known about the life history, population dynamics, habitat selection, and movements of white-tailed deer in Washington State. A peer-reviewed study proposal to better understand the ecology of white-tailed deer within eastern Washington should be developed.

Research issues to address would include at least the following: development of improved approaches to estimating population parameters identified in Objective 3.2.1, white-tailed deer population dynamics, habitat selection, and movement patterns.

**Objective 4.2.1 Survival, Mortality, Recruitment, and Age Structure of Populations:**

Improve WDFW's ability to measure vital rate of both sexes and multiple age classes of one or more white-tailed deer populations in the Selkirk Zone.

**Objective 4.3.1 White-tailed Deer Movements and Resource Selection:**

Improve WDFW's knowledge of home range characteristics and habitat use patterns for white-tailed deer in the Selkirk Zone.

**Objective 4.4.1 White-tailed Deer Harvest Management Assessments:**

Increase understanding and provide new knowledge of current and alternative white-tailed deer harvest strategies.

**Timeline:** Begin FY 2011 complete by FY 2016

**Cost:** Combined with Objective 4.1.1 for a total of \$280,000/yr

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**HUMAN & WHITE-TAILED DEER CONFLICTS - Medium Priority**

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WDFW is required by statute to address damage to commercial crops by white-tailed deer. White-tailed deer can and do cause damage to agricultural crops.

WDFW has a wide variety of non-lethal and lethal methods to help prevent, reduce, and mitigate damage by white-tailed deer. The goal of WDFW is to provide technical advice to prevent deer damage as well as resolve deer damage issues that have already occurred. Compensation will be used to provide landowners greater assistance and encourage tolerance for white-tailed deer.

**Objective 3.4.1 Human-White-tailed Deer Conflicts:**

Reduce the incidence of human-white-tailed deer conflicts.

**Timeline:** Immediate and ongoing

**Cost:** \$38,000 for deer and elk combined in Region 1.  
\$40,000 for expanded work in the Selkirk Zone.

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**DISEASES - Medium Priority**

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Chronic wasting disease (CWD), tuberculosis (TB), blue tongue (BT), and epizootic hemorrhagic disease (EHD) are the primary diseases of national concern in white-tailed deer. Only BT and EHD have been documented in white-tailed deer in Washington. WDFW has developed a monitoring program to survey for the presence of CWD. No CWD detections have been made to date. Information is generally lacking on prevalence and population effects of diseases to Washington's white-tailed deer. Hair-loss caused by heavy louse infestations is a newly emerging issue for white-tailed deer that will be tracked and monitored by WDFW.

**Objective 3.6.1 Diseases Affecting White-tailed Deer:**

Continue monitoring presence and prevalence of important diseases affecting white-tailed deer.

**Timeline:** Immediate and ongoing

**Cost:** \$50,000

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## **Appendix A Washington Department of Fish and Wildlife Hunting Season Guidelines**

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Hunting seasons and regulation recommendations should be based on good science. When biological information is lacking or insufficient, management decisions should be conservative to ensure protection of wildlife resources. At no time should decisions favor income to the agency or recreation over protection of wildlife populations.

1. In general, hunting seasons and game management units should be easy to understand while maintaining hunting opportunity and management options.
2. Continuity in hunting seasons over time is highly valued by the public, therefore Department recommendations for significant changes to seasons should be based on resource or management need.
3. Hunting season establishment shall be consistent with the Hunting Co-Management Guidelines between WDFW and Tribes.
4. Hunting seasons should be consistent with species planning objectives and provide maximum recreation days while achieving population goals.
5. A three year season setting process should be maintained which will provide consistent general seasons from year to year with annual changes in permit levels to address emergent resource concerns; natural disasters; and to meet requirements of federal guideline changes; etc.
6. Substantial public involvement and timely opportunity to comment must be provided for 3-year season recommendations and must be in compliance with the state's Regulatory Reform Act.
7. Public involvement for annual permit season setting shall include at a minimum, a standard written comment period and one public meeting where comments will be considered.
8. Provide separate deer and elk general season recreational opportunities for archers, muzzleloaders, and modern firearm hunters.
9. Special deer and elk permit hunt opportunities shall be allocated among three principal user groups (archery, muzzleloader and modern firearm) using the approved formula of success/participation rate.
10. Weapon and hunting equipment restrictions should be easy to understand and enforce, maintain public safety, protect the resource, and allow wide latitude for individuals to make equipment choices.
11. Enhanced general season considerations, special access opportunities, and other special incentives should be developed for disabled, Master Hunter program graduates, youth, and hunters 65 and older rather than special permit hunts. Master Hunter incentives should return to the program's original intent, which was to address private lands, and associated hunter ethics issues. Disabled hunter opportunities should emphasize equal access consistent with the Americans with Disabilities Act.

12. Private landowner hunting issues such as season length, damage control, and trespass should be given consideration when developing hunting season recommendations.
13. Standardize furbearer regulations that provide trapping opportunity and address damage control.
14. Establish migratory bird and small game regulations to provide maximum hunting opportunity considering federal guidelines, flyway management plan elements, and Department management objectives.
15. Hunting season closures and firearm restrictions should be based on resource conservation and public safety.
16. Maintain a high quality goat, sheep, and moose permit hunting opportunity consistent with resource availability.

**Appendix B.1 Summary of general and permit deer hunter numbers, days hunted, harvest success, and hunters per square mile by method of hunting within the Selkirk Zone, 2001-2008.**

			2001							2002						
GMU	Square Miles	Weapon	No.	No.	Days Hunted	Harvest General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.	No.	No.	Days Hunted	Harvest General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.
			Hunters General	Hunters: Permit						Hunters General	Hunters: Permit					
105	296	Archery	79	0	568	14	0	18	0.27	104	1	781	23	0	22	0.35
105	296	Modern Firearm	1,496	124	6,527	345	68	25	5.47	1,561	183	7,128	334	79	24	5.89
109	743	Archery	70	0	410	18	0	26	0.09	100	0	622	31	0	31	0.13
109	743	Modern Firearm	2,732	295	13,810	714	145	28	4.07	2,804	338	14,952	666	136	26	4.23
109	743	Muzzleloader	192	10	703	81	4	42	0.27	312	6	1,131	120	0	38	0.43
113	736	Archery	68	1	402	9	0	13	0.09	80	0	536	10	0	13	0.11
113	736	Modern Firearm	1,938	61	9,972	386	16	20	2.72	1,801	66	9,761	345	7	19	2.54
113	736	Muzzleloader	491	9	2,248	182	0	36	0.68	668	9	3,440	112	0	17	0.92
117	954	Archery	355	0	2,406	102	0	29	0.37	422	0	2,822	66	0	16	0.44
117	954	Modern Firearm	4,113	218	20,966	922	67	23	4.54	3,953	258	20,619	923	89	24	4.41
117	954	Muzzleloader	230	4	716	101	0	43	0.25	324	8	1,153	98	0	30	0.35
121	796	Archery	412	2	2,397	155	0	37	0.52	479	1	3,238	115	0	24	0.6
121	796	Modern Firearm	6,162	454	30,373	1,671	191	28	8.31	6,525	781	32,355	1,683	344	28	9.18
121	796	Muzzleloader	0	1		0	0	0	0.00	0	6		0	1	17	0.01
124	771	Archery	683	0	5,104	291	0	43	0.89	829	2	6,457	235	0	28	1.08
124	771	Modern Firearm	5,522	663	27,597	1,468	259	28	8.02	5,105	512	26,304	1,446	206	29	7.29
124	771	Muzzleloader	138	40	446	50	24	42	0.23	209	47	781	50	21	28	0.33

			2003							2004						
GMU	Square Miles	Weapon	No.	No.	Days Hunted	Harvest General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.	No.	No.	Days Hunted	Harvest General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.
			Hunters General	Hunters: Permit						Hunters General	Hunters: Permit					
105	296	Archery	96	0	604	30	0	31	0.32	112	4	581	19	1	17	0.39
105	296	Modern Firearm	1,345	109	6,148	381	54	30	4.91	1,680	123	7,181	429	43	26	6.09
108	289	Archery	40	0	231	9	0	23	0.14	44	0	183	12	0	27	0.15
108	289	Modern Firearm	1,275	159	6,221	387	88	33	4.96	1,343	188	5,562	436	110	36	5.3
108	289	Muzzleloader	75	1	280	25	0	33	0.26	73	0	241	28	0	38	0.25
111	454	Archery	34	0	265	8	0	24	0.07	46	0	275	11	0	24	0.1
111	454	Modern Firearm	1,277	91	6,600	337	47	28	3.01	1,552	77	7,164	454	31	30	3.59
111	454	Muzzleloader	139	2	597	48	0	34	0.31	184	4	622	62	0	33	0.41
113	736	Archery	59	0	352	9	0	15	0.08	107	0	582	23	0	21	0.15
113	736	Modern Firearm	1,807	56	9,482	427	16	24	2.53	1,811	52	8,457	437	20	25	2.53
113	736	Muzzleloader	628	13	2,932	178	0	28	0.87	768	12	3,199	161	0	21	1.06
117	954	Archery	401	2	2,678	101	0	25	0.42	517	7	3,025	125	0	24	0.55
117	954	Modern Firearm	3,761	199	19,171	1,056	82	29	4.15	4,167	219	19,705	1,275	113	32	4.6
117	954	Muzzleloader	247	7	952	77	0	30	0.27	256	4	794	65	0	25	0.27
121	796	Archery	519	10	3,312	150	1	29	0.66	633	13	3,428	184	1	29	0.81
121	796	Modern Firearm	6,155	633	30,115	1,870	335	32	8.53	6,796	511	30,285	2,220	248	34	9.18
121	796	Muzzleloader	206	14	679	93	1	43	0.28	254	11	729	111	1	42	0.33
124	771	Archery	903	44	6,998	311	14	34	1.23	1,114	52	7,462	331	6	29	1.51
124	771	Modern Firearm	5,105	523	26,528	1,597	224	32	7.30	5,876	496	27,812	1,901	230	33	8.26
124	771	Muzzleloader	253	61	923	67	23	29	0.41	291	49	944	59	17	22	0.44

GMU	Square Miles	Weapon	2005							2006						
			No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.	No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.
			105	296	Archery	109	0	708	29	0	27	0.37	143	13	935	36
105	296	Modem Firearm	1,332	117	5,729	400	62	32	4.90	1,593	101	6,815	473	73	32	5.72
105	296	Muzzleloader	0	1		0	0	0	0.00	32	1	106	8	0	24	0.11
108	289	Archery	40	0	165	11	0	28	0.14	103	9	602	27	4	28	0.39
108	289	Modem Firearm	1,142	184	4,996	360	101	35	4.59	1,252	142	5,337	416	119	38	4.82
108	289	Muzzleloader	66	7	207	24	0	33	0.25	43	1	132	18	0	41	0.15
111	454	Archery	33	0	214	10	0	30	0.07	50	0	222	12	0	24	0.11
111	454	Modem Firearm	1,321	76	6,495	394	33	31	3.08	1,541	77	7,932	460	37	31	3.56
111	454	Muzzleloader	142	1	550	60	0	42	0.31	117	0	470	36	0	31	0.26
113	736	Archery	87	2	469	23	0	26	0.12	88	0	474	16	0	18	0.12
113	736	Modem Firearm	1,703	62	8,212	415	17	24	2.40	1,789	53	8,771	459	17	26	2.5
113	736	Muzzleloader	541	10	2,627	198	0	36	0.75	684	20	2,963	245	0	35	0.96
117	954	Archery	444	10	2,989	114	0	25	0.48	546	17	3,638	168	0	30	0.59
117	954	Modem Firearm	3,872	250	18,363	1,234	109	33	4.32	4,530	310	21,438	1,383	158	32	5.07
117	954	Muzzleloader	218	19	751	81	0	34	0.25	248	10	918	76	0	29	0.27
121	796	Archery	578	71	3,694	184	30	33	0.82	701	89	4,899	194	55	32	0.99
121	796	Modem Firearm	6,365	784	28,634	2,132	414	36	8.98	6,789	736	30,879	2,111	477	34	9.45
121	796	Muzzleloader	286	52	843	118	29	43	0.42	288	46	914	91	39	39	0.42
124	771	Archery	1,102	128	7,837	389	46	35	1.60	1,377	187	9,809	448	117	36	2.03
124	771	Modem Firearm	5,453	769	25,841	1,940	408	38	8.07	6,129	696	28,786	2,014	498	37	8.85
124	771	Muzzleloader	229	63	680	61	29	31	0.38	278	58	933	61	47	32	0.44

GMU	Square Miles	Weapon	2007							2008						
			No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.	No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.
			105	296	Archery	164	19	1,119	35	7	23	0.62	144	10	1,386	28
105	296	Modem Firearm	1,362	106	6,038	365	42	28	4.96	1,481	39	6,990	423	13	29	5.14
105	296	Muzzleloader	48	0	205	16	0	33	0.16	60	0	257	16	0	27	0.2
108	289	Archery	122	20	821	34	13	33	0.49	82	9	662	30	6	40	0.31
108	289	Modem Firearm	1,279	194	5,378	321	108	29	5.10	1,229	42	5,851	354	13	29	4.4
108	289	Muzzleloader	46	0	132	14	0	30	0.16	43	0	167	13	0	30	0.15
111	454	Archery	76	1	475	13	0	17	0.17	82	0	701	17	0	21	0.18
111	454	Modem Firearm	1,508	108	7,347	393	32	26	3.56	1,549	26	8,238	391	9	25	3.47
111	454	Muzzleloader	123	0	498	36	0	29	0.27	113	2	474	22	0	19	0.25
113	736	Archery	115	1	702	11	0	9	0.16	108	0	805	12	0	11	0.15
113	736	Modem Firearm	1,668	65	8,190	331	7	20	2.35	1,750	11	9,040	320	0	18	2.39
113	736	Muzzleloader	697	21	3,425	141	0	20	0.98	646	18	3,452	108	0	16	0.9
117	954	Archery	562	25	3,952	147	0	25	0.62	626	7	5,261	143	3	23	0.66
117	954	Modem Firearm	4,174	289	20,486	1,080	121	27	4.68	4,217	96	22,055	1,093	30	26	4.52
117	954	Muzzleloader	260	14	974	63	0	23	0.29	239	8	898	72	0	29	0.26
121	796	Archery	703	145	5,139	167	76	29	1.07	618	47	5,155	182	20	30	0.84
121	796	Modem Firearm	6,286	787	29,589	1,607	426	29	8.89	5,978	228	30,668	1,785	116	31	7.8
121	796	Muzzleloader	275	36	888	70	28	32	0.39	298	13	1,046	114	6	39	0.39
124	771	Archery	1,371	268	10,356	383	156	33	2.13	1,466	74	13,196	494	36	34	2
124	771	Modem Firearm	5,659	820	27,435	1,699	491	34	8.40	5,664	387	28,872	2,101	236	39	7.85
124	771	Muzzleloader	252	71	915	62	44	33	0.42	221	39	753	77	32	42	0.34

**Appendix B.2 Summary of general and permit deer hunter numbers, days hunted, harvest success, and hunters per square mile by method of hunting within the Palouse Zone, 2001-2008.**

GMU	Square Miles	Weapon	2001						2002							
			No. Hunters General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success / Sq. Mi.	Hunters	No. Hunters General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success / Sq. Mi.	Hunters
			127	509	Archery	287	1	2,048	111	0	39	0.57	310	1	2,574	98
127	509	Modern Firearm	1,430	97	6,620	365	40	27	3.00	1,369	86	6,436	401	36	30	2.86
130	940	Archery	107	0	761	29	0	27	0.11	138	0	994	31	0	22	0.15
130	940	Modern Firearm	1,285	140	5,434	327	64	27	1.52	1,377	150	5,616	392	74	31	1.62
130	940	Muzzleloader	393	6	2,124	165	0	41	0.42	584	14	3,237	159	1	27	0.64
133	555	Archery	96	0	591	27	0	28	0.17	126	0	706	32	0	25	0.23
133	555	Modern Firearm	1,875	344	6,853	438	210	29	4.00	1,933	386	7,715	498	221	31	4.18
133	555	Muzzleloader	78	19	241	28	8	37	0.17	140	20	503	32	7	24	0.29
139	1327	Archery	53	0	395	7	0	13	0.04	69	0	439	15	0	22	0.05
139	1327	Modern Firearm	1,846	203	7,036	655	95	37	1.54	1,964	295	7,156	653	175	37	1.7
139	1327	Muzzleloader	155	6	653	64	4	42	0.12	197	9	840	48	2	24	0.16
142	774	Archery	65	1	400	20	0	30	0.09	74	1	556	14	0	19	0.1
142	774	Modern Firearm	2,005	247	6,049	784	103	39	2.91	2,417	402	7,457	807	240	37	3.64
142	774	Muzzleloader	65	6	209	33	2	49	0.09	93	4	305	34	0	35	0.13
145	357	Archery	39	0	172	5	0	13	0.11	56	1	279	7	0	12	0.16
145	357	Modern Firearm	1,413	553	4,032	429	341	39	5.51	1,399	526	4,063	342	354	36	5.39
145	357	Muzzleloader	35	9	118	14	3	39	0.12	42	5	137	23	2	53	0.13
149	1421	Archery	72	0	426	23	0	32	0.05	84	1	516	34	0	40	0.06
149	1421	Modern Firearm	1,969	561	5,994	527	318	33	1.78	2,068	534	6,351	631	292	35	1.83
149	1421	Muzzleloader	78	18	245	28	2	31	0.07	171	24	609	57	7	33	0.14

GMU	Square Miles	Weapon	2003						2004							
			No. Hunters General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success / Sq. Mi.	Hunters	No. Hunters General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success / Sq. Mi.	Hunters
			127	509	Archery	358	27	2,505	133	3	35	0.76	350	20	2,504	93
127	509	Modern Firearm	1,349	166	6,280	377	72	30	2.98	1,500	175	6,516	446	62	30	3.29
127	509	Muzzleloader	0	2		0	0	0	0.00	0	1	0	0	0	0	0
130	940	Archery	117	1	739	29	0	25	0.13	162	4	912	25	0	15	0.18
130	940	Modern Firearm	1,323	162	5,408	399	82	32	1.58	1,409	147	5,543	384	67	29	1.66
130	940	Muzzleloader	595	19	2,984	211	0	34	0.65	637	16	2,884	219	0	34	0.69
133	555	Archery	143	0	814	34	0	24	.26	187	2	906	67	0	35	0.34
133	555	Modern Firearm	1,926	347	7,507	531	228	33	4.10	2,234	333	8,119	576	211	31	4.63
133	555	Muzzleloader	125	4	449	53	0	41	0.23	174	4	531	69	0	39	0.32
139	1327	Archery	45	3	329	12	0	25	0.04	79	0	410	22	0	28	0.06
139	1327	Modern Firearm	1,961	242	7,464	716	146	39	1.66	2,072	255	7,942	620	151	33	1.75
139	1327	Muzzleloader	175	7	751	72	0	40	0.14	207	4	795	69	0	33	0.16
142	774	Archery	60	6	443	11	1	18	0.09	75	2	354	11	1	16	0.1
142	774	Modern Firearm	2,491	397	7,680	715	197	32	3.73	2,459	265	7,951	650	125	28	3.52
142	774	Muzzleloader	191	34	665	60	14	33	0.29	204	16	614	47	6	24	0.28
145	357	Archery	41	0	236	6	0	15	0.11	44	0	161	10	0	23	0.12
145	357	Modern Firearm	1,347	535	3,904	280	340	33	5.27	1,111	322	3,100	222	171	27	4.01
145	357	Muzzleloader	52	2	164	18	0	33	0.15	73	1	193	21	0	28	0.21
149	1421	Archery	98	1	652	22	0	22	0.07	105	2	487	24	0	22	0.08
149	1421	Modern Firearm	2,119	581	6,695	604	342	35	1.90	2,084	447	6,391	455	213	26	1.78
149	1421	Muzzleloader	226	30	799	92	5	38	0.18	378	24	1,108	124	6	32	0.28

GMU	Square Miles	Weapon	2005							2006						
			No. Hunters:		Days Hunted	Harvest:		Hunter Success	Hunters / Sq. Mi.	No. Hunters:		Days Hunted	Harvest:		Hunter Success	Hunters / Sq. Mi.
			General	Permit		General	Permit			General	Permit					
127	509	Archery	355	38	2,506	129	7	35	0.77	519	53	3,511	169	35	36	1.12
127	509	Modern Firearm	1,401	247	6,313	420	116	33	3.24	1,406	310	4,913	247	188	25	3.37
130	940	Archery	158	5	1,014	40	0	25	0.17	180	3	1,200	49	0	27	0.19
130	940	Modern Firearm	1,280	170	4,870	411	89	34	1.54	1,152	147	3,766	284	98	29	1.38
130	940	Muzzleloader	552	17	2,558	187	0	32	0.63	475	10	1,856	170	0	35	0.52
133	555	Archery	166	2	974	65	0	39	0.30	199	2	1,123	66	0	33	0.36
133	555	Modern Firearm	1,970	329	7,230	563	207	33	4.14	1,699	199	6,006	407	131	28	3.42
133	555	Muzzleloader	185	4	619	69	0	37	0.34	194	4	637	59	0	30	0.36
139	1327	Archery	73	1	408	23	0	31	0.06	56	0	409	14	0	25	0.04
139	1327	Modern Firearm	1,943	234	7,075	747	165	42	1.64	1,685	253	5,481	475	203	35	1.46
139	1327	Muzzleloader	197	3	845	75	0	38	0.15	182	2	728	60	0	33	0.14
142	774	Archery	56	6	385	11	1	19	0.08	54	4	350	12	4	28	0.07
142	774	Modern Firearm	1,877	231	5,601	633	135	36	2.72	1,607	192	4,930	398	129	29	2.32
142	774	Muzzleloader	204	25	644	57	13	31	0.30	160	15	522	46	5	29	0.23
145	357	Archery	29	0	101	11	0	38	0.08	39	0	156	14	0	36	0.11
145	357	Modern Firearm	780	134	2,229	239	72	34	2.56	724	52	2,138	235	34	35	2.17
145	357	Muzzleloader	45	3	118	21	0	44	0.13	44	6	103	13	3	32	0.14
149	1421	Archery	111	0	604	30	0	27	0.08	104	1	722	26	0	25	0.07
149	1421	Modern Firearm	1,587	175	5,283	434	74	29	1.24	1,573	99	4,891	480	48	32	1.18
149	1421	Muzzleloader	308	23	915	103	3	32	0.23	226	21	706	49	14	26	0.17

GMU	Square Miles	Weapon	2007							2008						
			No. Hunters:		Days Hunted	Harvest:		Hunter Success	Hunters / Sq. Mi.	No. Hunters:		Days Hunted	Harvest:		Hunter Success	Hunters / Sq. Mi.
			General	Permit		General	Permit			General	Permit					
127	509	Archery	472	58	3,667	185	24	39	1.04	553	16	4,618	200	12	37	1.12
127	509	Modern Firearm	1,178	339	4,420	215	144	24	2.98	923	204	3,059	302	113	37	2.21
130	940	Archery	202	3	1,412	44	0	21	0.22	252	1	1,724	78	1	31	0.27
130	940	Modern Firearm	1,220	175	3,898	321	85	29	1.48	1,199	104	3,936	415	61	37	1.39
130	940	Muzzleloader	402	8	1,575	127	0	31	0.44	547	12	2,184	205	1	37	0.59
133	555	Archery	206	1	1,174	64	0	31	0.37	250	0	1,493	87	0	35	0.45
133	555	Modern Firearm	1,589	227	5,283	408	118	29	3.27	1,407	157	4,476	514	115	40	2.82
133	555	Muzzleloader	154	3	518	56	0	36	0.28	195	0	737	70	0	36	0.35
139	1327	Archery	59	2	435	18	0	30	0.05	79	3	550	15	0	18	0.06
139	1327	Modern Firearm	1,677	314	5,421	487	160	32	1.50	1,523	235	4,513	712	166	50	1.32
139	1327	Muzzleloader	160	2	604	48	0	30	0.12	234	2	921	91	0	39	0.18
142	774	Archery	51	4	314	11	2	24	0.07	69	4	413	14	2	22	0.09
142	774	Modern Firearm	1,414	259	4,175	351	128	29	2.16	1,344	152	3,595	538	88	42	1.93
142	774	Muzzleloader	132	15	452	29	8	25	0.19	171	11	576	56	7	35	0.24
145	357	Archery	23	0	117	4	0	17	0.06	50	1	252	12	0	24	0.14
145	357	Modern Firearm	660	66	1,959	178	28	28	2.03	554	53	1,666	224	38	43	1.7
145	357	Muzzleloader	44	10	124	5	5	19	0.15	40	6	128	20	2	48	0.13
149	1421	Archery	107	0	664	26	0	24	0.08	120	1	877	25	0	21	0.09
149	1421	Modern Firearm	1,380	102	4,163	353	47	27	1.04	1,500	99	4,648	493	55	34	1.13
149	1421	Muzzleloader	225	30	729	42	11	21	0.18	187	16	630	73	9	40	0.14

**Appendix B.3 Summary of general and permit deer hunter numbers, days hunted, harvest success, and hunters per square mile by method of hunting within the Blue Mountains Zone, 2001-2008.**

GMU	Miles	Square	Weapon	2001					2002							
				No.		Days Hunted	Harvest:		Hunter Success	No.		Days Hunted	Harvest:		Hunter Success	
				General	Permit		General	Permit		General	Permit		General	Permit		
154	217	Archery	101	0	720	30	0	30	0.47	165	0	1,281	49	0	30	0.76
154	217	Modern Firearm	817	211	3,122	135	89	22	4.74	859	238	3,283	175	98	25	5.06
154	217	Muzzleloader	0	20		0	11	55	0.09	0	13		0	5	38	0.06
157	22	Modern Firearm	0	1		0	0	0	0.05	0	6		0	0	0	0.27
162	211	Archery	182	2	1,088	51	0	28	0.87	208	1	1,359	34	0	16	0.99
162	211	Modern Firearm	1,417	263	4,937	295	97	23	7.96	1,659	363	5,777	343	149	24	9.58
162	211	Muzzleloader	0	14		0	9	64	0.07	0	10		0	1	10	0.05
163	150	Archery	53	0	290	10	0	19	0.35	61	0	346	20	0	33	0.41
163	150	Modern Firearm	599	213	1,689	121	109	28	5.41	558	225	1,757	110	117	29	5.22
163	150	Muzzleloader	0	4		0	1	25	0.03	0	2		0	0	0	0.01
166	131	Archery	182	0	1,068	40	0	22	1.39	184	0	1,061	50	0	27	1.4
166	131	Modern Firearm	585	52	2,049	96	16	18	4.86	525	48	1,746	89	15	18	4.37
166	131	Muzzleloader	0	10		0	6	60	0.08	0	11		0	5	45	0.08
169	161	Archery	26	0	116	4	0	15	0.16	23	0	145	7	0	30	0.14
169	161	Modern Firearm	203	6	798	22	0	11	1.3	174	6	675	28	0	16	1.12
172	108	Archery	8	0	41	0	0	0	0.07	27	0	204	8	0	30	0.25
172	108	Modern Firearm	223	26	780	70	10	32	2.31	240	19	939	49	6	21	2.4
172	108	Muzzleloader	40	0	134	19	0	48	0.37	45	0	227	15	0	33	0.42
175	159	Archery	20	0	139	2	0	10	0.13	29	0	178	3	0	10	0.18
175	159	Modern Firearm	258	21	863	55	8	23	1.75	272	17	919	46	6	18	1.82
178	277	Archery	77	1	441	9	0	12	0.28	113	0	648	17	0	15	0.41
178	277	Modern Firearm	578	138	1,893	163	71	33	2.58	547	115	1,831	174	55	35	2.39
181	263	Archery	19	0	103	7	0	37	0.07	23	1	142	8	0	33	0.09
181	263	Modern Firearm	546	47	1,768	224	20	41	2.25	632	70	2,162	226	29	36	2.67
181	263	Muzzleloader	76	5	259	43	2	56	0.31	118	3	526	41	2	36	0.46
186	53	Archery	5	0	47	1	0	20	0.09	1	0	14	0	0	0	0.02
186	53	Modern Firearm	116	0	378	36	0	31	2.19	160	3	438	58	0	36	3.08

GMU	Miles	Square	Weapon	2003					2004							
				No.		Days Hunted	Harvest:		Hunter Success	No.		Days Hunted	Harvest:		Hunter Success	
				General	Permit		General	Permit		General	Permit		General	Permit		
154	217	Archery	166	1	1,443	50	0	30	0.77	217	5	1,417	54	0	24	1.02
154	217	Modern Firearm	920	250	3,548	174	112	24	5.39	971	206	3,457	223	78	26	5.42
154	217	Muzzleloader	0	24		0	13	54	0.11	0	16		0	4	25	0.07
162	211	Archery	211	0	1,229	31	0	15	1	269	7	1,196	42	3	16	1.31
162	211	Modern Firearm	1,655	378	5,969	337	147	24	9.64	1,822	365	6,258	329	118	20	10.36
162	211	Muzzleloader	0	14		0	5	36	0.07	5	19		0	6	25	0.11
163	150	Archery	138	0	744	26	0	19	0.92	177	10	790	21	3	13	1.25
163	150	Modern Firearm	662	225	2,095	122	114	27	5.91	858	277	2,546	136	104	21	7.57
166	131	Archery	183	0	1,043	32	0	17	1.4	169	0	813	26	0	15	1.29
166	131	Modern Firearm	519	28	1,766	102	8	20	4.18	557	35	1,901	79	5	14	4.52
166	131	Muzzleloader	0	11		0	4	36	0.08	0	3		0	1	33	0.02
169	161	Archery	20	0	105	10	0	50	0.12	44	0	183	10	0	23	0.27
169	161	Modern Firearm	209	13	781	33	0	15	1.38	239	12	908	39	0	16	1.56
172	108	Archery	20	0	124	4	0	20	0.19	25	1	112	6	0	23	0.24
172	108	Modern Firearm	183	18	643	51	6	28	1.86	257	17	874	70	5	27	2.54
172	108	Muzzleloader	50	0	234	20	0	40	0.46	69	1	276	28	0	40	0.65
175	159	Archery	29	0	196	1	0	3	0.18	59	0	353	4	0	7	0.37
175	159	Modern Firearm	266	28	960	49	3	18	1.85	336	17	1,254	46	1	13	2.22
178	277	Archery	84	0	485	17	0	20	0.3	77	1	357	13	0	17	0.28
178	277	Modern Firearm	542	119	1,763	164	63	34	2.39	559	87	1,925	160	45	32	2.33
181	263	Archery	24	0	144	11	0	46	0.09	26	0	126	8	0	31	0.1
181	263	Modern Firearm	595	72	2,015	209	39	37	2.54	674	88	2,182	192	44	31	2.9
181	263	Muzzleloader	105	0	403	51	0	49	0.4	165	0	576	67	0	41	0.63
186	53	Archery	1	0	5	0	0	0	0.02	3	0	11	1	0	33	0.06
186	53	Modern Firearm	111	1	372	34	0	30	2.11	111	3	349	40	0	35	2.15



			2005							2006						
GMU	Square Miles	Weapon	No.	No.	Days Hunted	Harvest	Harvest	Hunter Success	Hunters /	No.	No.	Days Hunted	Harvest	Harvest	Hunter Success /	Hunters
			Hunters: General	Hunters: Permit		: General	: Permit		Sq. Mi.	Hunters: General	Hunters: Permit		: General	: Permit		Sq. Mi.
154	217	Archery	172	0	1,301	43	0	25	0.79	183	1	1,221	58	0	32	0.85
154	217	Modern Firearm	862	150	3,117	223	66	29	4.66	864	90	2,853	236	57	31	4.4
154	217	Muzzleloader	0	16		0	9	56	0.07	0	1		0	4	400	0
162	211	Archery	189	1	1,190	29	0	15	0.9	118	2	725	20	0	17	0.57
162	211	Modern Firearm	1,538	268	5,665	311	134	25	8.56	1,451	140	4,953	311	98	26	7.54
162	211	Muzzleloader	0	16		0	4	25	0.08	0	5		0	6	120	0.02
163	150	Archery	149	0	849	29	0	19	0.99	128	0	682	25	0	20	0.85
163	150	Modern Firearm	543	141	1,602	107	61	25	4.56	438	57	1,332	77	31	22	3.3
166	131	Archery	134	0	736	39	0	29	1.02	67	0	330	7	0	10	0.51
166	131	Modern Firearm	356	19	1,349	51	7	15	2.86	332	17	1,131	59	11	20	2.66
166	131	Muzzleloader	0	3		0	1	33	0.02	0	2		0	3	150	0.02
169	161	Archery	22	0	120	1	0	5	0.14	2	0	6	0	0	0	0.01
169	161	Modern Firearm	202	5	860	41	0	20	1.29	217	5	812	43	0	19	1.38
172	108	Archery	25	0	107	4	0	16	0.23	24	0	112	6	0	25	0.22
172	108	Modern Firearm	213	10	845	48	2	22	2.06	239	14	951	70	4	29	2.34
172	108	Muzzleloader	58	0	208	27	0	47	0.54	73	0	238	25	0	34	0.68
175	159	Archery	61	0	405	5	0	8	0.38	54	1	350	8	0	15	0.35
175	159	Modern Firearm	308	12	1,067	61	3	20	2.01	295	15	1,184	57	2	19	1.95
178	277	Archery	70	0	332	23	0	33	0.25	98	1	545	21	0	21	0.36
178	277	Modern Firearm	496	68	1,580	152	36	33	2.04	548	38	1,712	164	24	32	2.12
181	263	Archery	18	0	88	4	0	22	0.07	25	0	117	10	0	40	0.1
181	263	Modern Firearm	527	53	1,622	200	34	40	2.21	444	32	1,526	161	30	40	1.81
181	263	Muzzleloader	137	2	511	61	0	44	0.53	157	10	609	58	4	37	0.63
186	53	Archery	3	0	31	0	0	0	0.06	5	0	10	1	0	20	0.09
186	53	Modern Firearm	80	0	244	29	0	36	1.51	89	1	304	28	0	31	1.7

			2007							2008						
GMU	Square Miles	Weapon	No.	No.	Days Hunted	Harvest	Harvest	Hunter Success	Hunters /	No.	No.	Days Hunted	Harvest	Harvest	Hunter Success /	Hunters
			Hunters: General	Hunters: Permit		: General	: Permit		Sq. Mi.	Hunters: General	Hunters: Permit		: General	: Permit		Sq. Mi.
154	217	Archery	156	0	1,098	43	0	28	0.72	209	0	1,859	60	0	29	0.96
154	217	Modern Firearm	904	111	3,361	179	41	22	4.68	880	84	3,054	242	55	31	4.44
154	217	Muzzleloader	0	22		0	10	45	0.1	0	7		0	6	86	0.03
157	22	Archery	1	0	21	1	0	100	0.05	6	0	37	1	0	17	0.27
162	211	Archery	210	1	1,330	20	0	9	1	207	1	1,405	23	0	11	0.99
162	211	Modern Firearm	1,654	182	6,262	278	66	19	8.7	1,458	106	5,234	350	49	26	7.41
162	211	Muzzleloader	0	18		0	5	28	0.09	0	10		0	8	80	0.05
163	150	Archery	114	0	634	19	0	17	0.76	117	0	858	27	0	23	0.78
163	150	Modern Firearm	374	53	1,274	55	14	16	2.85	339	37	969	93	19	30	2.51
166	131	Archery	85	0	452	8	0	9	0.65	77	0	445	14	0	18	0.59
166	131	Modern Firearm	465	18	1,596	67	4	15	3.69	480	31	1,669	60	11	14	3.9
166	131	Muzzleloader	0	4		0	1	25	0.03	0	3		0	1	33	0.02
169	161	Archery	28	0	139	4	0	14	0.17	26	0	186	1	0	4	0.16
169	161	Modern Firearm	251	2	1,089	29	0	11	1.57	236	5	930	34	0	14	1.5
172	108	Archery	32	2	210	7	0	21	0.31	28	0	213	2	0	7	0.26
172	108	Modern Firearm	211	10	788	56	5	28	2.05	225	15	784	52	5	24	2.22
172	108	Muzzleloader	63	2	215	14	0	22	0.6	69	0	291	21	0	30	0.64
175	159	Archery	108	2	733	18	0	16	0.69	98	0	710	9	0	9	0.62
175	159	Modern Firearm	362	12	1,399	54	6	16	2.35	293	18	1,093	33	1	11	1.96
178	277	Archery	107	1	588	39	0	36	0.39	136	9	914	45	8	37	0.52
178	277	Modern Firearm	517	49	1,682	127	15	25	2.04	436	43	1,325	152	22	36	1.73
181	263	Archery	25	0	107	11	0	44	0.1	26	0	183	5	0	19	0.1
181	263	Modern Firearm	448	21	1,484	135	9	31	1.78	400	20	1,351	133	5	33	1.6
181	263	Muzzleloader	150	3	506	56	0	37	0.58	145	2	577	54	0	37	0.56
186	53	Archery	7	0	15	3	0	43	0.13	8	0	47	1	0	13	0.15
186	53	Modern Firearm	89	2	288	32	0	35	1.72	113	3	339	37	2	34	2.19

**Appendix B.4 Summary of general and permit deer hunter numbers, days hunted, harvest success, and hunters per square mile by method of hunting within the Columbia Basin Zone, 2001-2008.**

GMU	Square Miles	Weapon	2001						2002							
			No. Hunters:		Days Hunted	Harvest:		Hunter Success / Sq. Mi.		No. Hunters:		Days Hunted	Harvest:		Hunter Success / Sq. Mi.	
			General	Permit		General	Permit	General	Permit	General	Permit		General	Permit		
136	1585	Archery	60	0	394	14	0	23	0.04	90	0	624	14	0	16	0.06
136	1585	Modern Firearm	1132	130	3793	324	63	31	0.8	1166	115	3940	398	57	36	0.81
136	1585	Muzzleloader	0	1		0	1	100	0	0	3		0	1	33	0
272	1779	Archery	240	8	1457	53	0	21	0.14	225	5	1574	44	0	19	0.13
272	1779	Modern Firearm	1409	295	4695	251	182	25	0.96	1377	221	4268	301	130	27	0.9
278	852	Archery	10	1	73	0	0	0	0.01	9	0	81	1	0	11	0.01
278	852	Modern Firearm	148	8	409	28	0	18	0.18	136	2	380	28	0	20	0.16
284	1657	Archery	31	0	165	9	0	29	0.02	33	0	276	8	0	24	0.02
284	1657	Modern Firearm	676	78	1969	279	53	44	0.46	643	23	1995	270	0	41	0.4
284	1657	Muzzleloader	353	4	1250	124	0	35	0.22	417	12	1710	169	0	39	0.26
290	282	Modern Firearm	0	0		0	27		0	0	37		0	29	78	0.13
290	282	Muzzleloader	0	0		0	2		0	0	5		0	0	0	0.02
381	975	Archery	44	1	315	8	0	18	0.05	43	0	283	13	0	30	0.04
381	975	Modern Firearm	432	14	1211	175	0	39	0.46	420	13	1305	189	0	44	0.44
381	975	Muzzleloader	223	2	896	94	0	42	0.23	345	9	1363	136	0	38	0.36

GMU	Square Miles	Weapon	2003						2004							
			No. Hunters:		Days Hunted	Harvest:		Hunter Success / Sq. Mi.		No. Hunters:		Days Hunted	Harvest:		Hunter Success / Sq. Mi.	
			General	Permit		General	Permit	General	Permit	General	Permit		General	Permit		
136	1585	Archery	80	0	481	22	0	28	0.05	94	0	480	30	0	32	0.06
136	1585	Modern Firearm	1,109	133	3,769	337	64	32	0.78	1,305	118	4,199	389	63	32	0.9
272	1779	Archery	222	2	1,612	50	0	22	0.13	241	5	1,652	35	0	14	0.14
272	1779	Modern Firearm	1,032	74	3,567	249	35	26	0.62	1,218	61	3,780	336	27	28	0.72
278	852	Archery	11	0	101	0	0	0	0.01	8	0	30	0	0	0	0.01
278	852	Modern Firearm	149	15	498	19	5	15	0.19	131	13	394	14	3	12	0.17
278	852	Muzzleloader	20	0	59	2	0	10	0.02	23	0	72	5	0	22	0.03
284	1657	Archery	23	0	103	5	0	22	0.01	28	0	197	10	0	36	0.02
284	1657	Modern Firearm	608	35	1,921	233	19	39	0.39	638	32	1,998	211	8	33	0.4
284	1657	Muzzleloader	100	27	342	15	22	29	0.08	122	20	390	34	4	27	0.09
290	282	Archery	0	12		0	2	17	0.04	0	13	0	0	1	8	0.05
290	282	Modern Firearm	0	35		0	24	69	0.12	0	32	0	0	23	72	0.11
290	282	Muzzleloader	0	6		0	2	33	0.02	0	5	0	0	3	60	0.02
381	975	Archery	41	0	309	11	0	27	0.04	59	0	350	18	0	31	0.06
381	975	Modern Firearm	429	24	1,284	133	9	31	0.46	584	32	1,736	162	10	28	0.63
381	975	Muzzleloader	371	68	1,625	93	34	29	0.45	407	66	1,633	57	34	19	0.49

			2005							2006						
GMU	Square Miles	Weapon	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success	Hunters / Sq. Mi.	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success	Hunters / Sq. Mi.
			Hunters: General	Hunters: Permit		General	Permit			General	Permit		General	Permit		
136	1585	Archery	104	3	614	26	0	24	0.07	121	1	644	31	0	25	0.08
136	1585	Modern Firearm	1,141	114	3,625	349	66	33	0.79	1,018	104	3,245	294	60	32	0.71
272	1779	Archery	251	15	1,687	44	3	18	0.15	246	2	1,507	60	0	24	0.14
272	1779	Modern Firearm	1,074	97	3,292	224	69	25	0.66	911	33	2,852	255	25	30	0.53
278	852	Archery	33	0	190	4	0	12	0.04	34	0	175	1	0	3	0.04
278	852	Modern Firearm	161	26	473	14	10	13	0.22	138	0	378	39	0	28	0.16
278	852	Muzzleloader	17	1	46	7	1	44	0.02	48	1	132	10	0	20	0.06
284	1657	Archery	28	1	145	4	0	14	0.02	31	1	182	7	1	25	0.02
284	1657	Modern Firearm	564	31	1,571	213	15	38	0.36	546	17	1,616	219	16	42	0.34
284	1657	Muzzleloader	79	32	241	9	11	18	0.07	57	12	170	13	13	38	0.04
290	282	Archery	0	12		0	3	25	0.04	0	9		0	3	33	0.03
290	282	Modern Firearm	0	31		0	26	84	0.11	0	12		0	51	425	0.04
290	282	Muzzleloader	0	5		0	3	60	0.02	0	2		0	8	400	0.01
381	975	Archery	67	0	331	17	0	25	0.07	49	0	280	12	0	24	0.05
381	975	Modern Firearm	534	27	1,540	181	10	34	0.58	465	43	1,458	124	30	30	0.52
381	975	Muzzleloader	318	67	1,313	73	32	27	0.39	126	5	371	31	5	27	0.13

			2007							2008						
GMU	Square Miles	Weapon	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success	Hunters / Sq. Mi.	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success	Hunters / Sq. Mi.
			Hunters: General	Hunters: Permit		General	Permit			General	Permit		General	Permit		
136	1585	Archery	112	4	680	45	0	39	0.07	145	2	893	47	0	32	0.09
136	1585	Modern Firearm	918	112	2,775	311	56	36	0.65	986	85	2,932	418	60	45	0.68
272	1779	Archery	273	6	1,978	51	0	18	0.16	300	3	2,036	61	1	20	0.17
272	1779	Modern Firearm	830	34	2,627	237	16	29	0.49	1,044	31	3,466	242	13	24	0.6
272	1779	Muzzleloader	0	1		0	0	0	0	0	4		0	1	25	0
278	852	Archery	35	3	166	4	0	11	0.04	65	2	376	8	0	12	0.08
278	852	Modern Firearm	142	0	479	24	0	17	0.17	157	1	595	19	0	12	0.19
278	852	Muzzleloader	35	4	110	5	0	13	0.05	48	0	153	15	0	31	0.06
284	1657	Archery	40	1	208	8	0	20	0.02	43	0	220	16	0	37	0.03
284	1657	Modern Firearm	475	29	1,497	143	17	32	0.3	604	22	1,901	174	15	30	0.38
284	1657	Muzzleloader	67	14	221	11	7	22	0.05	33	16	65	15	9	49	0.03
290	282	Archery	10	7	36	0	0	0	0.06	2	4	3	0	1	17	0.02
290	282	Modern Firearm	0	52		0	41	79	0.18	0	46		0	40	87	0.16
290	282	Muzzleloader	0	2		0	2	100	0.01	0	1		0	1	100	0
373	1167	Archery	31	0	248	5	0	16	0.03	67	0	413	13	0	19	0.06
373	1167	Modern Firearm	194	15	597	56	5	29	0.18	274	17	869	79	4	29	0.25
373	1167	Muzzleloader	0	26		0	14	54	0.02	0	10		0	8	80	0.01
379	515	Archery	18	0	82	4	0	22	0.03	36	1	189	11	0	30	0.07
379	515	Modern Firearm	103	2	274	24	0	23	0.2	182	4	445	50	0	27	0.36
379	515	Muzzleloader	144	4	416	23	0	16	0.29	135	2	445	32	0	23	0.27
381	975	Archery	54	0	285	18	0	33	0.06	93	2	473	18	2	21	0.1
381	975	Modern Firearm	534	83	1,534	143	53	32	0.63	551	50	1,738	184	30	36	0.62
381	975	Muzzleloader	123	18	353	23	4	19	0.14	112	34	326	34	20	37	0.15

**Appendix B.5 Summary of general and permit deer hunter numbers, days hunted, harvest success, and hunters per square mile by method of hunting within the Okanogan Highlands Zone, 2001-2008.**

			2001							2002						
GMU	Square Miles	Weapon	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success / Sq. Mi.	Hunters	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success / Sq. Mi.	Hunters
			Hunters: General	Hunters: Permit		General	Permit			General	Permit		General	Permit		
101	1103	Archery	670	2	4,579	173	0	26	0.61	746	2	5,060	175	0	23	0.68
101	1103	Modern Firearm	4,035	203	18,621	932	80	24	3.84	4,077	162	19,212	819	58	21	3.84
101	1103	Muzzleloader	0	3		0	2	67	0	0	1		0	0	0	0
204	999	Archery	183	0	1,055	51	0	28	0.18	211	0	1,244	41	0	19	0.21
204	999	Modern Firearm	2,773	86	12,696	543	34	20	2.86	2,967	114	14,192	568	28	19	3.08

			2003							2004						
GMU	Square Miles	Weapon	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success / Sq. Mi.	Hunters	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success / Sq. Mi.	Hunters
			Hunters: General	Hunters: Permit		General	Permit			General	Permit		General	Permit		
101	1103	Archery	627	4	4,305	176	0	28	0.57	729	6	4,226	197	0	27	0.67
101	1103	Modern Firearm	3,683	138	17,630	925	40	25	3.46	4,228	128	18,743	1,145	46	27	3.95
101	1103	Muzzleloader	194	1	801	76	0	39	0.18	245	3	828	88	0	35	0.22
204	999	Archery	240	0	1,373	75	0	31	0.24	287	0	1,682	61	0	21	0.29
204	999	Modern Firearm	2,805	149	13,063	521	79	20	2.96	3,064	138	13,830	646	63	22	3.21
204	999	Muzzleloader	45	2	151	10	0	21	0.05	86	6	362	20	2	24	0.09

			2005							2006						
GMU	Square Miles	Weapon	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success / Sq. Mi.	Hunters	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success / Sq. Mi.	Hunters
			Hunters: General	Hunters: Permit		General	Permit			General	Permit		General	Permit		
101	1103	Archery	689	4	4,229	235	0	34	0.63	784	14	5,063	258	0	32	0.72
101	1103	Modern Firearm	3,545	135	16,630	882	29	25	3.34	3,737	117	17,597	859	28	23	3.49
101	1103	Muzzleloader	205	4	801	96	0	46	0.19	287	7	1,202	93	0	32	0.27
204	999	Archery	286	1	1,691	96	0	33	0.29	346	6	1,988	105	0	30	0.35
204	999	Modern Firearm	2,732	183	12,469	540	97	22	2.92	2,899	170	13,035	596	101	23	3.07
204	999	Muzzleloader	84	6	288	26	2	31	0.09	102	3	340	29	0	28	0.11

			2007							2008						
GMU	Square Miles	Weapon	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success / Sq. Mi.	Hunters	No.	No.	Days Hunted	Harvest:	Harvest:	Hunter Success / Sq. Mi.	Hunters
			Hunters: General	Hunters: Permit		General	Permit			General	Permit		General	Permit		
101	1103	Archery	777	24	5,473	208	0	26	0.73	807	14	6,065	228	2	28	0.74
101	1103	Modern Firearm	3,170	97	15,093	693	27	22	2.96	3,407	104	15,962	717	35	21	3.18
101	1103	Muzzleloader	286	6	1,127	85	0	29	0.26	343	1	1,523	113	0	33	0.31
204	999	Archery	351	4	2,107	90	1	26	0.36	486	4	2,701	133	1	27	0.49
204	999	Modern Firearm	3,126	188	13,919	548	93	19	3.32	3,071	152	14,051	443	85	16	3.23
204	999	Muzzleloader	102	4	391	23	0	22	0.11	115	6	428	26	2	23	0.12

**Appendix B.6 Summary of general and permit deer hunter numbers, days hunted, harvest success, and hunters per square mile by method of hunting within the North Cascades Zone, 2001-2008.**

GMU	Square Miles	Weapon	2001							2002						
			No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success / Sq. Mi.	Hunters	No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success / Sq. Mi.	Hunters
209	181	Archery	92	0	556	16	0	17	0.51	80	0	509	21	0	26	0.44
209	181	Modern Firearm	653	20	2,291	172	6	26	3.72	811	30	2,913	219	4	27	4.65
209	181	Muzzleloader	47	1	162	8	0	17	0.27	93	26	310	11	17	24	0.66
215	427	Archery	408	0	2,473	98	0	24	0.96	490	0	3,145	111	0	23	1.15
215	427	Modern Firearm	1,406	60	6,229	254	24	19	3.43	1,541	78	6,940	342	28	23	3.79
215	427	Muzzleloader	0	4		0	2	50	0.01	5	1	19	4	0	67	0.01
218	472	Archery	241	0	1,192	98	0	41	0.51	301	3	1,454	116	0	38	0.64
218	472	Modern Firearm	1,994	65	8,611	425	26	22	4.36	2,284	65	10,163	400	23	18	4.98
224	303	Archery	174	1	906	76	0	43	0.58	225	0	1,256	95	0	42	0.74
224	303	Modern Firearm	2,345	74	10,162	503	32	22	7.98	2,558	70	11,221	447	33	18	8.67
224	303	Muzzleloader	0	1		0	1	100	0	15	0	29	5	0	33	0.05
231	248	Archery	111	0	524	48	0	43	0.45	145	0	768	54	0	37	0.58
231	248	Modern Firearm	1,180	44	4,934	249	24	22	4.94	1,176	45	5,116	217	19	19	4.92
231	248	Muzzleloader	0	1		0	1	100	0	7	2	34	0	1	11	0.04
233	228	Archery	133	0	859	40	0	30	0.58	159	1	930	44	0	28	0.7
233	228	Modern Firearm	854	31	3,478	178	15	22	3.88	926	26	3,536	206	13	23	4.18
233	228	Muzzleloader	0	1		0	1	100	0	1	0	5	1	0	100	0
239	356	Archery	48	0	236	15	0	31	0.13	46	0	214	10	0	22	0.13
239	356	Modern Firearm	1,050	44	4,266	209	23	21	3.07	1,108	39	4,582	213	22	20	3.22
239	356	Muzzleloader	92	3	283	10	0	11	0.27	100	3	362	13	2	15	0.29
242	435	Archery	111	0	438	30	0	27	0.26	98	2	453	24	0	24	0.23
242	435	Modern Firearm	1,433	50	5,599	248	21	18	3.41	1,621	64	6,698	251	20	16	3.87
242	435	Muzzleloader	0	1		0	0	0	0	12	0	27	4	0	33	0.03
243	356	Archery	22	0	100	1	0	5	0.06	19	0	87	4	0	21	0.05
243	356	Modern Firearm	322	15	1,229	49	9	17	0.95	269	8	1,144	55	2	21	0.78
243	356	Muzzleloader	7	2	28	1	0	11	0.03	13	0	38	3	0	23	0.04
247	222	Archery	12	0	64	0	0	0	0.05	365	5	2,068	70	0	19	1.67
247	222	Modern Firearm	680	30	2,727	69	13	12	3.2	753	34	2,968	108	21	16	3.55
247	222	Muzzleloader	0	1		0	1	100	0	0	2		0	1	50	0.01
250	217	Archery	319	3	1,741	55	0	17	1.48	304	4	1,469	27	0	9	1.42
250	217	Modern Firearm	442	19	1,600	58	12	15	2.12	480	37	1,884	72	24	19	2.38
250	217	Muzzleloader	16	0	46	1	0	6	0.07	8	0	30	0	0	0	0.04

GMU	Square Miles	Weapon	2003							2004						
			No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.	No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.
			209	181	Archery	33	0	213	7	0	21	0.18	69	0	447	12
209	181	Modern Firearm	316	25	1,281	47	19	19	1.88	411	26	1,509	106	19	29	2.41
209	181	Muzzleloader	65	29	234	9	20	31	0.52	81	29	299	3	16	17	0.61
215	427	Archery	438	0	2,723	96	0	22	1.03	497	1	2,918	108	0	22	1.17
215	427	Modern Firearm	1,348	154	6,071	198	78	18	3.52	1,537	122	6,946	312	59	22	3.89
218	472	Archery	219	1	1,144	64	0	29	0.47	307	1	1,498	124	0	40	0.65
218	472	Modern Firearm	1,793	146	8,029	345	89	22	4.11	2,017	100	9,210	369	56	20	4.49
224	303	Archery	187	0	1,058	67	0	36	0.62	267	6	1,385	100	0	37	0.9
224	303	Modern Firearm	1,892	144	8,908	345	91	21	6.72	2,313	113	10,781	451	61	21	8.01
231	248	Archery	80	0	457	25	0	31	0.32	125	1	630	42	0	33	0.51
231	248	Modern Firearm	939	87	4,041	196	44	23	4.14	1,079	57	4,651	226	26	22	4.58
233	228	Archery	151	1	1,002	34	0	22	0.67	130	1	780	24	0	18	0.57
233	228	Modern Firearm	743	55	3,119	118	31	19	3.5	787	51	3,300	153	26	21	3.68
233	228	Muzzleloader	27	2	86	8	0	28	0.13	38	3	94	17	1	44	0.18
239	356	Archery	36	0	172	5	0	14	0.1	57	1	353	13	0	22	0.16
239	356	Modern Firearm	907	69	3,913	139	44	19	2.74	1,006	71	4,299	251	39	27	3.03
239	356	Muzzleloader	55	3	190	11	0	19	0.16	69	7	259	6	4	13	0.21
242	435	Archery	87	0	389	26	0	30	0.2	110	1	497	29	0	26	0.26
242	435	Modern Firearm	1,369	129	5,725	203	52	17	3.44	1,447	78	6,101	308	45	23	3.51
243	356	Archery	23	0	134	3	0	13	0.06	43	1	223	4	0	9	0.12
243	356	Modern Firearm	329	13	1,255	63	4	20	0.96	375	7	1,418	83	3	23	1.07
243	356	Muzzleloader	8	1	19	1	0	11	0.03	6	0	15	0	0	0	0.02
247	222	Archery	586	0	3,031	166	0	28	2.64	340	190	1,936	1	45	9	2.39
247	222	Modern Firearm	980	70	4,194	138	41	17	4.73	1,332	61	5,605	264	43	22	6.27
250	217	Archery	259	0	1,211	52	0	20	1.19	515	22	2,809	55	0	10	2.47
250	217	Modern Firearm	476	47	1,777	70	33	20	2.41	608	43	2,300	129	20	23	3
250	217	Muzzleloader	8	2	12	1	0	10	0.05	12	2	33	4	0	29	0.06

GMU	Square Miles	Weapon	2005							2006						
			No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success / Sq. Mi.	Hunter Success / Sq. Mi.	No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success / Sq. Mi.	Hunter Success / Sq. Mi.
			209	181	Archery	67	0	416	12	0	18	0.37	90	2	515	23
209	181	Modern Firearm	337	24	1,222	73	18	25	1.99	434	30	1,596	94	24	25	2.56
209	181	Muzzleloader	61	38	201	5	32	37	0.55	35	13	133	1	18	40	0.27
215	427	Archery	411	5	2,388	101	0	24	0.97	438	0	2,462	99	0	23	1.03
215	427	Modern Firearm	1,388	144	6,275	272	89	24	3.59	1,154	118	5,149	136	69	16	2.98
218	472	Archery	283	2	1,355	105	0	37	0.6	247	0	1,223	84	0	34	0.52
218	472	Modern Firearm	1,757	129	8,471	203	73	15	4	1,224	96	5,869	116	58	13	2.8
224	303	Archery	233	1	1,088	82	0	35	0.77	209	1	1,034	59	0	28	0.69
224	303	Modern Firearm	2,215	168	10,604	327	105	18	7.86	1,404	112	6,376	147	63	14	5
231	248	Archery	105	3	405	43	0	40	0.44	139	0	647	40	0	29	0.56
231	248	Modern Firearm	1,036	72	4,538	151	34	17	4.47	847	62	3,713	104	40	16	3.67
233	228	Archery	131	0	789	35	0	27	0.57	119	0	714	24	0	20	0.52
233	228	Modern Firearm	741	55	3,101	153	32	23	3.49	687	51	2,888	89	35	17	3.24
233	228	Muzzleloader	18	3	54	5	0	24	0.09	30	3	83	2	3	15	0.14
239	356	Archery	74	1	429	18	0	24	0.21	46	2	268	17	0	35	0.13
239	356	Modern Firearm	1,077	82	4,447	229	52	24	3.26	963	82	4,030	90	53	14	2.94
239	356	Muzzleloader	46	6	165	8	1	17	0.15	41	2	140	4	0	9	0.12
242	435	Archery	100	1	465	33	0	33	0.23	67	0	334	14	0	21	0.15
242	435	Modern Firearm	1,372	102	6,153	208	51	18	3.39	1,229	85	5,322	156	55	16	3.02
242	435	Muzzleloader	35	2	120	4	0	11	0.09	42	2	116	9	2	25	0.1
243	356	Archery	67	0	331	3	0	4	0.19	42	1	262	9	0	21	0.12
243	356	Modern Firearm	380	10	1,621	70	2	18	1.1	382	11	1,459	50	4	14	1.1
243	356	Muzzleloader	8	0	22	4	0	50	0.02	9	0	37	0	0	0	0.03
247	222	Archery	281	204	1,348	3	122	26	2.18	177	69	794	22	91	46	1.11
247	222	Modern Firearm	1,250	55	5,421	164	37	15	5.88	1,107	55	4,669	97	62	14	5.23
250	217	Archery	425	7	2,276	71	0	16	1.99	681	12	3,285	200	0	29	3.19
250	217	Modern Firearm	509	39	1,884	93	27	22	2.53	513	29	1,835	75	41	21	2.5
250	217	Muzzleloader	16	1	63	4	0	24	0.08	17	4	75	1	2	14	0.1

GMU	Square Miles	Weapon	2007							2008						
			No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.	No. Hunters: General	No. Hunters: Permit	Days Hunted	Harvest: General	Harvest: Permit	Hunter Success	Hunters / Sq. Mi.
209	181	Archery	87	1	637	11	0	13	0.49	101	0	560	27	0	27	0.56
209	181	Modern Firearm	328	38	1,252	46	18	17	2.02	351	25	1,344	49	15	17	2.08
209	181	Muzzleloader	50	26	156	2	9	14	0.42	28	14	120	6	8	33	0.23
215	427	Archery	402	5	2,419	83	0	20	0.95	546	1	3,085	124	0	23	1.28
215	427	Modern Firearm	1,187	168	5,101	150	83	17	3.17	1,155	87	4,787	121	44	13	2.91
218	472	Archery	241	2	1,343	87	0	36	0.51	210	2	1,171	60	0	28	0.45
218	472	Modern Firearm	1,253	152	5,714	162	62	16	2.98	1,259	101	5,784	88	56	11	2.88
224	303	Archery	202	3	828	49	1	24	0.68	209	2	1,083	52	2	26	0.7
224	303	Modern Firearm	1,675	164	7,334	197	85	15	6.07	1,622	96	7,194	130	56	11	5.67
231	248	Archery	137	9	651	48	7	38	0.59	122	13	506	38	11	36	0.54
231	248	Modern Firearm	652	74	2,760	80	39	16	2.93	669	62	2,656	69	42	15	2.95
233	228	Archery	117	1	746	30	0	25	0.52	181	3	938	49	1	27	0.81
233	228	Modern Firearm	653	89	2,653	90	38	17	3.25	675	55	2,632	85	33	16	3.2
233	228	Muzzleloader	23	2	94	4	0	16	0.11	29	2	96	11	0	35	0.14
239	356	Archery	33	1	252	9	0	26	0.1	61	4	420	17	2	29	0.18
239	356	Modern Firearm	932	105	3,690	117	54	16	2.91	810	71	3,321	79	43	14	2.47
239	356	Muzzleloader	46	1	166	2	1	6	0.13	25	2	97	2	0	7	0.08
242	435	Archery	100	4	483	15	1	15	0.24	50	4	249	15	2	31	0.12
242	435	Modern Firearm	1,077	106	4,398	132	46	15	2.72	1,065	80	4,565	108	46	13	2.63
242	435	Muzzleloader	34	2	130	2	1	8	0.08	45	5	196	5	2	14	0.11
243	356	Archery	56	2	286	3	0	5	0.16	55	1	319	6	0	11	0.16
243	356	Modern Firearm	359	6	1,492	64	3	18	1.03	377	14	1,468	50	5	14	1.1
243	356	Muzzleloader	11	0	36	0	0	0	0.03	8	0	26	0	0	0	0.02
247	222	Archery	366	192	1,947	29	82	20	2.51	102	89	482	26	61	46	0.86
247	222	Modern Firearm	1,352	138	5,381	154	93	17	6.71	1,262	101	4,944	116	74	14	6.14
250	217	Archery	709	19	3,710	121	0	17	3.35	889	9	5,089	150	1	17	4.14
250	217	Modern Firearm	540	71	1,974	65	52	19	2.82	532	54	1,704	73	41	19	2.7
250	217	Muzzleloader	30	7	132	7	2	24	0.17	19	7	73	6	3	35	0.12



## **Appendix C Statutes related to domestic dogs harassing wildlife.**

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### **77.12.315 Dogs harassing deer and elk-Declaration of emergency-Taking dogs into custody or destroying-Immunity.**

If the director determines that a severe problem exists in an area of the state because deer and elk are being pursued, harassed, attacked or killed by dogs, the director may declare by emergency rule that an emergency exists and specify the area where it is lawful for fish and wildlife officers to take into custody or destroy the dogs if necessary. Fish and wildlife officers who take into custody or destroy a dog pursuant to this section are immune from civil or criminal liability arising from their actions.

[2000 c 107 § 221; 1987 c 506 § 40; 1980 c 78 § 49; 1971 ex.s. c 183 § 1.] NOTES: Legislative findings and intent-1987 c 506: See note following RCW 77.04.020. Effective date-Intent, construction-Savings-Severability-1980 c 78: See notes following RCW 77.04.010

### **77.15.240 Unlawful use of dogs-Public nuisance-Penalty.**

(1) A person is guilty of unlawful use of dogs if the person: (a) Negligently fails to prevent a dog under the person's control from pursuing or injuring deer, elk, or an animal classified as endangered under this title; (b) Uses the dog to hunt deer or elk; or (c) During the closed season for a species of game animal or game bird, negligently fails to prevent the dog from pursuing such animal or destroying the nest of a game bird. (2) Unlawful use of dogs is a misdemeanor. A dog that is the basis for a violation of this section may be declared a public nuisance.

**Effective Date:** 7/11/08

**Page:** 1 of 3

## **POLICY - 5302**

**Cancels:** WDFW M6002

**See Also:** PRO 5302

Approval By: /s/ Joe Stohr

### **POL - 5302 FEEDING WILDLIFE DURING THE WINTER**

This policy applies to all WDFW employees except if policies and procedures are in conflict with or are modified by a bargaining unit agreement, the agreement language shall prevail.

#### **Definitions:**

**Artificial feeding:** The distribution of harvested feed for wildlife through either supplemental feeding or emergency feeding.

**Emergency feeding:** The occasional feeding of wildlife, which the Department implements due to extreme winter conditions or a disaster such as fire or drought.

**Supplemental feeding:** The Department's regular winter-feeding operations to provide feed to wildlife where adequate winter habitat is not available and feeding is necessary to support the population level as identified in a management plan, or for specific control of deer or elk damage.

#### **1. WDFW May Provide Supplemental or Emergency Feeding for Wildlife Under the Following Conditions**

- A. To prevent and/or reduce deer or elk damage to private property (agricultural or horticultural crops).
- B. To support a Department management plan.
- C. To respond to an emergency as determined by the Director or the Director's designee.

- D. To allow for the regeneration of winter habitat that has been severely damaged or destroyed by disaster, such as fire or drought.
- E. For Department approved wildlife research or wildlife capture.
- F. In areas or times where hunting seasons have closed.

## **2. The Director or Director's Designee Declares an Emergency**

Implementation of emergency feeding operations will begin after an emergency has been declared in a specific location of the state. The Director's Emergency Feeding Advisory Team will include the Assistant Directors of the Enforcement Program, Wildlife Program, and affected Regional Director(s).

## **3. WDFW Will Use the Following Factors to Determine Whether an Emergency Exists in a Specific Location of the State**

- A. **Weather conditions and forecast:**  
Includes conditions such as abnormally cold temperatures, extreme wind chill, snow depth, icing, or crusting over a prolonged period of time. Evaluation may also include the forecasted weather to reflect early arrival and projected duration of severe winter weather.
- B. **Concentration and distribution of wildlife:**  
Includes assessment of wildlife patterns such as animals concentrated in unusually high numbers in a specific area or located in areas where they are generally not found.
- C. **Access to natural forage:**  
Assessment of availability of natural forage, including factors that may limit access (such as snow depth, icing, or crusting)
- D. **Disaster:**  
Includes description of disaster (such as fire or drought) and its impact on wildlife, such as winter range that has been severely damaged or destroyed. Feeding may be an option to provide adequate time for recovery of wildlife habitat and subsequently reduce wildlife mortality.

E. **Physical condition of wildlife:**

Evaluation to determine the physiological condition of animals, including experienced judgment by Department personnel based on knowledge of local wildlife. Evaluation may include bone marrow and kidney fat analysis to evaluate body fat reserves necessary for winter survival.

**4. WDFW May Discourage Private Feeding of Wildlife**

The Department discourages private feeding of wildlife where animals may become a problem or a nuisance, cause damage to property, or present a health risk.

WDFW will provide the public with information on the appropriate way for winter-feeding of wildlife (i.e., deer, elk, upland birds, songbirds).

WDFW may provide feed in those situations where private actions will complement agency staff supplemental or emergency feeding.

**5. WDFW Will Accept Donations to Help Pay for Emergency Winter Feeding**

## Appendix E Predator-prey literature review.

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The authors conducted a literature review of predator-prey studies. We focused on general, foundational papers that put the predator-prey process in perspective and also on papers that specifically addressed coyote-deer systems where control efforts showed some level of success in terms of improved survival or recruitment of deer.

This review only scratches the surface of the terrestrial mammal, predator-prey information that currently appears in the scientific literature (Linnell et al. 1995).

A few common themes arose in this review. One commonality was that there were an equal number of papers in the scientific literature that illustrate a benefit to deer populations resulting from predator control as there are papers that show no detectable benefits to deer populations resulting from predator control.

Another similarity in the papers reviewed was the importance of scale. In general terms, the size of treatment areas were about 15 to 20 square miles or smaller. To put that figure in perspective, the average Game Management Unit size in the Selkirk Zone is 711 square miles (range 288 to 1,103 square miles).

Also most studies that showed success in improving deer populations via predator control did so through improving neonate survival. Like most ungulates, deer are highly vulnerable in the first few weeks of life. Predators tend to key on young during the fawning season. Management efforts that effectively reduce this pressure on fawns can potentially improve deer numbers over time.

A final similarity that we noticed in the review was that upon cessation of predator control efforts, the benefits that had been realized subsided in one to two years. The take home message being that to be effective, predator control efforts must be fairly continuous.

Ballard et al. (2001) are relatively noncommittal when it comes to cause and effect related to predation and ungulate populations, however, they did an excellent job reviewing the recent literature as it relates to deer-predator relationships. In addition to their review they also provided a primer on predator-prey theory and terminology. We follow their lead in using the definitions for *limiting factors* and *regulating factors*. As they explained “...any mortality factor that reduces the rate of population growth is a limiting factor”. For any given deer population there could be a number of limiting factors that fit this definition: hunting, predation, auto-collisions, disease, etc. A regulating factor, however, is an external factor(s) that forces a population to hold at some equilibrium or pseudo-equilibrium level where recruitment and mortality are offsetting. By this definition, a regulating factor will always be a limiting factor, but a limiting factor will not always regulate a population.

Additionally, Ballard et al. (2001) describe the differences between additive and compensatory mortality. They mention how difficult it is to categorize a mortality source into one or the other category, how the two categories are not discrete, that any given source of mortality could be characterized as a mixture of the two, and finally that under the right conditions a mortality source could switch from one category to the other by season or year. They offer four theories related to regulation and stable population states: Recurrent Fluctuations, Low-Density Equilibrium, Multiple Equilibria, and Stable Limit Cycles. The theories are academic in nature, have not been tested or confirmed on deer, and would neither make nor break the argument for predator control. They

*This review only scratches the surface of the terrestrial mammal, predator-prey information that currently appears in the scientific literature.*

provide a good discussion about a prey population's relationship to its carrying capacity (K) and how predation might affect a prey population differently depending on that relationship to K.

Theoretically a population well below carrying capacity could be held at some lower level because of a limiting factor like predation. But a prey population at or near K would be less affected by the impacts of predation and would instead be regulated by the environmental resources supporting that population. These too are academic discussions about unproven theories. Reading this paper one is forced to entertain two requisite steps. First would be an intensive study of the prey population to determine if predation is having an impact on neonates. The second would be another intensive study to determine the population's relationship to the sites carrying capacity to determine the potential effectiveness of a proposed predator control program. The former would be very expensive and difficult to achieve the sample size and geographic scale to make broad management inference. The latter would be difficult even with an unlimited budget unless reliable indices could be identified that gave insight into the carrying capacity. There would still be an enormous cost associated with validating those indices.

Hamlin et al. (1984) pointed out the importance of alternate prey sources as they related to mule deer fawn survival in the Missouri Breaks of Montana. They found that fawn survival increased when vole (microtine rodent) populations were high and provided a readily available prey base for coyotes in summer. They did not see the same relationship between fawn survival and other prey species like jack rabbits, cottontail rabbits, and deer mice. Subsequent work in other studies have shown that the timing and amount of precipitation in arid climates such as this will influence plants that influence microtine populations, which from Hamlin et al.'s (1984) work would ultimately influence the effect coyote predation has on fawn survival for mule deer (Mackie et al 1998). Systems with confounding entities like alternate prey and confounding processes like prey switching could make predator control a less than viable management tool.

Beasom (1974) cited several examples where predators focused on ungulate neonates (coyote-pronghorn, jackal-blesbok, lynx-caribou, and coyote-white-tailed deer). His coyote control experiments showed a substantial difference in fawn:doe ratios and deer densities with the treatment area having more deer. The unusual aspect of this study was that the control area was the Welder Wildlife Refuge that received some low-intensity coyote trapping and shooting control from refuge technicians. This had been standard procedure for decades. The experimental area received intensive predator control which included trapping, strychnine poisoning, shooting (both day and night operations), and the use of cyanide delivery devices known as M-44s. So the comparison was between high level and low level treatments. Both areas were about 5,400 acres. The intensively controlled area showed measureable improvements in white-tailed deer numbers. There was no mention of cost effectiveness made.

Austin et al. (1977) cited four papers that showed a major influence on fawn survival and a positive population effect for deer in those studies that employed predator control. They also cited four studies that showed no predator influence on deer populations. Their own study was conducted in two drainages in Utah that supported separate wintering populations of mule deer. The treatment area showed a significant difference in end of winter ratios counts on fawn:adult numbers. The study sites were 40 and 30 sq. km. respectively. The drainage receiving predator control showed marked improvements in mule deer numbers.

Whittaker and Lindzey (1999) observed coyote predation on both mule deer and white-tailed deer on the Rocky Mountain Arsenal in Colorado. Coyote predation on fawns of both white-tailed deer and mule deer was high (79% of marked animals). White-tailed deer showed an average parturition date 8 to 10 days earlier than mule deer. Mule deer were higher in numbers (4:1) than white-tailed

deer on the study site and therefore drove the peak parturition which was also later than white-tailed deer. The higher numbers and the later parturition were seen as an advantage for mule deer with respect to coyote predation.

Hailey (1995) listed two case studies where coyote control on ranches in Texas improved fawn survival and overall deer numbers. Control of coyotes was accomplished by aerial gunning. Gunning was deemed necessary and conducted each year. The author stressed the importance of coyote removals just before the fawning period, providing an “open window” from just before fawning to about two weeks after fawning, although he didn’t always adhere to his own prescription. The author didn’t explain how he knew when coyotes would respond to the removals either by immigration or demographically but he did indicate that both processes were occurring. Perhaps this was based on field observations or other empirical data. Hailey (1995) clearly shows the effectiveness of coyote removals by aerial gunning if the landscape is open enough to be effective and the socio-political climate is not resistant. Whether this would be a practical management solution in habitat that is less open is uncertain and would need to be explored further.

In the last decade, New Mexico Game and Fish (NMGF) implemented a coyote control program in four high priority units in an attempt to reverse the declining trend of mule deer in historic deer habitat. The coyote control program was part of a multi-faceted effort that included increased law enforcement, habitat improvement, increased deer surveys, and a public relations effort to include involved landowners regarding habitat improvements and predator control. The program was deemed inconclusive. Detectable increases and decreases in the mule deer population or changes in fawn survival could not be separated from the effect of annual weather events. Biologists with NMGF speculated from their results and from research in similar habitats in other western states that the extent and the intensity required for a coyote control program to have a detectable positive influence on mule deer populations was well beyond the current levels of funding and staff time (D. Weybright, Big Game Coordinator, NMGF, pers. comm.).

Bodenchuck et al. (2002) looked at the relationship between predator management and agriculture, wildlife, and human health. Using various economic tools they were able to assign dollar values to not only the effort expended on predator control but the economic returns that resulted, both proximal and sometimes far-reaching. They provided four examples of coyote control work designed to improve ungulate populations in Utah. Three case studies involved the Pahvant, Henry Mountains, and Bookcliffs mule deer herds. Bodenchuck et al. (2002) reported benefit:cost ratios of these three efforts at 22.6:1; 11.4:1; and 18:1 respectively in U.S. dollars. They assigned a dollar value to mule deer of \$300 based on civil penalties levied for illegal take. The fourth case study involved pronghorn and showed a 1.92:1 benefit:cost ratio. If one accepts the assumptions and economic formulae that Bodenchuck et al. (2002) employ, the economic returns on these coyote control efforts in Utah are remarkable. As mentioned previously this work was conducted in relatively open habitat that lends itself to aerial gunning.

## Appendix F White-tailed Deer Plan Development Process and Timeline.

Action and Participants	Time Frame	Notes
Drafting and development of the plan by WDFW staff biologists and managers	April 2009 – July 2010	Assistant Wildlife Biologists, District Biologists, Regional Wildlife Managers, GIS/Data Support Specialist, Management Analyst, Deer and Elk Specialist, Deer Researcher, Deer and Elk Section Manager
Internal review by WDFW staff biologists and managers	October 12 – November 3, 2009	Assistant Wildlife Biologists, District Biologists, Regional Wildlife Managers, Regional Directors
Fish and Wildlife Commission, Wildlife Committee briefing	November 5, 2009	Four members of the Commission make up the Wildlife Committee
Fish and Wildlife Commission, Wildlife Committee review	November 18 – December 3, 2009	Four members of the Commission make up the Wildlife Committee
Fish and Wildlife Commission, Wildlife Committee briefing	December 3, 2009	Four members of the Commission make up the Wildlife Committee
Commission briefing on plan status	December 4, 2009	Full Commission
External peer review	November 25, 2009 – January 12, 2010	Fifteen managers and biologists with the following entities were contacted: U.S. Forest Service; Bureau of Land Management; U.S. Fish and Wildlife Service; Idaho Fish and Game; B.C. Ministry of the Environment, Montana Fish, Wildlife and Parks; Washington DNR; Confederated Tribes of the Umatilla Indian Reservation; Kalispell Tribe of Indians; Nez Perce Tribe; Spokane Tribe of Indians; Confederated Tribes of the Colville Reservation; Yakama Indian Nation
Director's review	December 3, 2009 – January 22, 2010	
Fish and Wildlife Commission, Wildlife Committee briefing	February 4, 2010	Four members of the Commission make up the Wildlife Committee
Public comment period	March 8 – April 23, 2010	The Department solicited public comment on the draft plan by news release on March 8. We also emailed 27,133 hunters who had reported deer hunting in GMUs that resided in white-tailed deer country. The draft plan was posted on the Department web site and a web based survey tool was used to collect submissions.
SEPA comment period	April 1 – April 22, 2010	Standard SEPA protocols used
Wildlife Program final, leadership review	June 14 – July 15, 2010	Game Division Manager, Deputy Assistant Director, Assistant Director
Director's office final, review	June 25 – July 15, 2010	
Final comments from Fish and Wildlife Commission Wildlife Committee	August 13, 2010	