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WENAS WILDLIFE AREA MANAGEMENT PLAN
Washington Department of Fish and Wildlife



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2006

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CHAPTER I. INTRODUCTION

The Washington Department of Fish and Wildlife (WDFW) is entrusted with the management of fish and wildlife, and on WDFW state-owned lands with the preservation of the natural resources associated with those properties. As a steward of the land, the WDFW is dedicated to protecting, restoring, and perpetuating healthy ecosystems throughout the state while fostering an attitude of partnership with the community. WDFW is responsible for the protection and management of all marine, anadromous and freshwater fish; shellfish; and terrestrial wildlife—thousands of animal species statewide. WDFW regulates all legal harvest of commercial fish, sport fish and wildlife, enforces wildlife protection laws, as well as managing about 840,000 acres of land.

WDFW developed Washington’s Comprehensive Wildlife Conservation Strategy as a guiding document to protect species from extinction. Included in that document are biodiversity protection measures along with species-specific protection measures. Many of the wildlife highlighted in this document occur on the Wenas Wildlife. The species accounts (Section 2.11) in the plan document basic information available so these species will not be left behind during management considerations. However, single species management may be highlighted as an emphasis in a particular area, while preserving basic habitat needs for overall species diversity as well. In other cases, wildlife biodiversity will be the emphasis for particular habitat types.

The Wenas Wildlife Area is located within the East Cascades and Columbia Plateau Ecoregions. Ecosystem assessments were used in providing guidance to the Comprehensive Wildlife Conservation Strategy development. The wildlife area plan utilizes both these documents in guiding management for the project.

This plan provides the specific management direction for the Wenas Wildlife Area. This plan will be updated annually to maintain its value as a flexible working document. It identifies needs and guides activities on the area based on the Washington Department of Fish and Wildlife (WDFW) Agency Mission of “Sound Stewardship of Fish and Wildlife” and its underlying statewide goals and objectives as they apply to local conditions.

1.1 Agency Mission Statement

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 fish and wildlife-related recreational and commercial opportunities.

1.2 Agency Goals and Objectives

The underlined goals and objectives directly apply to the management of this wildlife area. These goals and objectives can be found in the Agency’s Strategic Plan.

Goal I: Healthy and diverse fish and wildlife populations and habitats

- Objective 2: Protect, restore and enhance fish and wildlife populations and their habitats.
- Objective 3: Ensure WDFW activities, programs, facilities and lands are consistent with local, state and federal regulations that protect and recover fish, wildlife and their habitats.
- Objective 5: Minimize adverse interactions between humans and wildlife.

Goal II: Sustainable fish and wildlife-related opportunities

- Objective 6: Provide sustainable fish and wildlife-related recreational and commercial opportunities compatible with maintaining healthy fish and wildlife populations and habitats.
- Objective 7: Improve the economic well being of Washington by providing diverse, high quality recreational and commercial opportunities.

Goal III: Operational Excellence and Professional Service

- Objective 11: Provide sound operational management of WDFW lands, facilities and access sites.

1.3 Agency Policies

The following agency policies provide additional guidance for management of agency lands.

- Commission Policy 6003: Domestic Livestock Grazing on Department Lands
- Policy 6010: Acquiring and disposing of real property
- Policy 5211: Protecting and Restoring Wetlands: WDFW will accomplish long-term gain of properly functioning wetlands where both ecologically and financially feasible on WDFW-owned or WDFW-controlled properties
- Policy 5001: Fish Protection At Water Diversions/Flow Control Structures And Fish Passage Structures
- Policy: Recreation management on WDFW Lands
- Policy: Commercial Use of WDFW Lands
- Policy: Forest Management on WDFW Lands
- Policy: Weed Management on WDFW Lands
- Policy: Fire Management on WDFW Lands
- Contract : Bonneville Power Administration (BPA) project number 2006-004-00 Wenas Wildlife Area

1.4 Wenas Wildlife Area Goals

Management goals for the Wenas Wildlife Area are to preserve habitat and species diversity for both fish and wildlife resources, maintain healthy populations of game and non-game species, protect and restore native plant communities, and provide diverse opportunities for the public to encounter, utilize, and appreciate wildlife and wild areas. Specific management goals and objectives for the Wenas Wildlife Area can be found in Chapter 3.

1.5 Planning Process

A multifaceted approach has been undertaken to identify strategies proposed for management of the Wenas Wildlife Area. This process included identifying agency and BPA goals and objectives that apply to the area; a review of the purpose for purchasing the area; a review of existing habitat conditions and species present; the formation of a Wildlife Area Citizens Advisory Group (CAG); and input and review by an internal District Team consisting of local agency representatives from each agency program. The district team also helped to identify other species or habitat plans and documents pertinent to the management of the area.

Public participation, through the formation of the CAG, will be used as an ongoing means to identify social, cultural, and economic issues important to the people of Washington and the management of the wildlife area. The group will also provide input to help resolve current and future management issues and conflicts. CAG participation in planning will add credibility and support for land management practices and help build constituencies for wildlife areas. The CAG is made up of one representative from each major stakeholder group. CAG members are spokespersons for their interest groups.

Table 1. Colockum/L.T. Murray/Wenas/Oak Creek Wildlife Areas Citizens Advisory Group Representation.

| Name | Representing |
|-------------------|---|
| Bailey, Ken | Non-Motorized Recreation (hikers, horse backers, bicyclists, campers, cross-country skiing, kayaking, photographers, etc.) |
| Ballard, Shawn | Archery |
| Baskin, Tom | Disabled Recreators |
| Beck, Dan | Central Washington University (Biology) |
| Bloomfield, Betsy | The Nature Conservancy |
| Davis, Todd | Chelan, Kittitas, Yakima Co. Weed Boards |
| Eaton, Bob | Livestock interests |
| Essman, Bill | Kittitas Co. Field & Stream Club, and Hunting / Fishing interests |
| Forbes, Pete | U.S. Forest Service, Naches Ranger District |
| Fulwiler, Neil | Adjacent landowner |
| Hale, Mike | Rocky Mountain Elk Foundation/Mule Deer Foundation/ Foundation of North American Sheep |
| Hankins, Wes | National Wild Turkey Foundation / Bird Hunters / Hunting interests / Dog Training |
| Hedges, Neal | U.S. Bureau of Land Management (BLM) |
| Juette, Randy | Commercial Use / Tourism |
| Kinney, Dan | Audubon Society |
| McNamee, Ken | Department of Natural Resources (DNR) |
| Paolella, Ray | Cowiche Canyon Conservancy |
| Stegeman, Bill | Wenatchee Sportsman's Assoc. |
| Stephenson, Jim | Yakama Nation |
| Warnock, Doug | Big Game Management Roundtable |
| White, Bill | Land Management Advisory Council |
| Witke, Don | Wenas Muzzleloader Club |
| Zeimantz, Paul | Motorized Recreation (4 wheelers, motorcycles, jeeps, snowmobiles, boats, etc.), Washington State Snow Mobile Association, Washington State Parks |

Individuals representing these entities will provide input during the planning process.

Plans will incorporate cross-program input and review at the regional and headquarters level by the habitat program, wildlife program, enforcement program, and fish program. Pertinent information from existing species plans, habitat recommendations, watershed plans, ecoregional assessments, etc., will be used to identify local issues and needs and ensure that the specific Wildlife Area Plan is consistent with WDFW statewide and regional priorities.

The Wenas plan will be reviewed annually with additional input from the CAG and district team to monitor performance and desired results. Strategies and activities will be adapted where necessary to accomplish management objectives.

CHAPTER II. AREA DESCRIPTION AND MAP

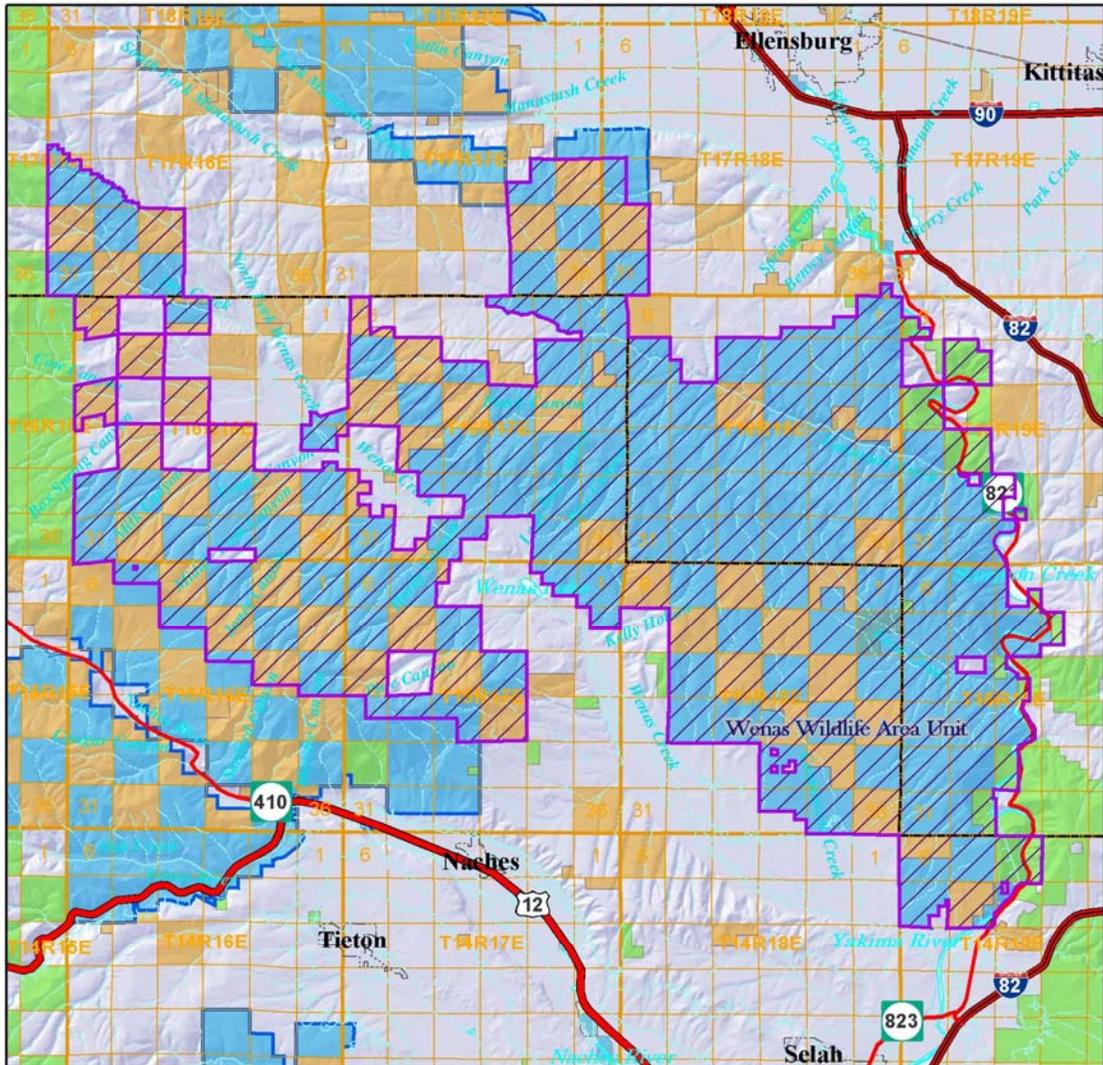
2.1 Property Location and Size

The 105,461-acre Wenas Wildlife Area, located in Yakima and Kittitas Counties, was created in 1997 by combining the Wenas and Cleman Mountain Units from the Oak Creek Wildlife Area (Wildlife Area) with the South L.T. Murray Unit formerly part of the L.T. Murray Wildlife Area. The entire Wenas Wildlife Area lies within the Yakima Sub-basin, and is comprised of lands owned by WDFW, DNR, and the BLM.

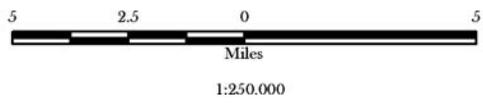
WDFW owns 70,093 acres, leases 16,514 acres of the 30,643 acres owned by the DNR, and manages 3,485 acres for the BLM. For the purposes of this planning document, the Wenas Wildlife Area is divided into six management units (Unit); the 31,249-acre North Cleman Mountain Unit, the 35,400-acre South Umtanum Ridge Unit, the 12,876-acre Roza Creek Unit, and the 25,936-acre Umtanum Creek Unit.

Wenas Wildlife Area lands encompass all or portions of sections within T17N, R17E and R18E; T16N, R16E, R17E, R18E, and R19E; T15N, R16E, R17E, R18E, and R19E; and T15N, R19E.

Figure 1. Map of Wenas Wildlife Area



- | | | | |
|---|-------------------------------|-------------------------------|------------------------|
| Washington Department of Fish and Wildlife | Administrative Borders | Transportation Network | Hydrography |
| Wenas Wildlife Area | Township Line | Interstate Highway | Annual Stream or River |
| Wildlife Area Unit | Section Line | US Highway | Intermittent Stream |
| WA Dept of Fish and Wildlife Owned Land | Shore Line | State Route | Canal |
| Other Major Public Lands | County Line | | Shoreline |
| Federal Land | State Line | | Lake or Wide River |
| Other State Land | International Border | | |
| County Land | City or Town Limits | | |
| City Land | | | |
| Tribal Land | | | |



2.2 Purchase History and Purpose

The 31,249-acre North Cleman Mountain Unit is comprised of the north slope of Cleman Mountain, the North Fork Wenas Sub-unit, and the Mtn. Vale Ranch. The north slope of Cleman Mountain (22,832 acres) was part of the Bean Ranch acquisition in the late 1960s that also included Mtn. Vale Ranch. This sub-unit is comprised of open, shrub-steppe at the lower elevations, grading into broken timber and near the crest transitions to mixed conifer stands. It includes another old ranch property known as Mellotte. WDFW feeds up to 1,000 head of elk during the winter at this site. Most of the Mellotte area and other surrounding sub-unit land is shrub-steppe and managed as such for fish and wildlife habitat. In 1942 and 1951, the Department of Game purchased and exchanged perpetual timber rights (PTR's) with Cascade Lumber Company for 10,182 acres and 12,353 acres, respectively, in the Bethel Ridge and Cleman Mountain areas. These lands provided the Department additional low elevation deer and elk winter range, in exchange for the timber resources on these lands in perpetuity. The PTR's are currently owned by Western Pacific Timber, LLC. The North Fork Wenas Sub-unit (8,200 acres) is comprised of private property acquired by WDFW in 1995 from the Coffin family and WDNR lands. The majority of the property is forested with North Wenas creek as the northern boundary and the Dry creek drainage flowing through the center of the property. WDFW owns the timber rights on the former Coffin sections, but no timber harvest has occurred since acquisition. The Mt. Vale Ranch, once known as the Bean Ranch, was the headquarters for a major cattle operation. Livestock from this ranch grazed much of the Wenas valley. Historically, agricultural fields located on both sides of Wenas creek were used for hay production and/or pasture for the livestock operation. Similarly, when acquired by WDFW in the late 1960's, hay production was maintained for WDFW's winter elk feeding program until Mtn. Vale became the headquarters for the Wenas Wildlife Area in July of 1998. The agricultural fields (200 acres) were seeded to native grasses, forbs and shrubs in late Fall 1998. Subsequent weed control activities are ongoing. Past timber harvesting practices and relatively unrestricted vehicle use of numerous unimproved roads has resulted in establishment of major weed infestations along road right-of-ways, log landings and other disturbed soil sites throughout the Unit. There is currently no livestock grazing on lands owned and/or managed by WDFW within the North Cleman Mountain Unit.

The 35,400-acre South Umtanum Ridge Unit was established by combining the McCade parcel, from the Oak Creek Wildlife Area, with the Cottonwood unit, formerly part of the L.T. Murray Wildlife Area. Both of these areas were acquired by WDFW as part of larger land purchases in the mid to late 1960's. This Unit also had a long history of livestock grazing. One of the largest domestic sheep operations in the state was located in the Cottonwood Creek area where livestock grazing occurred throughout the year and livestock winter feedlots were prevalent. Past uncontrolled range fires have destroyed almost all of the former ranch buildings and livestock facilities with only a small storage barn remaining. Years of soil disturbance, uncontrolled vehicle use, and fires have all contributed to widespread weed infestations throughout the unit. Several enhancement and restoration projects have been implemented over the proceeding years to improve habitat quality for endemic wildlife species. Noxious weed control by mechanical, chemical, and biological means is ongoing.

The 12,876-acre Roza Creek Unit encompasses the Roza Creek watershed lying between North and South Umtanum Ridges, and was formerly managed as part of the L.T. Murray Wildlife

Area. Steep basaltic cliffs and rims rise above the Yakima River, which forms the east side of the Unit. Prior to WDFW taking ownership in 1968 and for several years thereafter, the Roza Creek Unit was heavily grazed. The long history of intensive year around livestock grazing resulted in extensive damage to riparian plant communities adjacent to Roza Creek. The creek bottom downcuts 10-15 feet throughout most of the drainage due to lack of vegetation. With the removal of grazing, disturbed soils became infested with noxious weeds including Russian knapweed. A restoration project has been implemented over the proceeding years to improve habitat quality for endemic wildlife species. Noxious weed control by mechanical, chemical, and biological means is ongoing.

The 25,936-acre Umtanum Creek Unit, formerly managed as part of the L.T. Murray Wildlife Area, encompasses approximately seventy-five percent of the entire Umtanum Creek watershed. Umtanum Creek runs for ten miles through the Unit, emptying into the Yakima River. Steep basaltic cliffs rise on both sides of the stream corridor. The narrow riparian forest zone adjacent to Umtanum Creek is comprised of Ponderosa pine, Douglas fir, black cottonwood, aspen and willows. The steep north-facing slope of Umtanum ridge forms approximately one half of the unit. The remaining half of the unit is very dry, which is characteristic of south facing exposures in this area. Except for the cliffs along Umtanum Creek and the Yakima River, the topography is not as steep as the north half of the unit. Prior to WDFW ownership the Umtanum Creek Unit was used primarily for livestock grazing similar to other Units within the Wenas Wildlife Area. With the exception of riparian areas, however, grazing impacts were not as pronounced as on other units due to the steep topography that exists on much of the area. Livestock grazing has not occurred, except for minor trespass incidents, since 1980 resulting in considerable recovery of the plant community.

2.3 Ownership and Use of Adjacent Lands

WDFW lands on the Wenas Wildlife Area are interspersed with DNR ownership, as well as some lands owned by private timber companies. To the north are a combination of more state ownership, private range and agricultural lands, and private timber interests. Ownership to the east is a combination of Bureau of Land Management (BLM), private commercial, and private residential. To the south lie agricultural lands, and more state interests. The western border is comprised mostly of U.S. Forest Service (USFS) and private property. Adjacent ownerships are managed for a variety of objectives, with the primary one on private land being commercial agriculture. WDFW, USFS, and BLM manage the lands for natural resource protection, and each has objectives for salmonid recovery, range condition, and wildlife management.

For over 35 years, WDFW leased approximately 125,000 acres of shrub steppe and partially timbered lands from the DNR. These lands are common school trust lands that are managed by DNR to generate revenue for school construction. The lands are intermixed with WDFW ownerships in Eastern Washington primarily on the Oak Creek, Wenas, L.T. Murray, Whiskey Dick, Quilomene and Colockum Wildlife Areas.

For the 2003-05 biennium, the Fish and Wildlife Commission was directed by the legislature to reduce funding for those leases by \$270,000/biennium as part of a much larger general fund reduction for the department. Although this reduction didn't affect the leases on the South Umtanum Ridge, Roza or Umtanum Creek Units due to funding for these leases being through

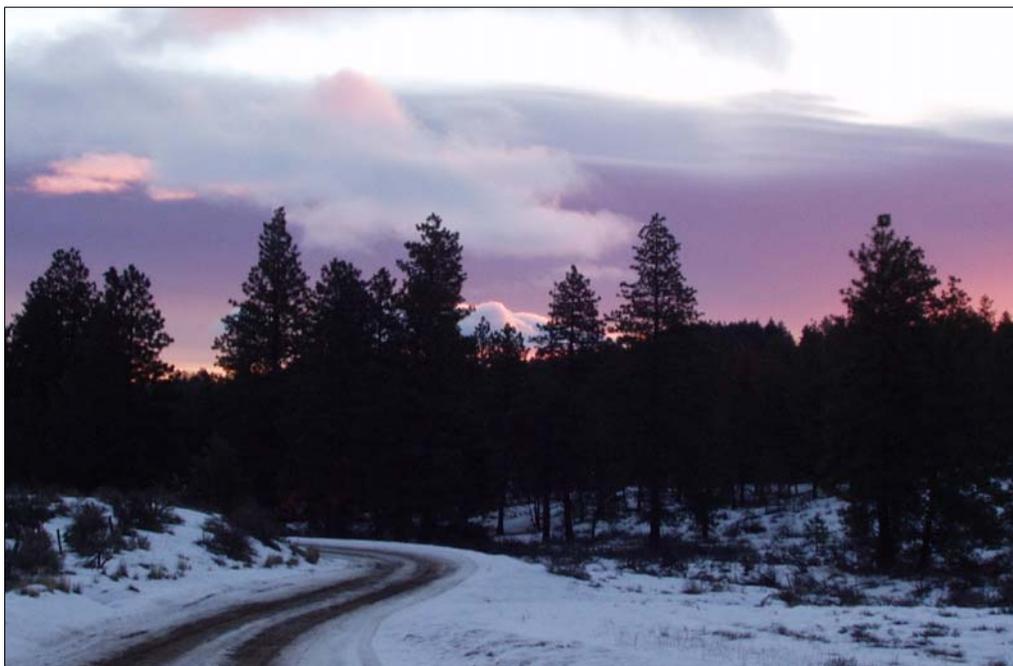
BPA, it did affect the North Cleman Mountain Unit as well as the DNR lands on the adjacent wildlife areas. That reduction significantly increased the risk to those lands of conversion, sale, exchange or lease for purposes potentially incompatible with fish and wildlife. To address this issue, the Fish and Wildlife Commission and legislature have approved a plan to exchange land between the two agencies. WDFW would trade mostly forested lands in Kittitas and Yakima counties to DNR in exchange for shrub-steppe lands.

The land exchange will allow both agencies to manage their properties more efficiently since it consolidates a large portion of their respective ownerships. It also significantly increases the certainty that ‘at risk’ shrub-steppe lands will be protected in perpetuity for fish and fish and wildlife and related recreation.

2.4 Funding

Bonneville Power Administration provides all funding, as part of its fish and wildlife mitigation program, of the South Umtanum Ridge Unit, Roza Unit, and Umtanum Creek Unit. The current funding level is approximately \$270,000 annually. This equates to **\$3.65/acre**. Future funding levels have not been determined. The North Cleman Mountain Unit is currently funded using Oil and Gas Lease Revenues in the amount of \$20,000 annually. Additional funds from project revenue are also available in some years for these non-BPA funded lands. The combined Pittman Robertson (PR) and state general funds provide **\$0.73/acre** for management of these lands.

The Department will, as part of the implementation of this plan, submit grant proposals and applications, and identify other strategies to address unfunded management needs on the wildlife area.



Early Evening Winter Scene

2.5 Climate

The climate is typical of that on the east slope of the Cascade Range, generally hot dry summers and cold wet winters. Elevation ranges from 1,200 feet to 4,100 feet. Total precipitation in the area varies from 6 to 25 inches per year, with much of it occurring as rain and/or snow during November through March. In winter, the average daily minimum temperatures in Yakima and Ellensburg are 23 and 20 degrees Fahrenheit respectively. The average daily maximum temperature in summer is 83 degrees Fahrenheit. Prevailing winds are from the northwest throughout most of the year.

2.6 Soils and Geology

Much of the land in all the units is very dry, which is characteristic of the predominantly south-facing exposures in this area. Except for the cliffs along Umtanum Creek and the Yakima River, most of the topography is not overly steep. The majority of the area is less than 3,000 feet in elevation. The unique soil formation, known as the Manastash Mounds, are found throughout lands lying south of Umtanum Ridge.

The parent bedrock material in the region consists of basalt rock, and includes fractured and folded lava flows. The basalt material has broken down into coarse gravels, cobbles, and boulders, with finer loams, silts and clays. Some of these are readily, even highly erodible, as are the fine-grained loess and volcanic ash deposits also found on the Wildlife Area. The folding of the bedrock caused uplift in the topography and over time stream channels cut through the fragile soils to form steep-sided, narrow canyons. Soils in the canyons can be shallow or deep, and formed from weathered basalt and loess.

2.7 Hydrology and Watersheds

The North Cleman Unit is drained primarily by Wenas Creek, and is fed by several smaller tributaries flowing southwest to northeast. These intermittent streams originate in canyons and draws, as do the ones (similar to Cottonwood Creek) that feed Wenas Creek from the north on the South Umtanum Ridge Unit. Numerous perennial springs are scattered throughout both units, although water is not well dispersed over the northern exposure of the South Umtanum Ridge Unit. Wenas Creek is fish bearing.

The entire Roza Creek watershed (lying between North and South Umtanum Ridges) is within the Roza Unit. Roza Creek is a small perennial, fish-bearing stream which flows for approximately four miles in a southeasterly direction into the Yakima River. Bordered by steep slopes and ridges on both sides, the creek bottom supports a narrow band of riparian shrub/forest habitat throughout its length. Lacking vegetation to slow water runoff into the creek and to reduce stream velocity, Roza Creek's stream channel has incised as much as 20 feet in places. Beginning in the mid-1990s, beaver moved into the drainage and have constructed multiple dams on the creek resulting in raising the water table, reducing water velocity, and began to "heal" the stream channel.

The Umtanum Creek Unit includes approximately 75% of the entire Umtanum Creek watershed. Umtanum Creek is fish bearing, including potential of threatened steelhead, and runs for ten miles through the unit before emptying into the Yakima River. Steep basalt cliffs rise on both sides of the stream corridor. The narrow riparian forest zone adjacent to Umtanum Creek is

comprised of Ponderosa pine, Douglas fir, black cottonwood, aspen and willows. Beaver are also active in this drainage.

2.8 Fire History

Past range fires on all the units have created a unique mosaic of grassland and shrubland habitats that are interspersed throughout the Wenas Wildlife Area. Over the past thirty years wildfires have burned close to 75% of the Roza watershed; portions of the Roza Unit have burned more than once. As a result, much of the shrub habitat has been converted to grassland. Riparian bottoms have also burned multiple times and are currently recovering from fire disturbance and past livestock grazing.

DNR is responsible for controlling fires on the forested lands. In addition, WDFW contracts with DNR on an annual basis to provide rapid air and ground response to wildfires on the non-forested areas on the Wenas Wildlife Area. This has eliminated large fires and major habitat losses for the past ten years. The Selah Volunteer Fire Department also provides assistance with fighting fires on the Wenas Wildlife Area.

Uncontrolled wildfires in shrub-steppe habitat can significantly alter the landscape by eradicating sagebrush which shrub steppe obligate species, such as sage grouse, sage thrasher, and sage sparrow, depend upon for both food and cover (big sagebrush, *Artemisia tridentata*, is killed by fire). Although native bunchgrasses are tolerant of low intensity fires, the invasion of noxious weeds such as various thistles, knapweeds, and cheatgrass have altered the nature of burns.

These weedy species grow in dense stands, filling interspaces between bunchgrasses, and fuel intense fires that kill native forbs and grasses. Weedy invaders tend to out-compete some native species after a fire and spread readily throughout burned areas, thereby converting native communities to entire stands of exotics that are less palatable to wildlife and diminish the diversity of the plant community. It has been the management policy on the wildlife area to follow a wildfire event with the planting of native species of grasses and forbs in areas vulnerable to invasion by weeds.



Shrub-steppe in Roza drainage

2.9 Vegetation Characterization

Much of the Wenas Wildlife Area is dominated by shrub-steppe vegetation. Present habitat conditions were influenced, primarily by past agricultural practices, extensive livestock grazing, and fires. Prior to WDFW's ownership, lands with flat topography containing decent soil types were converted to agricultural fields, as attempts were made to farm these fields with little to no irrigation. Livestock grazed the majority of the areas that were not farmed.

Grasslands and shrub-steppe communities, interspersed with rock outcrops, dominate the hillsides. Common shrub species are sagebrush, bitterbrush, snowberry, rose, serviceberry, elderberry, and several currants. Forest vegetation types exist at higher elevations. The dominant tree species on south slopes is Ponderosa pine, but north slopes and wetter valleys contain a mix of species such as Douglas fir, grand fir, Ponderosa pine and western larch. These dense stands of trees and/or shrubs provide hiding, escape and thermal cover, shade, foraging and nesting sites, perches, and water sources. Often these highly productive communities contain both plant and wildlife species that are endangered or threatened. Common overstory trees in riparian zones include black cottonwood, aspen, and water birch, while the understory vegetation is composed of many hydrophytic shrub species such as mock orange, alder, Rocky Mountain maple, black hawthorn, and willow.

2.10 Important Habitats

Steep and rocky hillsides and cliffs characterize some of the higher elevations, and the transition from shrub-steppe into forest makes for a wide range of diverse habitat for many species of wildlife.

Shrub-steppe – Although some areas have been altered due to past livestock grazing, the Wenas Wildlife Area still exhibits quality native shrub-steppe communities (predominantly sagebrush and/or bitterbrush mixed with various bunchgrasses). Certain portions exhibit some of the state’s best remaining native shrub-steppe communities. This cover type will be significant in WDFW’s future sage grouse restoration efforts.

Talus/Cliffs – Areas of exposed rock or fields of broken rock are common in the transition zones between lower elevation shrub-steppe, and forested land. These landscape features provide key habitat requisites that are often missing for various species such as bighorn sheep, golden eagles and peregrine falcons.



Riparian Habitat

Riparian – The Wenas has extensive riparian habitat in the North Wenas and Dry creek drainages as well as the Umtanum drainage. Riparian habitat is recovering in the Roza drainage and in the smaller drainages along the face of Cleman Mountain and Umtanum Ridge. This cover type is a primary factor influencing the quality and health of fish habitat. Riparian vegetation provides thermal cover, creates stream channel features such as pools, maintains stream bank stability and is an important habitat for sage grouse.

Forest – The majority of the forest habitat is found within the North Cleman Mountain Unit, with species dominated by Ponderosa Pine and fir.



Yakima River Canyon

Riverine – Approximately 12 to 15 miles of the eastern border of the wildlife area runs along the Yakima River.

2.11 Fish and Wildlife

Fish and wildlife diversity is of primary importance to the goals and strategies guiding WDFW's management efforts. The protection and enhancement of fish and wildlife and their habitats is the number one priority when developing management strategies on the Wildlife Area. Wildlife use is diverse, with species present including elk, deer, big horn sheep, sage grouse, turkey, quail, and a myriad of small mammals, neo-tropical/upland birds, raptors, and reptiles. There are numerous fish-bearing streams on the Wildlife Area, including Umtanum creek, which is accessible to steelhead. Additionally, there are streams and their tributaries that historically contained anadromous stocks that are currently federally listed. WDFW and other state and federal agencies are actively pursuing the removal of barriers from these streams to re-establish anadromous use. Great care is taken so that fishery resources are not impacted by management practices. The Wenas Wildlife Area is dedicated to the management and protection of its habitat and wildlife species.

Rocky Mountain Elk

Elk are the second largest wild ungulate residing in Washington State. Zoo archaeological data from the Columbia Basin suggest elk were present and utilized by early inhabitants (Dixon et al. 1996 and McCorquodale 1985). As late as the 1800's, elk may have been extirpated from the central Washington region (McCorquodale 1985). The current Yakima elk herd developed from the re-introduction of Rocky Mountain Elk from Yellowstone National Park in 1915 (Bryant and Maser 1982 and Pautske 1939).

The Wenas Wildlife Area is used by the Yakima elk herd (Game Management Units (GMU) 340 and 342) at various levels throughout the year, but most notably during the winter months. A feeding operation is in place from snowfall to spring at the Mellotte feed site. Free ranging elk use winter range from the Yakima Canyon west to the foothills in the upper basin from before snowfall until after green-up is occurring in the upper reaches of the basin. This area is critical for long-term management of the elk herd. Plans for maintaining target herd numbers, managing hunting seasons, and addressing depredation problems on neighboring lands, etc., are addressed



Winter Feed Site

in the 2002 Yakima Elk Herd Plan. Additional work to solve problems created by elk on private ownership is being completed by a Kittitas County group called the Big Game Management Round Table. This group is a cross section of farmers, ranchers, concerned citizens, and various agency people who have come together to seek solutions to the continuing problem of agricultural damage to private interests by elk. Also, the Rocky Mountain Elk Foundation is currently developing an East Slope Conservation initiative. The

goal of this process is to produce a series of conservation strategies for the East Slope Cascades region that are shared by the majority of stakeholders and to lay out a plan for action associated with each strategy.

The Yakima Elk Herd plan (2002) currently has elk herd objective goals of 9,500 elk while the 2003-2009 Game Management Plan has a range of 9,025-9,975 elk. These plans provide detailed guidance in herd management. The Wenas Wildlife Area Plan and Yakima Elk Herd Plan will have interactive management to insure both are in alignment. Ensuring habitat protection, habitat enhancement and limiting human disturbance are critical functions the Wildlife Area Manager will have to deal with for both plans to be successful. Specific items in need of management actions include: livestock grazing, vehicle access, fire protection, old agricultural fields, noxious weed and human access.

A current study by WDFW of the Yakima Elk herd is nearing completion that will identify distribution and seasonality of use, and is directed at identifying what habitats are most important and how elk use the range with regards to habitat and human use. A concurrent study is underway by the USFS dealing with the habitat components of forest that is a critical component of these efforts.

How elk use forage and cover depends on the season, land use influences, and human disturbance. Elk need forage and water year around but use it differently during spring, summer, fall and winter in relation to weather conditions and particularly human disturbance. Habitat and human disturbance influence where and how often elk will use various areas. All these factors play into the management activities for successful elk management.

Rocky Mountain Mule Deer

Mule deer have been an important member of eastern Washington's landscape, serving as a food and clothing source for Native Americans prior to settlement by Euro-Americans. Today mule deer remain an important component of the landscape, providing food for Native Americans, recreational opportunities for hunters and wildlife watchers, and tremendous economic benefits

to local communities and the state of Washington. Mule deer range throughout the Wenas Wildlife Area (GMUs 340 and 342), and occupy various habitats from Ponderosa pine zones, to the shrub-steppe/grassland habitats along the eastern fringes next to the Yakima River. Summer range consists of bunchgrass communities interspersed with forest stands that provide fawning and hiding cover in the western part of the wildlife area. The eastern part of the Wenas provides winter and spring forage in the form of bunchgrass, forbs and particularly Sandberg's bluegrass communities.

The most important habitat factors affecting deer in these areas are the availability of suitable forage to survive harsh winter conditions and spring green up in preparation for fawning time.

Developments in the upper portion of the basin has been impacting intermediate transition range and will continue in the future altering the amount of habitat available and how mule deer will use this range in the future. Management of the wildlife area will become increasingly important to help offset some of these affects or at the very least protect some of the most critical assets (habitat) for mule deer as well as other wildlife. Mule deer are identified as a focal species for the wildlife area under BPA funding.

California Bighorn Sheep

Bighorn sheep were native to Washington and archeological evidence showed they inhabited the uplands throughout the Yakima and Columbia River areas. Bighorns were extirpated from Washington around 1930 and efforts to bring them back were initiated in the 1950s and continue to this day.

Washington State has approximately 1,100 bighorn sheep (*Ovis canadensis*) distributed in 16 herds. Within those herds, 11 herds are California bighorn sheep and five are Rocky Mountain bighorn sheep. Populations are stable to increasing in 11 herds, and declining in five herds, where diseases and parasites are the primary causes for decline (WDFW 2003, Game Mgmt. Plan).

The Umtanum bighorn sheep herd was one of the first herds re-established with the release at the mouth of Umtanum Creek of eight animals transplanted from the Colockum bighorn sheep herd in 1972 (Wash. State Mgmt. Plan for Bighorn Sheep 1995). The population has fluctuated between 170 and 250 animals since 1989, with an upward trend. The herd objective is 250-300 animals (2004 Bighorn Sheep Status and Trend Report), and nearly 300 were counted in the summer of 2005, making them one of the largest bands in the state. Sheep from this population spend time on both the east and west sides of the Yakima River. The cliffs and rims along the Yakima River and Umtanum Creek provide the sheep excellent lambing/rearing habitat, ample forage, as well as security and thermal cover. Most of the land on the east side is in private ownership while most of the west side is public ownership. In order to keep bighorn numbers at a tolerable level for the private landowner bighorns have been removed and used for re-introductions in other areas. Habitat enhancements on the west side will hopefully induce animals to spend more time on public lands.

Bighorns utilize steep cliffs, rock outcrops and talus slopes for security and surrounding grasslands for forage along this section of the river. The threat of most concern continues to be a

disease outbreak from domestic sheep, which are carriers of the disease but are not hampered by it. The USFS, Naches Ranger District, has three domestic sheep allotments. Bighorn rams are known to wander but at this point little is known if bighorns from this population are coming in contact with domestic sheep. The Umtanum sheep herd has three distinct groupings. The west side near Umtanum Creek, the east side near Llumma Creek (Squaw Creek) and the southern portion below Roza Dam. Habitat (cliffs) voids occur at the mouth of Roza Creek that limit sheep movements from the north to the south. Several re-introductions were conducted in the 1990's that allowed a separate sub-herd to establish. These separate niches help with limiting the spread of disease should an outbreak occur, and should help with re-establishing decimated herds should they occur in the future.

Merriam's and Rio Grande Turkeys

Merriam's turkeys were first introduced in various areas of the region in the 1960's. Rio Grande turkeys were released in the 1980's. Turkey's with mostly Merriam's but some Rio Grande traits were released in the 1990's. The population has grown significantly with turkeys expanding into the L.T. Murray and becoming a highly sought after game bird. Current distribution is not well known for the L.T. Murray but sightings have shown flocks appearing in the eastern portion during winter periods. It is likely they are scattered throughout the area during mild weather periods as well. Some controversy surrounds the establishment of this game bird with concerns that they eat native species of invertebrates. The literature does make reference to turkeys eating insects and mollusks (Korschgen 1967) but to date no studies have been conducted on turkey diets in Washington to determine their dietary preferences or what impacts they may have on native populations of invertebrate. Turkeys are known to subsist on mast producing plants during the fall and winter months and they rely on insects, forbs and succulent grasses during the spring and summer as well.

Sage Grouse

Sage grouse numbers have dramatically declined from recent history and are listed as a Washington State Threatened species. They are listed as a federal candidate species by the U.S. Fish & Wildlife Service (USFWS). Sage grouse inhabited the sage steppe communities of eastern Washington and were considered widespread but with the advent of agricultural development, overgrazing and wildfire it is approximated over 92% of the historical habitat has been lost (Stinson, et al. 2004). The remaining populations exist in Douglas County residing on mostly private property where the Conservation Reserve Program (CRP) has allowed habitat to recover in Kittitas County, and in Yakima County residing mostly on the U.S. Army Yakima Training Center. Although the Wenas Wildlife Area does not support large numbers of sage grouse, they historically occupied leks on the Mellergaard unit of L.T. Murray and Hanson Pond unit of the Wenas Wildlife Area, with some reports of leks to the south near the Cottonwoods and Roza creeks. Heavy cattle and sheep grazing in the past likely limited sage grouse use of the area. Fires in the 1980's removed most of the critical sagebrush components for long-term use by sage grouse. Occasional sightings of sage grouse still occur on the Wenas segments to this day. The State of Washington Greater Sage Grouse Recovery Plan (2004) identifies protecting the remaining habitat and restoring degraded habitat and re-establishing populations outside their current range as key to maintaining sage grouse populations in Washington. Sage grouse are identified as a focal species under BPA funding.

Chukar

Chukar is an exotic game bird introduced in the 1930's and has been very successful. They are highly sought after by sportsmen throughout the western United States. Land on the eastern border, particularly the Yakima River and Umtanum Creek Canyons, support the best Chukar habitat in the area. Hunter access is readily available and receives high hunting pressure throughout the hunting season. Chukar prefers deep river canyons with rocky terrain for security and water. They feed on grasses of the arid region as well as seeds, forbs, shrub fruits and insects. Weather extremes, particularly deep snow, can influence population levels (Christensen, 1996).

Forest Grouse (Blue & Ruffed)

Blue and Ruffed grouse are the more prominent grouse species on the Wenas Wildlife Area, and are the ones for which early season hunting affords the most opportunity. Although surveys have not been conducted to monitor populations statewide, harvest trend data suggests a decline in forest grouse populations since records have been kept in the early 1960's (Game Mgmt. Plan, 2003). Blue grouse require succulent vegetation adjacent to water sources during the breeding season and have strong site fidelity to wintering areas (Cade 1984). They may select more mature trees for roosting (Cade and Hoffman 1990). Forbs and grasses are major food sources in the diets during summer months while fir species are primary items in the winter. Habitat management requires a mix of dense conifer stands for wintering habitat while providing open areas for breeding and brood rearing. Logging and fire creates open stands in lower elevations and allows forbs and grasses to increase. Care should be taken not to overgraze the same area thereby reducing the amount of forage available (Rodrick & Milner, 1991).

Golden Eagle

Golden eagles are listed as a Washington State Candidate species. They require large open areas for feeding and generally nest on cliffs or in large trees (Anderson & Bruce 1980). Home range size depends on the amount of prey and prey habitat available. They use the same territory annually but may use alternate nests in different years. On the Wenas Wildlife Area there is one active territory and several historic territories that had been active in the past. The main territory has been occupied with moderate-high success for the years monitoring has occurred. Territories often have more than one nest where eagles can alternate nest selection from one year to the next.



Golden Eagle

This scenario is thought to help with lowering predation and limiting the amount of insect infestation on young chicks. Disturbance has occurred in the past likely causing abandonment of the site for those years. Human disturbance has resulted in access restrictions of some cliff habitats during courtship and nest-building activities. If birds are not found on these territories by the advent of incubation, these restrictions are lifted and recreational activities are allowed to resume as early as possible that year. Limiting factors can vary with regard to the success of individual sites. The main threats to golden eagles are most likely human disturbance and contaminants. Golden eagles main prey source is probably California ground squirrels, chukar, and big game carrion. Jack-rabbits, Townsend ground squirrels, sage grouse and marmots were probably utilized historically, but are not as common today.

Recreational and commercial activities adjacent to nests should be evaluated for potential disturbance and the need for restrictions to ensure nest success.

Bald Eagle



General range of the bald eagle, *Haliaeetus leucocephalus*, in Washington (Washington Department of Fish and Wildlife, unpublished data).

The following was taken from Stinsen et al.

The early summer population of bald eagles when white settlers first arrived in Washington may have been around 8,800 based on presumed habitat condition. Persecution, the cutting of forests, commercial exploitation of salmon runs, and finally the use of DDT reduced the state's population to only 104 known breeding pairs by 1980. Loss of wetlands, contamination of estuaries, and declines in water quality also reduced the carrying capacity for eagles. The erection of >1,000 dams and the introduction of warm water fishes, however, may have added nesting and wintering sites and produced changes in local distribution and abundance of eagles. The population has recovered dramatically with the ban on DDT use after 1972, and increased protection for eagles and eagle habitat. In the past 25 years, the population of nesting bald eagles grew about 9% per year as eagles reoccupied habitat. In 2005, there were 840 occupied nests, and there are some indications that the population may have reached carrying capacity in parts of western Washington. The population may still be increasing in northeastern Washington and along some western Washington rivers. Though the nesting habitat may be near saturation around Puget Sound and other marine coasts, the total late spring/early summer population is expected to continue to grow with an increase in the pool of non-breeding adults until all available food resources are exploited. If there is no decline in the number of nest sites, productivity, or survival, the population may stabilize around 6,000 eagles.

The number of bald eagles detected during winter surveys in eastern Washington doubled between 1975 and 1984. A comprehensive, statewide survey of wintering eagles from 1982-89 counted 1,000-3,000 eagles in the state. The increasing trends in those surveys and in resident breeding birds predicted a population of 3,200 winter visitors and a total winter population of about 4,500 bald eagles in Washington in the year 2000; this assumed that winter carrying capacity limits have not been reached. Statewide winter counts have not been conducted since 1989, and the carrying capacity is unknown. The number of resident breeders and trends in localized winter counts suggest that Washington hosts perhaps 3,500 – 4,000 bald eagles each

winter. Up to 80% of the eagles seen in mid-winter in Washington consists of migrants, largely from the Canadian provinces and Alaska. Wintering eagles will most benefit from protection of salmon runs and communal roosts, and managing human disturbance at eagle concentration areas.

Wintering Bald Eagles on the Wenas Wildlife Area are well distributed throughout the area most often scavenging on winter kill big game, as well as along the Yakima River feeding on fish and waterfowl when available. There has been no documented nesting on the Wenas Wildlife Area to date, however an increased presence of individual eagles summering in the area may result in nesting in the near future. Management emphasis is directed at habitat protection and regeneration that provides a prey source and protection of potential nesting structures.

Ferruginous hawk



Breeding range of the ferruginous hawk, *Buteo regalis*, in Washington. Map derived from WDFW data files and GAP Analysis of Washington (Smith et al. 1997).

Most of the following information was taken from Richardson, et al 1999. Ferruginous hawks inhabit the arid, open country of 17 western states and three Canadian provinces during the breeding season. They winter primarily in Mexico and the southwestern and south central United States (Amer. Ornith. Union 1983, Olendorff 1993).

Ferruginous hawks breed in the Lower Columbia Basin and surrounding arid lands of southeast Washington. The Washington breeding range includes Adams, Benton, Columbia, Douglas, Franklin, Garfield, Grant, Kittitas, Lincoln, Walla Walla, Whitman, and Yakima counties.

The ferruginous hawk, a State Threatened species, is an uncommon breeding species and rare winter visitor east of the Washington Cascades (Washington Department of Fish and Wildlife 1996). The ferruginous hawk is a Federal Species of Concern. Uncultivated land is a major component of ferruginous hawk habitat (Lokemoen and Duebbert 1976; Schmutz 1984, 1987; Olendorff 1993). Loss of uncultivated land and the prey base it supports (Howard and Wolfe 1976, Woffinden and Murphy 1977) may limit the frequency and success of ferruginous hawk nesting efforts. This species is also sensitive to human disturbance, particularly early in the breeding cycle (Smith and Murphy 1978, Schmutz 1984, White and Thurow 1985, Olendorff 1993). The amount of undisturbed natural habitat within the ferruginous hawk's Washington range has been reduced, which may make the population vulnerable.

Ferruginous hawks are obligate grassland or desert-shrub nesters (Woffinden and Murphy 1989, in Richardson et al). In Washington, they frequent shrub-steppe in the channeled scablands, as well as juniper-savannah areas of the Columbia Basin and nest on rock outcrops, steep low cliffs, ledges on hills, in some canyons, in isolated trees [juniper (*Juniperus* spp.), black locust (*Robinia pseudoacacia*) and others], and on powerline towers or other artificial structures (WDFW, 1996).

Ferruginous hawks are sensitive to disturbance; pairs may abandon nests even when mildly disturbed during nest building or incubation (1 March through 31 May) (Smith and Murphy 1978, White and Thurow 1985, Olendorff 1993, Washington Department of Fish and Wildlife 1996). Furthermore, disturbed nests fledge fewer young, and they often are not reoccupied the year following disturbances (White and Thurow 1985). Rather than becoming acclimated to repeated disturbance, ferruginous hawks become sensitized and flush at greater distances (White and Thurow 1985), which may result in increased clutch or brood mortality due to exposure, predation, starvation, or nest desertion.

On the Wenas Wildlife Area, sightings of this raptor are rare but not impossible considering their foraging range during breeding or dispersal after fledging. Nesting has not been documented on the Wenas but as recently as the mid 1980's they nested within one mile of the Wildlife Area on the Yakima Training Center (WDFW, 2009). Prey source can vary depending on location and variety of mammal species present. Mammals make up the highest percentage of the diet. In Washington management emphasis appears to be strongly correlated with high densities of ground squirrels and/or pocket gophers that provide a prey source. Historically jackrabbits were often a main diet when populations were high (WDFW 1996). Nesting most often occurs on the ground or rock outcrops and on cliff ledges that provide a platform that will hold a nest, in addition, man-made structures have been used when available in undisturbed sites (WDFW 1996). Maintenance of shrub-steppe habitat affords the best opportunity to provide for this species (WDFW 1996). Likelihood of nesting ferruginous hawks on the Wenas WA is low considering the diminishing numbers of birds in the Washington population.

Flammulated Owl



General range of the flammulated owl, *Otus flammeolus*, in Washington. Map derived from GAP Analysis of Washington (Smith et al. 1997).

The following information was taken from: Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By David W. Hays and Elizabeth A. Rodrick. Flammulated Owl *Otus flammeolus*. Last updated: 2003.

The flammulated owl is listed as a Washington State candidate species. Research has been limited, but indicates that demography and life history, in addition to narrow habitat requirements, make this species vulnerable to habitat alterations (Ashley and Stovall 2004). The flammulated owl occurs mostly in mid-level conifer forests between 1,200 to 5,500 feet elevations, containing a significant Ponderosa pine component (McCallum 1994). It is a small, nocturnal, insectivorous owl that preys on grasshoppers, moths, and beetles (Groves et al 1997). These owls are obligate secondary cavity nesters, and prefer large Ponderosa pine snags for nesting and roosting (McCallum 1994). Activities such as intensive forest management, forest stand improvement, and the felling of snags and diseased trees for firewood remove many cavities suitable for nesting (Reynolds *et al.* 1989). Wildfire suppression has allowed many Ponderosa pine stands to develop into more shade tolerant fir species less suitable as Flammulated owl habitat. Flammulated owls are closely associated with medium to large, multi-story, moderate to closed canopy Ponderosa pine forests, or medium to large multi-story/open canopy forests. Of the three Ponderosa pine focal species, flammulated owls are the most structurally dependent (Ashley and Stovall 2004). The owls nest primarily in cavities excavated by flickers (*Colates* spp.), hairy woodpeckers (*Picoides villosus*), pileated woodpeckers (*Dryocopus pileatus*), and sapsuckers (*Sphyrapicus* spp.) The Wenas WA is situated within the Ponderosa Pine zone where Flammulated owls are likely to occur. Most of the older timber stands that would support these owls have been removed, however individual trees and snags remain that are critical to continued existence on the wildlife area. Now that PTR's have been acquired management emphasis for this species is more attainable however, availability of suitable nest cavities and/or arthropod prey in ponderosa pine or mixed conifer forests are likely limiting.

Flammulated owls are presumed to be migratory in the northern part of their range (Balda et al. 1975), and winter migrants may extend to neotropical areas in central America. Flammulated owls are entirely insectivores; nocturnal moths are especially important during spring and early summer (Reynolds and Linkhart 1987). As summer progresses and other prey become available, lepidopteran larvae, grasshoppers, spiders, crickets, and beetles are added to the diet (Johnson 1963, Goggans 1986); (WDFW, PHS Vol. IV).

Creation of large areas of even-aged forests are likely detrimental to flammulated owls. Uneven stands of open mature and old forest located near brushy clearings provide good habitat for flammulated owls. The selection of mature to old-growth Ponderosa pine/Douglas-fir forests in areas where owls have been studied throughout the west indicates that this habitat may also be important in Washington. Bull et al. (1990) suggests leaving large snags and trees (>50 cm [20 in] dbh and 6 m [20 ft] tall) along ridge-tops, and south and east facing slopes in Ponderosa pine/Douglas-fir or grand fir forest types. Reynolds (personal communication) recommends leaving at least 5 snags/ha (2/ac) in Ponderosa pine habitat (WDFW, PHS Vol.IV).

Future nest snags should be recruited by continually retaining large, mature trees in or adjacent to suitable flammulated owl habitat (Marcot and Hill 1980). Where snags are lacking, large trees can be topped to promote woodpecker use and cavity formation. Fuelwood collection should be

limited where flammulated owls occur because this practice eliminates nest snags. Areas with brushy understory vegetation may provide insect prey and feeding cover when flammulated owls forage near the ground. Therefore, forest practices (e.g., application of herbicide) that remove brush from clearings adjacent to flammulated owl territories should be avoided (WDFW, PHS Vol. IV).

Northern goshawk



Shaded areas contain the general forest conditions that could provide potential suitable habitat for the northern goshawk (*Accipiter gentilis*) in Washington.

The following information was taken from: Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By Steven M. Desimone and David W. Hays. Northern Goshawk *Accipiter gentilis*.

Northern goshawks can occur in all forested regions of Washington. As of 2003, there were 338 documented breeding territories in the state (Washington Department of Fish and Wildlife [WDFW], unpublished data). The exact number is not known, because monitoring is not currently being conducted. The number of historical breeding sites lost due to habitat alteration and the number of new territories in suitable habitat are also unknown. About 50% of the documented breeding territories occur in the eastern Cascades, 27% in the western Cascades, 12% in other forested areas of northeast and southeast Washington, and 10% in the Olympic Peninsula (WDFW, unpublished data). Breeding birds formerly occurred in the Puget Trough (Jewett et al. 1953). Less than one percent of recent breeding records have been recorded from this area and southwest Washington (south of the Puget Sound and west to the coast). Wintering goshawk populations in Washington include resident birds (Bloxtton 2002; WDFW, unpublished data) and migrants that move into the state during winters when food shortages occur in their territories (Squires and Reynolds 1997). Overall, densities of territorial pairs in Washington appear to be lower than elsewhere in the western United States but this is partly dependent on habitat quality.

The northern goshawk is a Federal Species of Concern and State Candidate species in Washington because of concerns about its population status. Although a decline in populations of northern goshawks has been suggested based on reduced nesting in areas of extensive harvest of

mature forest (Crocker-Bedford 1990, 1995; Ward et al. 1992), Kennedy (1997) found no evidence to support the contention that goshawk populations in the western United States were declining, increasing, or stable. Kennedy (1997) acknowledged, however, that population declines might not be apparent due to insufficient sampling techniques. In Washington, goshawks appear to have been largely extirpated from urbanized landscapes and from some areas that are moderately developed or intensively managed for timber on short rotations (WDFW, unpublished data). There are no studies evaluating the population status of the goshawk in the Pacific Northwest. Because goshawks build multiple nests within nesting territories that are often used by other raptor species (Moore and Henny 1983, Buchanan et al. 1993; S. Desimone, unpublished data), the loss of goshawks might indirectly affect other forest species.

Management Recommendations (WDFW, PHS VOL. IV)

- Protect at least three nest areas and three alternate nest areas per home range. Each nest area should be at least 12 ha (30 ac) in size, and selected nest areas should be structurally similar to known nest areas.
- Minimize human disturbance in active nest areas between March 1st – September 30th.
- Retain an average canopy closure of 70-80% and maintain forest in late stages of forest development.
- Limit all overstory or regeneration harvest and increase harvest rotation length in nest area clusters.
- Delineate and center areas to be managed as post-fledging family area (PFA) on active and alternate nests. PFAs should be approximately 170 ha (420 ac) and include as much old and mature forest as possible.
- Manage PFAs for > 70% canopy closure in western Washington and for moist forests east of the Cascade crest. Drier forests east of the Cascade crest should have > 60% canopy closure.
- Avoid removing late-seral forest in PFAs, and retain snags and downed logs.
- Retain at least 60% of foraging habitat in mid-aged (20%), mature (20%), and old (20%) forest successional classes. Large diameter snags and logs should be retained in goshawk foraging areas.
- Retain at least 5 large (> 46 cm dbh [18 in], > 9.1 m [30 ft] in height) snags/ha (2 large snags/ac), and at least 7 large (> 30 cm [12 in] diameter, > 2 m [7 ft] in length) downed logs/ha (3/ac) in foraging areas comprised of Ponderosa pine forest in eastern Washington. At least 7 large snags/ha (3/ac) with at least 12 large downed logs/ha (5/ac) should be retained in interior-fir forests.
- Conservation of goshawk habitat should be managed on a landscape-scale and multiple spatial scales (e.g., watershed, forest-wide, territory, etc.)
- Forest management should consider increasing timber harvest rotations (e.g., 70-120 years in western Washington lowlands and Olympic peninsula) because intensively managed forest appear to negatively impact goshawks.
- Thin young (30-35 years) conifer stands to a density of 345-445 trees/ha (140-180/ac) to promote the development of nesting habitat in western Washington. If allowed to mature beyond 50-70 years, this practice should result in preferred forest conditions.

Peregrine falcon



Washington distribution of the peregrine falcon, *Falco peregrinus*. Dark shading indicates breeding areas. Light shading indicates wintering areas. Map derived from Washington Department of Fish and Wildlife data files.

The peregrine falcon is a State Endangered species. Peregrine falcon populations have increased in Washington since chlorinated hydrocarbon pesticides were banned in the United States, and through the success of reintroduction programs. Their numbers and distribution are still limited however, due primarily to the lingering effects of pesticides and the lack of suitable nesting sites (WDFW, PHS, Vol. IV). Peregrine falcons occur nearly worldwide. In Washington, nesting may occur in all but the driest parts of the state. Naturally occurring breeding sites are verified along the outer coast, in the San Juan Islands, and in the Columbia Gorge. Young birds have been introduced in unoccupied historical habitat in Skamania, Lewis, Spokane, Asotin, and Yakima counties.

Although nesting and rearing habitats are represented on portions of the Wenas WA, there are no documented breeding pairs of peregrine falcons to date. There have been individual sightings mostly occurring during migration or wintering. The habitat requirements and management strategies for these birds are both well documented in the literature. Although peregrines were recently down listed from the endangered species list they remain a high priority species for the State of Washington and specific management strategies will be implemented if breeding peregrines inhabit the Wildlife Area in the future.

Pileated woodpecker



General range of the pileated woodpecker, *Dryocopus pileatus*, in Washington (Smith et al. 1997).

The following information was taken from: Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By Jeffrey C. Lewis and Jeffrey M. Azerrad. Pileated Woodpecker *Dryocopus pileatus*.

The pileated woodpecker is the largest woodpecker found in most of North America, although the possibly extirpated ivory-billed woodpecker (*Campephilus principalis*) in the southeastern United States and Cuba and the Imperial Woodpecker (*C. imperialis*) of western Mexico are larger. Best recognized by its large, dull black body and red crest, the pileated woodpecker is a permanent resident of deciduous or coniferous forests in southern Canada and in the western, midwestern, and eastern United States (Bull et al 1995). The pileated woodpecker is listed as a State Candidate species in Washington and they are found throughout the forests of Washington with sightings occurring on the Wenas WA. Dead trees provide favored sites in which to excavate nest cavities, and hollow trees are typically used to roost in at night. Only large-diameter trees have enough girth to contain nest and roost cavities of this species, so there is concern for populations of this woodpecker where old-growth forests are being converted to younger stands. Availability of suitable habitat is apparently the factor limiting most populations. A pair defends its territory year-round, and a pair member will not abandon a territory even if its mate is lost.

Because of its size and strong chisel-shaped bill, this woodpecker is particularly adept at excavating, and it uses this ability to construct nest and roost cavities and to find food. Its diet consists primarily of wood-dwelling ants and beetles that are extracted from down woody material and from standing live and dead trees. In its excavating, this species plays a crucial role in many forest ecosystems in North America; a diverse array of other birds—as well as mammals, reptiles, amphibians, and invertebrates—use its cavities for shelter and nesting.(Bull et al. 1995).

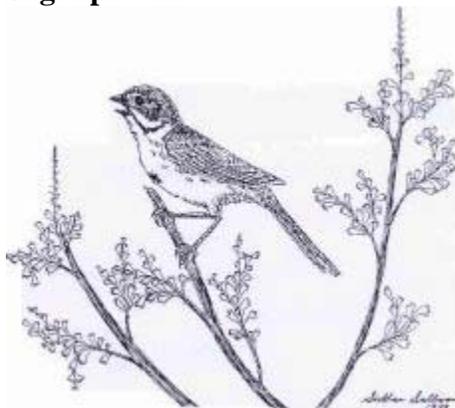
The availability of large snags (standing dead trees) and large decaying live trees used for nesting and roosting by pileated woodpeckers has declined in many areas as a result of forest conversion (e.g. removal of forest for urban development) and timber management practices (Bull and Jackson 1995, Ferguson et al. 2001 in WDFW 2003 PHS, Pileated woodpecker).

The following recommendations are based on research conducted in the Blue Mountains of northeastern Oregon (Bull 1987, Bull and Holthausen 1993) as well as research conducted in northwestern Montana (McClelland and McClelland 1999). Several key habitat components are necessary to maintain suitable pileated woodpecker habitat. These include a mature forest with >2 canopy layers, the uppermost being 25-30 m (82-98 ft) in height; large live trees to provide cover and eventual replacement of dead trees; large dead trees for nesting; and dead trees and downed woody material for foraging (Bull 1987).

Territory size for breeding pairs in the Blue Mountains averaged 407 ha (1,006 ac) and was considered an adequate size to manage for each breeding pair in that region (Bull and Holthausen 1993).

Researchers working in the Blue Mountains recommended that 75% of management areas be in grand fir forest types and they suggested that the composition of this area include 25% old growth and 75% mature stands. Additionally, they suggested that >50% of the management areas have >60% canopy closure and that at least 40% of the stands remain unlogged (Bull and Holthausen 1993). Bull and Holthausen (1993) recommended retaining 8 snags/ha (3.2 snags/ac) with at least 20% being > 51 cm (20 in) dbh for both nesting and roosting. Based on Bull's (1987) research, trees > 28 m (92 ft) should be retained to provide nesting structures. Bull and Holthausen (1993) recommended retaining >100 logs/ha (40/ac) as foraging substrate in management areas, with a preference for logs >38 cm (15 in) dbh that include all species except lodgepole pine (*Pinus contorta* var. *latifolia*). McClelland and McClelland (1999) suggested that the optimum dbh for nest and roost trees should be: 77-91 cm (30-36 in) for western larch, 76-96 cm (30-38 in) for Ponderosa pine, and 75-100 cm (30-39 in) for black cottonwood (*Populus balsamifera*).

Sage sparrow



General breeding range of the sage sparrow, *Amphispiza belli*, in Washington. Map derived from Smith et al. 1997.

The following information was taken from: Washington Department of Fish and Wildlife. 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. by Matthew Vander Haegen. Sage Sparrow *Amphispiza belli*.

The sage sparrow is a State Candidate species that depends almost entirely on sagebrush-steppe habitat (Braun et al. 1976, Rich 1980, Reynolds 1981, Petersen and Best 1985). This habitat in

Washington has become severely fragmented and reduced in extent over the last century (Dobler et al. 1996), particularly the deep-soil communities that this species apparently prefers (Vander Haegen et al. 2000). Furthermore, the Interior Columbia River Basin Ecosystem Management Project listed the sage sparrow as a species of high management concern for the region (Saab and Rich 1997).

Sage sparrows are closely associated with sagebrush-steppe plant communities (Braun et al. 1976, Wiens and Rotenberry 1981). Sagebrush-steppe describes a plant community consisting of one or more layers of grasses and forbs with a discontinuous overstory of sagebrush shrub cover (Daubenmire 1988). Sage sparrows are sensitive to fragmentation of sage cover and are found more frequently in extensive areas of continuous sage (Knick and Rotenberry 1995, Vander Haegen et al. 2000).

Availability of extensive sagebrush-steppe habitat is a primary factor limiting sage sparrow populations (Martin and Carlson 1998, Vander Haegen et al. 2000). Sage sparrows are sensitive to fragmentation of sagebrush stands and are found more frequently in large, undisturbed stands (Vander Haegen et al. 2000). Degradation of sagebrush stands by invasive plants such as cheatgrass (*Bromus tectorum*) also may render sites less suitable to sage sparrows (Dobler et al. 1996).

Sage sparrows are dependent on stands of sagebrush for nest sites, food, and cover (Martin and Carlson 1998). In order to maintain sage sparrow populations, sagebrush communities should be left in relatively undisturbed condition and fragmentation should be avoided. Management activities that increase cheatgrass and other exotic species that increase the risk of wildfire also should be avoided.

Optimum habitat for sage sparrows in Washington consists of large (>1000ha) blocks of sagebrush-steppe with sagebrush cover ranging from 10-25% and shrubs averaging >50 cm in height (Altman and Holmes 2000). Herbaceous cover of native species should average >10%, with >10% of the ground remaining bare (including areas of cryptogamic crust) to allow movement on the ground. Exotic annual grasses should cover <10% of the ground. Although much of Washington's sagebrush-steppe is fragmented by agriculture, habitat restoration on formerly tilled fields could expand the range of sagebrush-steppe obligate birds in fragmented landscapes (Vander Haegen et al. 2000).

Removal of sagebrush should be avoided, with the exception of rare instances when reducing shrub cover is necessary to meet ecological goals of habitat restoration (Wisdom et al. 2000). Sagebrush cover should be reduced on a site only after careful consideration of how the methods used may affect sagebrush regeneration and the opportunity for exotic vegetation to invade the site.

Burning may lead to serious negative impacts to local sage sparrow populations because the damage is immediate and regeneration to pre-burn condition may take up to 30 years (Harniss and Murray 1973). Fire is not a suitable tool to reduce sagebrush cover in low rainfall zones (e.g. Benton, Franklin, and Grant Counties) where exotic vegetation often becomes dominant and sagebrush is slow to recover (Knick and Rotenberry 1995, Wisdom et al. 2000).

Although limited data are available on this subject, livestock grazing at low to moderate levels has not been shown to be detrimental to sage sparrow habitat (Saab et al. 1995). Because sage sparrows in Washington frequently nest on the ground early in the spring (Washington Department of Fish and Wildlife, unpublished data), and because they primarily forage at ground level, grazing should be kept at low levels (Altman and Holmes 2000). Researchers suggest allowing >50% of the year's growth of perennial bunchgrass to persist through the following breeding season.

White-headed Woodpecker



Range of the white-headed woodpecker, *Picoides albolarvatus*, in Washington. Map derived from the literature

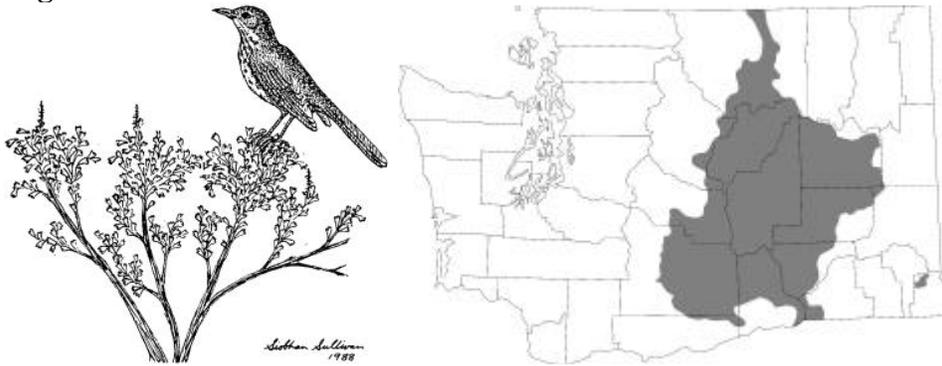
The white-headed woodpecker is a year round resident of lower elevation Ponderosa pine forests (generally below 950m). These woodpeckers are particularly vulnerable to population decline due to their highly specialized winter diet of Ponderosa pine seeds. Nesting and foraging requirements are two critical habitat attributes limiting the population growth of this species. Both factors are closely linked to the habitat attributes of mature open stands of Ponderosa pine. Past land use practices, including logging and fire suppression, have resulted in significant changes to the forest structure within the Ponderosa pine ecosystem (Ashley and Stovall 2004). The highest abundance of white-headed woodpeckers occurs in old-growth conifer stands, particularly those with a mix of two or more pine species. These birds are uncommon or absent in monospecific Ponderosa pine forests and stands dominated by small-coned or closed-cone conifers, e.g., lodgepole or knobcone pine (Ashley and Stovall 2004).

White-headed woodpeckers live in montane coniferous forests from British Columbia to California and seem to prefer a forest with a relatively open canopy (50-70 percent cover) and an availability of snags (standing dead trees) and stumps for nesting. The birds prefer to build nests in trees with large diameters, and show increasing preference with larger diameter. The understory vegetation is usually very sparse within the preferred habitat and local populations are abundant in burned or cut forest where residual large diameter live and dead trees are present.

White-headed woodpeckers are monogamous and may remain associated with their mate throughout the year. They build their nests in old trees, snags or fallen logs but always in dead wood. Nesting generally occurs in large Ponderosa pine snags with hard outer wood and soft heartwood. In British Columbia 80 percent of reported nests were in Ponderosa pine snags, while only 20 percent were in Douglas-fir snags (Ashley and Stovall 2004).

Buchannon et al collected vegetation data in 1999 at 21 white-headed woodpecker nests distributed along the east slope of the Cascade Mountains in Washington. Several of these were located on the Wenas Wildlife Area. They found 12 nests in 1999. The remaining nine nests had been located in prior years by bird-watchers or biologists. Seventeen of the nests were in the Ponderosa pine vegetation zone defined by Cassidy (1997), and others were found in Interior Douglas-fir or Grand Fir zones. Sixteen of 21 (76%) white-headed woodpecker nests were in Ponderosa pine snags. Nests were also found in grand fir, quaking aspen (*Populus tremuloides*; 2), and Douglas-fir. Seventeen of the nests were in snags and four were in living trees.

Sage thrasher



Breeding range of the sage thrasher, *Oreoscoptes montanus*, in Washington. Map derived from Smith et al. 1997.

The following information was taken from: Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By Matthew Vander Haegen. Sage Thrasher *Oreoscoptes montanus*. Last updated: 2003.

Sage thrashers breed from British Columbia to eastern Montana, south to northern Arizona and west to California. They winter from central California to central Texas, south to southern Baja California into northern Mexico (American Ornithologists' Union 1983).

In Washington, they are found in the Columbia Basin shrub-steppe region. Sage thrashers are documented in Adams, Asotin, Benton, Douglas, Franklin, Grant, Kittitas, Lincoln, Okanogan, Walla Walla and Yakima counties (Smith et al. 1997).

The sage thrasher is a State Candidate species that is highly dependent on healthy shrub-steppe communities comprised of tall, dense sagebrush (*Artemisia* spp.) (Rich 1980, Reynolds 1981, Reynolds and Rich 1978, Petersen and Best 1991). Shrub-steppe in Washington has become severely fragmented and reduced in extent over the last century (Dobler et al. 1996).

Furthermore, the Interior Columbia River Basin Ecosystem Management Project listed the sage thrasher as a species of high management concern for the region (Saab and Rich 1997).

Sage thrashers are closely associated with sagebrush and are considered obligates of sagebrush communities (Braun et al. 1976). In Idaho, sage thrashers used sites that were characterized as having high sagebrush cover within large blocks of shrub-steppe (Knick and Rotenberry 1995). Shrub-steppe describes a plant community consisting of one or more layers of grasses with a discontinuous overstory of shrub cover (Daubenmire 1988). Sage thrashers nest in stands of big sagebrush (*Artemisia tridentata*), placing their nests in or beneath shrubs that are generally 55 to 90 cm (22-36 in) tall (Reynolds and Rich 1978, Rich 1980, Reynolds 1981, Petersen and Best 1991). In Washington, nest shrubs averaged 102 cm tall (n = 122) (Washington Department of Fish and Wildlife, unpublished data). Thrasher nests are bulky and usually located in large bushes with substantially thick branches that provide adequate support.

Reynolds (1981) found that nests built either on the ground or within shrubs had approximately the same depth of foliage over their nests (57.5 cm [23 in]). Petersen and Best (1991) reported that sage thrashers favored shrubs with high foliage density. They also found that thrashers preferred nesting in shrubs having branches or foliage within 30 cm (11.7 in) of the ground. Sage thrashers require a relatively open understory for foraging (Reynolds et al. 1999); however, the amount of bare ground around a typical nest site is usually less than that of the surrounding area (Petersen and Best 1991).

Sage thrashers in Washington occurred in greater abundance in shrub-steppe communities that ranged from fair to good condition (characterized by fewer invasive exotic plants) than at poor condition sites (Vander Haegen et al. 2000). Additionally, sage thrashers were more abundant in shrub-steppe communities with loamy and shallow soils rather than sandy soils.

Sage thrashers will nest in fragments of shrub-steppe set within agricultural areas (Vander Haegen et al. 2002). However, birds using these fragmented sites may experience greater rates of nest predation than their counterparts nesting in large blocks of shrub-steppe.

Sage thrashers forage primarily on the ground and mainly consume grasshoppers, ants, beetles and other insect larvae during the spring (Ryser 1985, Stephens 1985, Petersen and Best 1991). In summer, small fruits are added to their diet (Ryser 1985).

Availability of shrub-steppe communities containing tall sagebrush for nesting likely limit the distribution of sage thrashers in Washington (Reynolds et al. 1999). Additionally, degradation of sagebrush stands by invasive plants such as cheatgrass (*Bromus tectorum*) also render sites less suitable to sage thrashers. Fragmentation of shrub-steppe by agriculture apparently does not exclude sage thrashers but will result in lost breeding habitat (Reynolds et al. 1999).

In order to maintain sage thrasher populations, shrub-steppe communities should be left in reasonably undisturbed condition and fragmentation should be minimized (Reynolds et al. 1999, Wisdom et al. 2000). Management activities that increase cheatgrass invasion or increase risk of wildfire also must be avoided. Optimum habitat for sage thrashers in Washington consists of blocks of shrub-steppe > 16 ha (40 ac) with sagebrush cover ranging between 5-20% and shrubs

averaging >80 cm (32 in) tall (Altman and Holmes 2000). An herbaceous cover of native species should average 5-20%, with 10% of the ground bare (including areas of cryptogamic crust) to allow movement on the ground. Exotic annual grasses should cover <10% of the ground.

Although much of Washington's shrub-steppe is fragmented by agriculture, habitat restoration on formerly tilled fields could expand the range of shrub-steppe obligate birds in fragmented landscapes (Vander Haegen et al. 2000). Removal of sagebrush should be considered only in rare instances when reducing shrub cover is necessary to meet ecological goals of habitat restoration (Wisdom et al. 2000). Sagebrush cover should only be reduced after careful consideration of how the removal methods may affect sagebrush regeneration and the spread of exotic vegetation.

Burning may lead to serious negative impacts to local sage thrasher populations because the damage is immediate and regeneration to pre-burn condition may take up to 30 years (Harniss and Murray 1973). Fire is not a suitable tool to reduce sagebrush cover in low rainfall zones (e.g., Benton, Franklin and Grant Counties) because exotic plants overwhelm the native plants and sagebrush is slow to recover (Knick and Rotenberry 1995, Reynolds et al. 1999, Wisdom et al. 2000).

Although data are limited on this subject, livestock grazing at low to moderate levels has not been shown to be detrimental to sage thrasher habitat (Saab et al. 1995). Because sage thrashers frequently nest and forage at ground level, Altman and Holmes (2000) state that grazing levels should be kept at low intensities. They also suggest allowing >50% of the year's growth of perennial bunchgrass to persist through the following breeding season.

Vaux's Swift



Range of the Vaux's swift, *Chaetura vauxi*, in Washington. Map derived from Washington Department of Fish and Wildlife data files and GAP Analysis of Washington

The following information was taken from: Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By Jeffrey C. Lewis, Morie Whalen, and Ruth L. Milner. Vaux's Swift *Chaetura vauxi*. Last updated: 2002

Vaux's swifts breed from southeastern Alaska, northwestern and southern British Columbia, western Montana, and northern Idaho south to central California and west to the Pacific Coast. They winter from northern Mexico south to Central America and Venezuela (Bull and Collins

1993, DeGraaf and Rappole 1995, Sibley 2000). Vaux's swifts are summer residents throughout wooded areas of Washington (see Figure 1; Hoffman 1927, Jewett et al. 1953, Manuwal and Huff 1987, Lundquist and Mariani 1991). They usually arrive in Washington around early May and remain until September (Hoffman 1927). Breeding populations may occur in forested habitats throughout the state (Kitchin 1949, Jewett et al. 1953, Thomas et al. 1979, Brown 1985).

The Vaux's swift is a State Candidate species associated with old-growth and mature forests in the Cascade Range (Manuwal and Huff 1987, Lundquist and Mariani 1991), Olympic Peninsula (Kitchin 1949), and Blue Mountains (Jewett et al. 1953). Throughout their breeding range they are highly dependent on large hollow trees and snags for nesting and roosting (Baldwin and Zaczkowski 1963, Bull 1991, Bull and Cooper 1991). Loss of old-growth and mature forested habitat in Washington (Harris 1984, Thomas et al. 1990) threaten Vaux's swift populations (Bull 1991, Bull and Hohmann 1993).

Vaux's swifts are strongly associated with old-growth forests (Manuwal and Huff 1987, Gilbert and Allwine 1991, Huff and Raley 1991, Lundquist and Mariani 1991, Manuwal 1991, Bull and Hohmann 1993), nesting primarily in old-growth coniferous forests (Baldwin and Zaczkowski 1963, Bull and Cooper 1991, Bull and Hohmann 1993). However, the characteristics of the stand as a whole (i.e., age, canopy layering, stem density) may not be as critical as the availability of suitable nesting or roosting structures (Bull and Hohmann 1993). The availability of suitable nesting or roosting structures is suspected to be the limiting factor for this species (Bull and Hohmann 1993). They require hollow chambers in large snags or live trees with broken tops for nesting and night roosting. The height where swifts nest in hollow trees or snags may vary, ranging from near base level (Baldwin and Zaczkowski 1963) to an average of 12 m (39 ft) (Bull and Cooper 1991). Bull and Cooper (1991) found that nest trees averaged 25 m (82 ft) in height and 68 cm (27 in) in diameter at breast height (dbh). Many Vaux's swifts nest in hollow trees used by roosting pileated woodpeckers (*Dryocopus pileatus*). Swifts enter these trees through holes excavated by pileated woodpeckers. Without the aid of pileated woodpecker excavation, swifts would have no access to many hollow tree chambers (Bull and Collins 1993). Sterling and Paton (1996) suggested that Vaux's swifts may rely on pileated woodpeckers to create nesting habitat, potentially explaining the similar ranges of these two species in California.

The strong connection of this species to old-growth forests suggest that availability of this type of forested habitat and its associated features (e.g., large, hollow snags and live trees) limit the swift's distribution and abundance during breeding season.

Vaux's swifts are found at their highest densities in old-growth forested habitat (Carey 1989, Carey et al. 1991, Gilbert and Allwine 1991, Huff and Raley 1991, Lundquist and Mariani 1991, Manuwal 1991, Bull and Hohmann 1993). The higher abundance of large, hollow snags and live trees appear to explain the greater density of swifts in old-growth versus younger forested stands (Bull and Collins 1993). Protection of existing old-growth should benefit Vaux's swifts, along with managing forest stands on long rotations (>200 years) and maintaining large hollow snags and live trees (Cline et al. 1980, Bull and Collins 1993, Bull and Blumton 1997). Large snags and live trees intended for future snag replacement should be retained and adequately distributed in harvest units (Bull and Collins 1993) and all hollow snags and live trees should be left intact [preferably >50 cm (20 in) dbh]. Large defective trees, especially those showing signs of decay

such as top rot, broken tops, fungal conks, dead branch stubs, or other defects, should be retained (Cline et al. 1980, Neitro et al. 1985).

Western & Mountain Bluebird

This transitional habitat cavity nester relies on finding snags that provide excavated holes for nesting. Snags are in limited supply due to past timber management practices that eliminated trees that could provide primary excavators a place to forage and subsequently a place for bluebirds to nest. Audubon Society members have been active in providing blue bird nest boxes along major roads adjoining and interior to the Wildlife Area that have enhanced this population. WDFW management is directed toward natural habitat development (providing snags) and snag protection to ensure continued existence.

White-tailed & Black-tailed Hare (Jackrabbit)

These two jackrabbits are listed as a State Candidate species in Washington and hunting is currently not allowed. Declines in historic numbers caused concern throughout eastern Washington. The white-tailed hare is the largest hare, weighing 6-9 pounds and is found in shrub-steppe communities of eastern Washington. The black-tailed hare, weighing 4-6 pounds, is thought to be a relatively recent addition to Washington invading the state from the south around 1870 (WA-PS-154). It is found in areas with less than 10 inches of rainfall within the shrubs-steppe communities. They both feed on almost any green vegetation during the summer, switching to available vegetation, including buds, twigs and bark in the winter. Hares are preyed on by raptors and coyotes and may play a role in raptor population abundance. Both hares occur on the eastern portion of Wenas Wildlife Area but in very low numbers. Maintaining the shrub-steppe community is the key to continued management for these species.

Townsend's Ground Squirrel

Ground squirrels are common throughout the western two thirds of the North American Continent. Most are common to areas of open sagebrush and grasslands and are often found in and around dry land grain fields, meadows, hay land and irrigated pastures (Prevention and Control of Wildlife Damage, Askam, L. 1994). Fossils of Townsend's have been recovered from late Wisconsin-early Holocene localities within the present range in Washington (Rickart, E. A. 1987). These same records probably represent the Washington ground squirrel as well (Rickart, E. A. 1991). The Washington ground squirrel is listed as a State Candidate Species, while the Townsend's ground squirrel is a Species of Concern in Washington. The Washington ground squirrel ranges north of the Columbia River particularly in Franklin, Adams and Grant Counties while the Townsend's ground squirrel range is south of the Columbia River in Benton, Yakima, Kittitas and Klickitat Counties. Ground squirrels are preyed on by badger and in these areas are considered an important food source for ferruginous hawks as well as other avian predators. Badgers excavate ground squirrel holes, which provide for burrowing owl nest sites. Until recently (early 1980's) populations seemed to be stable, however, with the decline of shrub-steppe for agricultural production many species, including these, have come under scrutiny to determine the status of the populations. Current Townsend ground squirrel populations occur on the Mellotte and Sheep Company road areas. Although not in high numbers this may represent the western portion of its range in the Yakima basin.

Burrowing Owl

The burrowing owl (*Athene cunicularia*) is a State Candidate species and a Federal Species of Concern. It is also classified as a migratory bird and is therefore protected under the Migratory Bird Treaty Act. Burrowing owls in North America have suffered population declines and significant range contraction (Dechant et al. 1999). Washington State is one of the areas population declines are thought to have occurred, and as such, a review of its status is in process by WDFW's Wildlife Program. As the bird's name suggests, this small (8-10 inches tall) mottled buff-white and brown owl with long legs and yellow eyes lives in a hole in the ground made by badgers and other burrowing animals. It is active both during the day and at night and its call is a cooing similar to that of a mourning dove.

In eastern Washington, burrowing owls use burrows excavated by mammals (badger, marmots & ground squirrels) in shrub-steppe, abandoned agricultural fields, pastures and along road cut-banks surrounded by bare ground or short grass where other burrows are located. The burrow's nest cavity is located at the end of a 5 to 10 foot tunnel. Habitat conditions surrounding successful nests have more Sandberg's bluegrass and clasping pepperweed, and less rabbitbrush, cheatgrass and other weedy plants in the Pasco to Moses Lake study area (Conway et al. 2002).

Burrowing owls are opportunistic feeders. They consume mostly insects, especially beetles, crickets, and grasshoppers. They also prey on small mammals, birds, and lizards. They eat mostly vertebrates during the spring breeding season and insects later in the summer.

Until about 100 years ago, burrowing owls were common across the plains and prairies of North America, but the advent of agriculture and other human development greatly reduced the bird's range. Plowing and building eliminated habitat for burrowing owls as well as for mammals that made the burrows in which they live. Potential nest burrows are being destroyed each year in eastern Washington and preventing declines depends partly on maintaining available nest burrows (Conway, et al. 1999). Burrowing owls often use the same burrows in successive years and maintenance of these sites is important for the continued sustainability of their population. Protecting the fossorial mammal population should be a priority to prevent future declines in burrowing owls (Conway, et al. 1999).

Burrowing owls are harmed in other ways as well. For example, the application of agricultural pesticides is thought to have harmed mature and young burrowing owls and eliminated the bird's food supply. In addition, owls that stand near roadsides to hunt are more likely to encounter mortality from vehicular collisions.

A small number of burrowing owls use a portion of the Wenas Wildlife Area and efforts to preserve these sites are a topic of discussion. Roads and high public use and adjacent property development all contribute to the concerns of preserving this species over the long-term.

Shrub steppe obligates

More than 100 bird species forage and nest in sagebrush communities, and at least four of them the greater sage grouse, sage thrasher, sage sparrow and Brewer's sparrow are obligates (Braun et al. 1976). In a recent analysis of birds at risk within the interior Columbia Basin, the majority of species identified as of high management concern were shrub steppe species (Vander Haegen et al. 1999). Moreover, over half of these species have experienced long-term population declines according to the Breeding Bird Survey (BBS) (Saab and Rich 1997). Changes in land use over the past century have resulted in the loss of over half of Washington's shrub-steppe habitat. Dramatic increases in dry-land agriculture and use of irrigation to expand farming and orchards has reduced the once expansive native grasslands and shrub-steppe to a fragmented landscape with very few large areas of native vegetation (Dobler, F. et al, 1996). The eastern portion of the Wenas Wildlife Area contains shrub-steppe communities that support these species.



Meadowlark

Mature Forest Obligates

The North Cleman Mountain Unit contains the majority of the forested habitat on the Wenas Wildlife Area, although there are small stands of timber on scattered along Umtanum Ridge. Most of the ownership is checker boarded with DNR. The perpetual timber rights on WDFW ownership are owned by Western Pacific Timber. Historically these forested areas primarily contained Ponderosa pine and Douglas fir that supported species such as the white-headed woodpecker. Currently most of the stands are overstocked and the species composition has shifted towards shade tolerant fir species. If WDFW re-acquires the timber rights, these stands will need to be evaluated and management plans developed to move them toward a more healthy condition, closer to what was found on the sites historically before timber harvest and fire suppression modified the density and species composition.



Male White-headed Woodpecker

Priority Species

Priority species, which are found on the Wildlife Area include: bald eagle which are primarily winter migrants; peregrine falcons have recently returned and forage throughout the Wildlife Area; prairie falcon which nest on cliffs above the Yakima River and Umtanum Creek; Ferruginous Hawk may have nested on the Wildlife Area in the past; northern goshawk are mature forest inhabitants and effected by timber harvest and loggerhead shrike feed on large insects in arid areas. (Information on priority Habitats and Species list are available at <http://wdfw.wa.gov/hab/phsvert.htm#birds>).

Table 2. Listed species that occur, or have the potential to use the wildlife area include:

| | |
|--------------------------|---------|
| Bald Eagle | ST, FSC |
| Burrowing owl | SC, FSC |
| Ferruginous hawk | ST, FSC |
| Flammulated Owl | SC |
| Golden eagle | SC |
| Loggerhead shrike | SC, FSC |
| Northern goshawk | SC, FSC |
| Peregrine falcon | SE, FSC |
| Pileated woodpecker | SC |
| Sage grouse | ST |
| Sage sparrow | SC |
| Sage thrasher | SC |
| Townsend's Big-Eared Bat | SC, FSC |
| Vaux's Swift | SC |
| Western bluebird | SC |

State endangered (SE), State threatened (ST), State candidate for listing (SC), Federal endangered (FE), Federal candidate (FC), Federal species of concern (FSC).

Steelhead Trout

Steelhead trout are known to exist in the Yakima River and are expected to occur in Umtanum Creek up to the falls. Steelhead is listed as Threatened within the Columbia Basin Evolutionarily Significant Unit (ESU). The Wenas Wildlife Area resides within this boundary and basin wide management applies here.

The following information has been excerpted from the Yakima Sub Basin Plan (2004).

Steelhead trout were widely distributed in the Yakima basin prior to Euro-American settlement and were known to utilize virtually all of the major streams and tributaries for some aspect of their life history. It is probable that the historical spawning distribution of summer steelhead included virtually all accessible portions of Yakima Basin, with highest spawning densities occurring in complex, multi-channel reaches of the mainstem Yakima and Naches, and in third and fourth order tributaries with moderate (1-4%) gradients. The historic abundance of steelhead trout is poorly known. Howell et al., (1985) estimated that over 80,000 adult steelhead trout might return to spawn in the Yakima Sub-basin.

The current range of steelhead/rainbow trout in the Yakima Subbasin is slightly smaller than under historic conditions. Fewer tributaries are utilized for spawning and rearing than were historically. Relevant examples include Tieton River and Wenas Creek. Sections of many streams thought to formerly support spawning and rearing are now utilized only as migration corridors due to habitat degradation. When compared to other rivers with similar elevation the proportion of the steelhead/rainbow trout population that exhibits anadromy is significantly reduced. There are several theories that attempt to reconcile this difference in rates of anadromy – current environmental conditions favor residency; interbreeding with introduced resident rainbow; loss of anadromy due to reduced access caused by early operations of Roza Dam. It is also known that growth of juvenile rainbow trout is well below rates in similar Columbia Basin

systems, reinforcing the hypothesis that the young of the year life stage is limiting rainbow/steelhead trout production in Upper Yakima.

Yakima Subbasin steelhead typically spend between one to three years in the ocean before returning to natal streams to spawn. Analysis of scales collected from fish captured at Prosser Dam revealed that 52% of steelhead trout spent one year in the ocean, 44% spent two years, and 3% spent three years (Yakima Subbasin Fish and Wildlife Planning Board 2004).

Key findings for steelhead:

- Steelhead populations have been dramatically reduced from pre-settlement abundance levels.
- Survival of steelhead kelts (mature spawned out fish with the potential to spawn again) migrating out of the Yakima Basin and through the main stem Columbia to the ocean is at or near zero.
- Capture, rehabilitation, and release of these fish in the Yakima Basin increases survival and could act as a source of broodstock/genetic material for reintroduction efforts.
- Satus and Toppenish steelhead populations are healthy.
- Production of steelhead within the Yakima Basin is heavily weighted towards Satus and Toppenish Creeks, increasing population levels in other creeks within this assessment unit (AU) and in other AU's will decrease risk of extinction of steelhead in the Yakima Subbasin.
- Existing and forecast future levels of abundance and straying indicate that natural colonization of suitable habitats (after removal of obstructions to passage) would be very slow or non-existent in this Assessment Unit. Supplementation into newly re-opened habitats could accelerate/greatly improve the success rate of population reestablishment.
- Growth of juvenile resident redband trout is well below rates in similar Columbia Basin systems. Reinforcing the hypothesis that the young of the year life stage is limiting rainbow/steelhead trout production in Upper Yakima.
- Anadromous in rainbow trout populations in the Upper Yakima River are presently much decreased from historic levels.

2.12 Cultural Resources

Cultural, geological, and other non-renewable resources are protected, and may not be removed unless such removal is beneficial to wildlife, habitat, or the Wildlife Area, or for scientific or educational purposes. WDFW will coordinate with the appropriate agency of jurisdiction for the protection of such resources. Past issues have included the removal of various rock formations, Native American artifacts, petrified wood, plants, seeds, and other items by members of the public.

CHAPTER III. MANAGEMENT OBJECTIVES, ISSUES & STRATEGIES

Statewide goals and objectives listed in Chapter One shape management priorities on Wildlife Areas. Specific wildlife area information including why the area was purchased, habitat conditions, species present, and public issues and concerns are evaluated to identify wildlife area activities or strategies. *Public issues from past planning efforts and the Citizens Advisory Group are noted in italics and are captured in Appendix A.*

Objectives and associated strategies or tasks specific to the Wenas Wildlife Area are listed where appropriate under applicable agency objectives. Unfunded needs are underlined.

Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats

1. Maintain big game populations

The Wenas Wildlife Area was purchased to provide and protect critical winter range for deer and elk, as well as perpetuate and improve upland game bird habitat. Wenas is within the range of the Yakima elk herd and provides spring and fall transition range as well as winter habitat for elk and deer populations. The wildlife area also provide year-around habitat for the Umtanum bighorn sheep herd. It is necessary to provide supplemental feed for a portion of the elk that winter on the wildlife area. Beginning in 1970's, an elk fence was constructed that runs up both sides of the Wenas valley, excluding elk from migrating onto the private agricultural lands that line the valley bottom. When elk reach the upper end of the fence, they must head to the south, along the north face of Cleman Mountain, or head to the north, along the south face of Umtanum Ridge. Umtanum Ridge leads them to the winter range in the Cottonwoods, where they are able to winter naturally. The other half that move to Cleman Mountain, are fed at the Mellotte feed site since their winter range is no longer accessible. The increasing human development onto traditional winter range had resulted in problems with elk damage to crops, hay piles, fence, and other agricultural-related structures and production. The elk fence also serves as a means of holding the elk herd in the vicinity of the winter feed sites during the winter, and limiting the stress placed on the animals by interaction with humans during a critical time of year. The combination of fencing and winter-feeding has become the necessary solution to controlling elk depredation. Future plans are to evaluate the feasibility of providing access from the Mellotte feed site to the Umtanum Ridge side of the valley, enabling the animals to reach winter range. The Game Management Plan calls to maintain the Yakima elk herd at current levels and increasing bighorn sheep populations to herd objective levels in the Umtanum sheep herd.

A. Strategy: Maintain the Mellotte feed site to provide supplemental winter-feeding for the Yakima elk herd. *Justification:* Prevent elk from moving into agricultural lands. *Timeframe:* Ongoing.

B. Strategy: Maintain the 46.5 miles of elk fence along the boundary of the Wenas Wildlife Area to help minimize elk damage to Wenas valley private properties and minimize trespass livestock grazing. *Justification:* Same as above. *Timeframe:* Year-around.

C. Strategy: Maintain the winter closure to public access (from start of winter feeding to May 1) on the Cleman Mountain portion of the Wenas Wildlife Area (Mellotte feed site). *Justification:* Prevent harassment causing elk energy loss and agricultural land damage. *Timeframe:* Winter.

D. Strategy: Evaluate spring time use by the public on the winter range portion of the wildlife area. *Justification:* To determine if public access needs to be limited during the spring to protect big game from harassment during this critical period and protect roads from unnecessary damage. *Timeframe:* Ongoing.

E. Strategy: Conduct weed control and seed degraded portions of the feed sites with native grasses. *Justification:* Legally required and restore native plants. *Timeframe:* Annually for weed control; as needed and as funding allows for seeding.

F. Strategy: Evaluate the feasibility of providing access from the vicinity of the Mellotte feed site to the Umtanum Ridge side of the valley. *Justification:* Would enable the elk to reach traditional winter range, reducing the need for supplemental feeding. *Timeframe:* Ongoing.

2. Improve and maintain fish populations

Steelhead, spring Chinook, and rainbow, cutthroat and bull trout are all considered important culturally, ecologically and economically to the sub-basin. These species are present (or were historically present) year-round throughout the watershed in one life stage or another. It is assumed that other aquatic life will benefit from managing toward suitable conditions for these species, due to their wide range of habitat requisites (DASP 2004). The most common limiting factors for both summer steelhead and spring Chinook are stream flow and water temperature, habitat diversity, sediment load, and quantity of key habitats for various life stages. Wenas, Umtanum, and Roza Creeks and their tributaries historically were home to these species. Currently only Umtanum Creek is accessible to steelhead.

Due to the Wenas Dam and lack of water and habitat in the lower portion of Wenas Creek, the upper portion of Wenas Creek and its tributaries are not accessible to anadromous species, but do support resident trout populations. Umtanum and Roza Creeks also support resident trout populations, as well as numerous smaller streams, along with a multitude of perennial and seasonal streams that do not support fish, but do influence downstream water quality and quantity.

A. Strategy: Assess fish species composition and abundance on all streams of the Wenas Wildlife Area. *Justification:* Needed to plan habitat improvement projects and measure success. *Timeframe:* As funds become available.

B. Strategy: Continue Road Maintenance and Abandonment Planning (RMAP) work in the Cleman Mountain and Upper Wenas areas to address sediment delivery, fish passage and other issues related to roads and fish, particularly in the case of stream adjacent roads. *Justification:* Stream adjacent roads deliver

sediment to streams, limit riparian habitat, and may block fish passage, which are detrimental to fish. State law requires RMAP work. *Timeframe:* 2007-2010.

C. Strategy: Correct known passage barriers/sedimentation issues on wildlife area creeks. *Justification:* Passage barriers prevent re-colonization by anadromous and resident fish. *Timeframe:* Begins 2009.

D. Strategy: Review roads on the Wenas Wildlife Area for potential to deliver sediment and other issues relating to roads and fish. Develop a plan for addressing these issues. *Justification:* Sets priorities on road management while alleviating sediment that is detrimental to fish. *Timeframe:* Begins in 2009.

E. Strategy: Restore riparian habitat with shrub and tree plantings along Hanson Pond, OK Corral and other identified creeks. *Justification:* Quality riparian habitat reduces sediment in streams, shades water and reduces temperatures. *Timeframe:* November 2006- January 2007.

3. Manage for upland birds

The Wenas Wildlife Area units were purchased to protect critical winter range for big game, as well as to perpetuate and improve upland game bird habitat. The majority of the Wenas Wildlife Area is currently funded by BPA in part to provide habitat for sage grouse (identified as a focal species) and other shrub-steppe dependent species. The Wenas Wildlife Area is within the recovery area of the sage grouse and will be managed to provide habitat for this state-Threatened species. Natural production of other upland birds on the wildlife area is expected to continue to provide significant recreational opportunities.

A. Strategy: Maintain springs to provide water for upland birds and other species. *Justification:* Available water influences distribution of upland birds and other wildlife. *Timeframe:* Ongoing.

B. Strategy: Field review all springs on the wildlife area and develop maintenance or restoration plans. *Justification:* Available water influences distribution of upland birds and other wildlife. Also allows systematic method and tracking of maintenance needs. *Timeframe:* Year-around.

C. Strategy: Survey wildlife area for sage grouse. *Justification:* Determine status of sage grouse on the wildlife area. *Timeframe:* Annually-March 1- May 15.

D. Strategy: Assess Wildlife Area management practices to ensure that grouse habitat is protected and enhanced when possible. See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats, Sub-objective 6 (Protect and restore shrub steppe habitat) and Sub-objective 7 (Protect and restore forest habitats). *Justification:* Anticipated rejuvenation of sage grouse populations, and protection of existing population of forest and ruffed grouse. *Timeframe:* Annually.

E. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats, Sub-objective 6 (Protect and restore shrub steppe habitat).

F. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats, Sub-objective 7, for forest grouse species (Protect and restore forest habitats).

4. Manage for species diversity

Develop and maintain quality habitat that will provide life requisites for a diversity of species. Nearly all activities on the wildlife area benefit a diversity of species.

A. Strategy: Determine species use by performing surveys for breeding birds, amphibians, or explain what general rules will apply so as not to indirectly create threats to intrinsic species. *Justification:* Prevents inadvertent detrimental impacts to species residing on the project. *Timeframe:* Beginning in 2010 dependant on funding availability.

B. Strategy: Determine species use and need by conducting and/or facilitating surveys of various bird, reptile, amphibian and mammal species. Cooperate with agencies and birding groups to acquire information on wildlife use of the area. *Justification:* Increase knowledge of species on the wildlife area thereby reducing risk of inadvertent negative impacts to wildlife. *Timeframe:* When coordinated with Wildlife Program.

C. Strategy: Evaluate the pheasant release program in Cottonwood Creek to determine human safety concerns. *Justification:* The small area and large crowds combined with other recreation activities appears to present concerns. *Timeframe:* By June 30, 2007 (completed in 2008).

D. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats, Strategy 7.B (Understory thinning and burning assessment). *Justification:* Healthy, diverse forests support wildlife species diversity.

5. Protect and restore riparian habitat

The agency has identified riparian habitat management and protection as a priority. BPA funding of the wildlife area is to provide and enhance riparian habitats for focal species as partial mitigation for the habitat losses associated with the construction and inundation of the Grand Coulee, McNary and John Day hydroelectric dams. Riparian areas provide habitat for a large diversity of fish and wildlife species, for high densities of animals, for important breeding areas and movement corridors.

A. Strategy: Evaluate riparian areas for enhancement needs. *Justification:* Pro-active riparian protection. *Timeframe:* 2010.

B. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats, Strategy 3.B (Water Spring Review). *Justification:* Tracking status of springs.

C. Strategy: Exceed Forest Practices regulations regarding riparian buffer requirements for any timber thinning/habitat improvement treatments that may occur on WDFW-owned timber on the Wenas Wildlife Area. *Justification:*

Reduce sediment delivery to creeks and protect riparian zones (allows case-by-case habitat protection). *Timeframe:* Implement as projects occur.

D. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats, Sub-objective 2 (Improve and maintain fish habitat). *Justification:* Pro-active riparian protection.

6. Protect and restore shrub-steppe habitat

The agency has identified shrub-steppe habitat management and protection as a priority. BPA funding of the wildlife area is to provide and enhance shrub-steppe habitats for focal species as partial mitigation for the habitat losses associated with the construction and inundation of the Grand Coulee, McNary and John Day hydroelectric dams. Shrub-steppe areas provide habitat for a diversity of fish and wildlife species and for comparatively high densities of animals. Shrub-steppe is also very vulnerable to habitat conversion and alteration practices.

A. Strategy: Perform shrub-steppe condition surveys to assess habitat quality issues. *Justification:* Data is needed to monitor changes and trends, identify degraded areas and measure success of improvement activities. Also helps determine wildlife species use for each habitat type. *Timeframe:* As funding is available.

B. Strategy: Evaluate use of prescribed fire to rejuvenate and improve shrub-steppe habitat and reduce the risk of catastrophic fires. *Justification:* History of fire suppression may have negatively altered habitat conditions. Before fire is used current data and research should be considered. *Timeframe:* As funding is available.

C. Strategy: Assess non-native grass stands for restoration to native grasses and forbs. *Justification:* To bring restoration to completion while increasing plant diversity and quality of habitat. *Timeframe:* Spring/Summer 2007.

D. Strategy: Continue to implement weed control through native grass seeding. *Justification:* Established healthy native plant communities can prevent weed invasion. *Timeframe:* Annually-Fall.

E. Strategy: Continue restoration efforts at Sheep Company, Cottonwoods, Roza Creek, and McCade. Weed control and inter-seeding with additional native grass species is anticipated to be necessary, as well as beginning to add forbs into the stands. It may also be necessary to re-start restoration on a portion of the Cottonwood fields and McCade cereal rye fields where past efforts have failed. *Justification:* Restore native plant communities that support native wildlife. *Timeframe:* Annually- Late Spring/Fall

F. Strategy: Continue restoration efforts at Mtn. Vale Ranch where alfalfa hay fields were taken out of production and seeded back to native shrub-steppe. Additional weed control and re-starting restoration efforts on portions of the fields are necessary for successful restoration. *Justification:* Restore native plant communities that support native wildlife. *Timeframe:* Fall 2008.

7. Protect and restore forest habitats

The agency has prioritized mature forest habitat management and protection. Mature forests support high wildlife populations and species diversity, and are important as wildlife breeding and seasonal use habitats. Many forest stands on the Wildlife Area are unhealthy due to overstocking, over-harvest, insects and diseases. Restoration is needed to move these stands towards a more mature, diverse, healthy condition.

A. Strategy: Acquire the perpetual timber rights (PTRs) on the Cleman Mtn. unit.
Justification: Acquisition of timber rights will enable agency to better manage habitat for fish and wildlife species. *Timeframe:* 2006-2008.

B. Strategy: Assess need for understory thinning and prescribed burns in the Dry Creek and North Wenas watersheds to reduce risk of catastrophic fire, insect and disease potential, and create forest conditions that more closely replicate the historic range of variability (HRV) suitable for a diversity of historic wildlife species. *Justification:* If needed, thinning would reduce fuel load and stimulate fire dependant forage species preferred by ungulates and other early successional wildlife species as well as enhancing the growth of the remaining timber, providing future habitat for large diameter pine dependant wildlife species. The Cleman Mtn. unit will need to be assessed if perpetual timber rights (PTRs) are acquired. *Timeframe:* 2008-10.

8. Protect and manage other species

Develop and maintain quality habitat that will provide life requisites for a diversity of species. Nearly all activities on the wildlife area benefit a diversity of species.

A. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats, Sub-objective 2 (Improve and maintain fish habitat).
Justification: Improves habitat conditions necessary for fish species.

B. Strategy: Maintain high quality shrub-steppe, forest, and riparian habitat conditions to enhance obligate species protection. *Justification:* Supports high wildlife species diversity and reduces weed intrusions. *Timeframe:* Ongoing.

C. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats, Sub-objective 6 (Enhance and restore degraded shrub-steppe). *Justification:* Supports high wildlife species diversity and reduces weed intrusions.

D. Strategy: Protect and preserve sensitive wildlife sites such as active sage grouse lek sites, active golden eagle and prairie falcon nests, big horn sheep lambing areas and big game wintering areas from human disturbance. Protection may include implementing area closures to public access during critical periods. *Justification:* Human intrusion by any means, including foot, bicycle, horse or motorized, increases stress and reduces survival of sensitive wildlife. *Timeframe:* Ongoing.

E. Strategy: Protect nesting and foraging habitat for woodpecker species. Protect snags and wildlife trees. Many cavity nesting forest birds depend on the primary cavity excavators to provide nesting and roosting cavities. Species such as the

white-headed woodpecker require large diameter snags and trees for foraging and nesting. *Justification:* Snags and large diameter trees have been eliminated from many forest stands during logging operations and are becoming scarce. *Timeframe:* Ongoing.

F. Strategy: Protect and create snags in association with any timber thinning projects. *Justification:* Limited number of snags, suitable nest sites. *Timeframe:* Implement as projects occur.

G. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats, Strategy 7. B (Forest Habitats). Understory thinning and prescribed burning of overstocked stands will reduce competition and release remaining trees (primarily ponderosa pine), setting stands on a trajectory to produce large diameter ponderosa pine habitat. *Justification:* Reduces disease and fuels allowing for healthier forest stands with larger diameter trees, lower density stands, and greater wildlife use.

H. Strategy: Remove un-needed exterior stock fence. *Justification:* Reduce the potential for entanglement by wildlife. *Timeframe:* Year-around.

I. Strategy: Maintain and expand nest box placement on all units. *Justification:* Limited cavity nest sites for passerine cavity nesters. *Timeframe:* Maintain Annually; Expand as funding allows.

Agency Objective: Provide Sustainable Fish and Wildlife-Related Recreational and Commercial Opportunities Compatible With Maintaining Healthy Fish and Wildlife Populations and Habitats. Improve the Economic Well-Being of Washington by Providing Diverse, High Quality Recreational and Commercial Opportunities.

1. Provide public access compatible with fish, wildlife and habitat protection

Access for hunting, fishing, wildlife viewing and other activities is an agency priority. However, access and recreation must be controlled to protect fish and wildlife resources and to comply with federal and state regulations. *Public input clearly emphasizes the importance of providing recreational access with protections for the resource.*

A. Strategy: Use the Cooperative Green Dot Road Management System to provide open roads on WDFW ownership where no resource issues exist and when there are sufficient resources to maintain them. Address requirements in Road Management and Abandonment Plans. *Justification:* Provides public access and provides management consistency. *Timeframe:* Ongoing.

B. Strategy: Close road access, either seasonally or permanently, where road conditions are not safe or where conditions have a significant negative impact on fish and wildlife. Hardy Canyon road is scheduled for abandonment in 2008 (to meet RMAP requirements), once an alternate green dot road is in place. *Justification:* Increase safety and reduce habitat and species impacts. *Timeframe:* Hardy Canyon 2008. Remainder as funding is available.

C. Strategy: Continue to implement the Wenas Road Management and Abandonment Plan as required by Forest Practices regulations. *Justification:* Legally mandated and provides resource protection. *Timeframe:* Implement as projects occur.

D. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats, Sub-objective 8 (protect sensitive wildlife sites). *Justification:* Disturbance detrimental to sensitive species.

E. Strategy: Provide limited, primitive camping where no resource issues exist. Dispersed camping is allowed while vehicle camping is only allowed within 100 feet of open, green dot roads unless otherwise posted. Camping is limited to 14 days within a 60 day period on all WDFW owned or managed lands within Yakima and Kittitas Counties. Limit is extended to 30 days in a 60-day period from September 1 through November 30. No permanent camps or structures are allowed. Woodcutting is not allowed on WDFW ownership. *Justification:* Legally mandated and provides resource protection. Public users are liable at all times for their campfires. *Timeframe:* Year-around.

F. Strategy: Provide hunting opportunities for persons with disabilities where possible. *Justification:* Provide reasonable access to increase opportunities for the disabled. *Timeframe:* Ongoing.

G. Strategy: Develop GIS layers of all resources, roads, trails, parking and camping areas, and other facilities available to the public. *Justification:* Improves management efficiency and aids the public. *Timeframe:* As staff time is available.

H. Strategy: Develop a GIS-based Green Dot Road Management map for distribution to the public. *Justification:* Improves management efficiency and aids the public. *Timeframe:* 2007.

I. Strategy: Assess the impacts of target shooting on the wildlife area to fish and wildlife and their habitat. *Justification:* To evaluate whether or not there is a need for more control of target shooting and the litter and damage associated with it. *Timeframe:* As funding is available.

Agency Objective: Minimize Adverse Interactions between Humans and Wildlife.

1. Provide refuge areas for wildlife and reduce winter disturbance

Human activity on the wildlife area can displace wildlife populations. If this activity is determined to be detrimental, areas are posted to limit public entry. Winter disturbance is especially critical because of the higher energy requirements needed by wildlife during severe weather.

A. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats, Strategies 1.C & 1.D (winter closures and monitor public use). *Justification:* Reduce body energy loss to wildlife.

2. Implement strategies to reduce elk damage on private lands

The Agency owns, maintains and manages a large land base to provide habitat requisites for wildlife populations. Additional strategies such as supplemental elk feeding, fencing, and herding are implemented to reduce elk damage to crops on adjacent private lands.

The Wenas Wildlife Area has high concentration of big game on winter range that must forage on early spring grasses to replenish their energy levels. Human disturbance can move these animals off the Wildlife Area and onto private lands, causing damage to crops and range pastures.

A. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats, Strategies 1.C & 1.D (winter closures and monitor public use). *Justification:* Reduce disturbance and energy loss to wildlife on public lands.

B. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats, Sub-objectives 6 (Protect and restore shrub-steppe habitat) and 7 (Protect and restore forest habitats). *Justification:* Improve habitat on public lands.

C. Strategy: See Agency Objective: Provide Sustainable Fish and Wildlife-Related Recreational and Commercial Opportunities Compatible With Maintaining Healthy Fish and Wildlife Populations and Habitats. Improve the Economic Well-Being of Washington by Providing Diverse, High Quality Recreational and Commercial Opportunities, Sub-objective 1 (Provide public access compatible with fish, wildlife and habitat protection). *Justification:* Reduce wildlife disturbance on public lands.

Agency Objective: Ensure WDFW Activities, Programs, Facilities and Lands are Consistent with Local, State and Federal Regulations that Protect and Recover Fish, Wildlife and Their Habitats

1. Manage weeds consistent with state and county rules and to protect and recover fish and wildlife and their habitats

Weed control is required by state law to protect public economic and natural resources. Invasive weeds are one of the greatest threats to fish and wildlife habitat quality. Cooperative weed efforts are encouraged to improve efficacy and to minimize impacts on adjacent landowners as part of the agencies good-neighbor priority.

A. Strategy: Produce and implement weed management plan (**Appendix 2**) to include weed identification and inventory, risk/threat, control priorities, and monitoring. *Justification:* Increase weed control efficiency. *Timeframe:* Ongoing.

B. Strategy: Coordinate weed efforts with federal, state and local entities. *Justification:* Improve efficacy and minimize costs. *Timeframe:* Annually.

C. Strategy: Continue to use Integrated Pest Management strategies, including biological control, chemicals, mechanical and cultural methods, to control invasive weeds. *Justification:* More effective and environmentally responsible weed control. *Timeframe:* Ongoing.

D. Strategy: Continue to control weeds along all roads on the wildlife area: 50 to 90 miles of roads per year are expected to be treated to reduce the spread of noxious weeds. *Justification:* Roads are in a chronically disturbed state making them more susceptible to weed invasion; also vehicles transport weeds. *Timeframe:* Ongoing-Spring/Fall.

E. Strategy: Continue to electronically map weed locations. Invest in new data collectors and software to improve the efficiency of the wildlife areas noxious weed control program. *Justification:* Improve noxious weed control efficiency, and reduce soil and habitat disturbance. Make data collection, record keeping, reporting, and monitoring all easier, as well as improving the interface capabilities (database to GIS) for map production. *Timeframe:* Annually, as funding allows.

F. Strategy: Complete a comprehensive inventory of the wildlife areas for invasive noxious weeds. *Justification:* Due to the large size of the wildlife area, a complete field review of the acreage has never occurred. Knowing the location of all existing invasive weeds will allow us to catch infestations while they are small, reducing habitat disturbance and improving weed control efficiency. This would allow for dovetailing into a larger mapping effort in the future by adjacent landowners as well. *Timeframe:* As funding and staffing is available.

2. Manage species and habitat in compliance with the Endangered Species Act and Washington State fish passage, road management and forest practice rules.

Federal law requires the protection and management of threatened and endangered species. State law requires fish passage and screening issues and forest road sedimentation issues to be addressed on state lands. Forest thinning operations on agency lands must follow state forest practice law.

A. Strategy: Protect buffers adjacent to wetlands and riparian habitat. *Justification:* Wetlands and riparian zones support unique, priority habitats and species. This reduces sedimentation & keeps water cooler. *Timeframe:* Ongoing.

B. Strategy: List specific strategies associated with ESA species present or potential. *Justification:* Reduce inadvertent negative impacts to ESA species while increasing management efficiency. *Timeframe:* As funding is available.

C. Strategy: See Agency Objective: Provide Sustainable Fish and Wildlife-Related Recreational and Commercial Opportunities Compatible with Maintaining Healthy Fish and Wildlife Populations and Habitats. Improve the Economic Well-Being of Washington by Providing Diverse, High Quality Recreational and Commercial Opportunities, Sub-objective 1 (Provide public access compatible with fish, wildlife and habitat protection). Implement RMAP. *Justification:* Legally required and provides sedimentation control.

D. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats, Sub-objective 2 (protect and maintain fish habitat). Provide fish passage and address sedimentation. *Justification:* Legally required.

E. Strategy: Map all ESA species and their habitats on the wildlife area and develop GIS layers depicting the location and species. *Justification:* Increases

management efficiency and effectiveness of ESA species. *Timeframe:* As staff time and funding is available.

F. Strategy: List specific management practices associated with ESA species present or likely present. *Justification:* Reduce inadvertent negative impacts to ESA species while increasing management efficiency. *Timeframe:* As staff time and funding is available.

3. Provide fire management on agency lands (Appendix 3)

Fire suppression agreements must exist for all agency lands to protect the people of Washington and to protect natural and economic resources of the agency and adjacent landowners.

A. Strategy: Contract with local, state or federal entities to provide fire suppression support. A portion of the Wenas Wildlife Area is within the State Fire Protection Boundary and suppression on these lands is performed by DNR. The remainder is contracted with DNR and/or covered under local fire districts. *Justification:* DNR & USFS have firefighting equipment and personnel to control catastrophic unplanned wildfires. *Timeframe:* Annually.

B. Strategy: Provide red card fire training for wildlife area manager and assistant manager. Provide blue card fire training for remaining staff. *Justification:* Increases safety of staff. *Timeframe:* Annually.

C. Strategy: Coordinate with fire-fighting entities. Maintain list of fire responsible individuals. *Justification:* Improves efficiency of response. *Timeframe:* Annually.

D. Strategy: Provide an on-site liaison to fire-fighting entities when a wildfire occurs on the wildlife area. *Justification:* Improves efficiency of response, provides guidance on Agency priorities. *Timeframe:* Seasonally.

4. Protect cultural resources consistent with state and federal law

Federal and state law requires an assessment of cultural resources on agency lands prior to activities that may impact those resources.

A. Strategy: Assess cultural resource value (historic and archaeological) of all structures before renovation or removal. *Justification:* Prevents inadvertent loss of culturally important structures. *Timeframe:* Implement as projects occur.

B. Strategy: Perform cultural resource survey and assessment before excavation or soil disturbance - including posts for new fence line, parking lots, toilets, buildings, new agricultural fields, seeding, timber management, etc. *Justification:* Required by State and/or Federal law. *Timeframe:* Implement as projects occur.

5. Pay county PILT (Payment in lieu of taxes) and assessment obligations

State law requires the agency to pay PILT and county assessments.

A. Strategy: Pay PILT and assessments to counties. *Justification:* State law requires the agency to pay PILT and county assessments. *Timeframe:* Annually-April 15th.

6. Pay grazing leases on DNR land within the BPA-funded portion of the wildlife area

A. Strategy: Pay grazing leases on DNR land within the BPA-funded portion of the wildlife area. *Justification:* Protects habitat and enhances management capabilities; provides habitat credits to BPA. *Timeframe:* Annually August 1st.

Agency Objective: Reconnect with those Interested in Washington’s Fish and Wildlife

The knowledge and experience of visitors to the wildlife area could be enhanced regarding fish and wildlife habitat management by providing onsite interpretive signs explaining management activities and public use.

Educate the public regarding public access and other regulations through green dot reader boards, other signage, and news releases. Issues include road management system, camping, fires, firewood cutting, permanent structures, mineral extraction, etc.

1. Participate in local cooperative groups

Participating in local groups ensures that issues on or adjacent to the wildlife areas are being identified and addressed in a cooperative manner involving the public, our users, and our neighbors.

A. Strategy: Continue to participate in the Big Game Management Roundtable (BGMR). *Justification:* Maintains communication and coordination with public and landowners. *Timeframe:* Ongoing.

B. Strategy: Attend and participate in Coordinated Resource Management (CRM) meetings that involve issues that could impact management on the Wenas Wildlife Area. *Justification:* Increases management efficiency and coordination between entities involved. *Timeframe:* participate when CRM becomes active on Wenas WA.

2. Involve the public in projects on the wildlife area

Volunteers provide a valuable source of labor and knowledge for various projects on the wildlife area. Minimal staffing limits what the Agency staff can accomplish.

A. Strategy: Provide, as available, projects for Advanced Hunter Education (AHE) participants to complete their community service requirement. *Justification:* Assist in hunter education while accomplishing needed tasks. *Timeframe:* Ongoing.

B. Strategy: Coordinate with local user groups on wildlife area clean-up projects. *Justification:* Assistance for wildlife area staff in accomplishing desired projects and increasing public awareness. *Timeframe:* Annually-April.

C. Strategy: Solicit help from local conservation groups and clubs on habitat enhancement projects. *Justification:* Same as above. *Timeframe:* Ongoing.

Agency Objective: Provide Sound Operational Management of WDFW Lands, Facilities and Access Sites

1. Maintain facilities to achieve safe, efficient and effective management of the wildlife area

A. Strategy: Maintain office, shop, storage structures, residence and other physical improvements to provide a safe and effective workplace. Provide utilities, phone, computers, etc. *Justification:* Efficient operation of the wildlife area requires maintenance of a functional headquarters. *Timeframe:* Ongoing.

B. Strategy: Maintain all fences to reduce big game damage issues and to prevent trespass livestock, thereby protecting habitat. Survey entire elk fence in early spring and late fall each year. *Justification:* Excludes trespass livestock and minimizes potential for elk damage on private land. *Timeframe:* Ongoing.

C. Strategy: Maintain new interior smooth wire fence and install additional fence as needed to protect shrub-steppe and restoration projects. *Justification:* Reduces resource damage by the public and protects habitat and restoration efforts. *Timeframe:* Ongoing.

D. Strategy: Assess historic livestock fencing and remove all un-needed fences particularly where they are a hazard and/or barrier for humans and wildlife. *Justification:* Reduces wildlife barriers and entanglements. *Timeframe:* Ongoing.

E. Strategy: Maintain roads and parking areas to prevent resource damage and provide access. Prioritize maintenance needs. Kelley Hollow and the Ridge roads need portions relocated and the remainder maintained, Roza Creek road needs to be maintained to the end of the green dot, the remainder needs to be abandoned. The Durr road is in need of maintenance for the majority of its length. *Justification:* Maintains public access and prevents resource damage. *Timeframe:* Ongoing.

F. Strategy: Maintain all signs and reader boards. Maintain parking areas to prevent resource damage and provide access. *Justification:* Allows management of public use and controls vehicle travel. *Timeframe:* Ongoing.

G. Strategy: Burn weeds and maintain firebreaks along the interface with populated areas. *Justification:* Reduces the risk of uncontrolled fire along the interface with populated areas. *Timeframe:* Ongoing.

H. Strategy: Using the Region Three Facility/Building Inventory Assessment, identify the five highest priority structures that need to be addressed based on safety issues. Work with engineering staff to schedule and complete work. Engineering should include a cultural resource assessment for historic structures. Surplus any materials/structures to generate revenue prior to demolition or removal. *Justification:* Provides a systematic approach to ensure structures are safe to operate in and around. *Timeframe:* As funding and staffing is available.

2. Maintain other structures and physical improvements

A. Strategy: Maintain Mtn. Vale ranch facility. *Justification:* Required for efficient operation of wildlife area. *Timeframe:* Ongoing.

B. Strategy: Maintain all signs, gates, culverts, water structures, wells, irrigation systems. *Justification:* Required for efficient operation of wildlife area. *Timeframe:* Ongoing.

C. Strategy: Replace/install boundary and unit signs as needed. *Justification:* Allows public to identify property. *Timeframe:* Ongoing.

3. Maintain equipment

A. Strategy: Service all equipment including trucks, tractor and implements, weed sprayers, trailers, etc. Request replacement equipment when needed. *Justification:* Increases service life of equipment reduces down time. *Timeframe:* Ongoing.

B. Strategy: Rent equipment when it is more efficient to do so or when needed. *Justification:* More cost effective. *Timeframe:* Ongoing.

4. Pursue funding opportunities

A. Strategy: Maintain BPA funding. *Justification:* Primary funding source for the Wenas Wildlife Area. *Timeframe:* Ongoing.

B. Strategy: Apply for grants and other funding opportunities consistent with planned priorities to supplement funding. *Justification:* Supplements limited budgets. *Timeframe:* Ongoing.

C. Strategy: Investigate whether wildlife area rangelands would meet the requirements of CRP. Where applicable, enroll lands in CRP and other federal programs to generate revenue and accomplish desired habitat conditions. *Justification:* Improves habitat, reduces erosion, weeds and supplements budgets. *Timeframe:* Spring 2007.

5. Assess forest conditions with regard to catastrophic fire, insect and disease risks

The history of fire suppression in many cases has resulted in forest tree densities far greater than historic levels. Dense forest stands may create fire hazards for humans and wildlife and increase the risk of detrimental forest insects and disease reaching catastrophic levels.

A. Strategy: Assess/implement forest-thinning projects to reduce potential insect and fire danger and create forest conditions more suitable to a diversity of species. See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats, Sub-objective 7 (protect and improve forest habitats). *Justification:* Responsible forest management. *Timeframe:* Ongoing.

6. Perform administrative responsibilities

A. Strategy: Submit annual contract to BPA. *Justification:* Required by BPA for annual funding. *Timeframe:* Annually.

B. Strategy: Develop and monitor budgets. *Justification:* Determines outcomes. *Timeframe:* Annually.

- C. Strategy:* Supervise employees. *Justification:* Legally required. *Timeframe:* Ongoing.
- D. Strategy:* Write reports. *Justification:* Agency required. *Timeframe:* Ongoing.
- E. Strategy:* Coordinate and work with adjacent landowners to develop and share mutual objectives. *Justification:* Provides consistent management. *Timeframe:* Ongoing.
- F. Strategy:* See Agency Objective: Reconnect with those Interested in Washington's Fish and Wildlife, Sub-objective 1 (Participate in local cooperative groups). Attend and participate in CRM meetings. *Justification:* Management actions addressed.
- G. Strategy:* See Agency Objective: Reconnect with those Interested in Washington's Fish and Wildlife, Sub-objective 1 (Participate in local cooperative groups). Attend Big Game Management Roundtable (BGMR) meetings. *Justification:* Enhances communications on resolving issues.
- H. Strategy:* Work with staff to ensure high morale and job satisfaction. Promote self-motivation and good work ethics. *Justification:* General part of supervision. *Timeframe:* Ongoing.
- I. Strategy:* Supervise contractors, lessees, permittees, volunteers, Washington Conservation Corps employees, other WDFW personnel, and public and private organizations on the wildlife area. *Justification:* Ensures compliance of work. *Timeframe:* Ongoing.
- J. Strategy:* Write, update and implement annual BPA-required Statement of Work (SOW), budget, and quarterly and annual reports for the BPA-funded portion of the wildlife area. *Justification:* Required by BPA for annual contract. *Timeframe:* Quarterly/Annually.
- K. Strategy:* Write, update and implement wildlife area management plan, weed control plan and fire control plan. *Justification:* Agency policy and assists in systematic approach to management and control. *Timeframe:* Ongoing.
- L. Strategy:* Conduct wildlife and habitat surveys. Identify and prioritize information and survey needs. *Justification:* Determine status of wildlife and habitat conditions for management options. *Timeframe:* As funding is available.
- M. Strategy:* Manage an extensive equipment inventory used for habitat maintenance, enhancement, restoration and preservation. *Justification:* Ensures successful operation. *Timeframe:* Ongoing.
- N. Strategy:* Plan for and purchase supplies, tools and equipment. *Justification:* Part of administrating the wildlife area. *Timeframe:* Ongoing.
- O. Strategy:* Attend meetings and meet with private individuals and agency representatives as needed. *Justification:* Resolve issues, coordinate activities and act as agent of the agency. *Timeframe:* Ongoing.

P. Strategy: Evaluate performance measures and produce an annual performance report. *Justification:* Monitor success in completing yearly management objectives. *Timeframe:* Ongoing.

Q. Strategy: Meet with Citizens Advisory Group twice per year. *Justification:* Address issues on the wildlife area. *Timeframe:* Biannually.

7. Maintain a knowledgeable and well-trained work force

A. Strategy: Provide red or blue card training for wildlife area staff. *Justification:* Increases safety of staff and required to be on site during fire suppression. *Timeframe:* Annually.

B. Strategy: Send staff with public applicator licenses to recertification workshops. *Justification:* Legally required to maintain public operator pesticide license. *Timeframe:* Annually.

C. Strategy: Provide staff with first aid training. *Justification:* Agency policy. *Timeframe:* Annually.

8. Protect and apply water rights for best use

Water rights can impact wildlife area operations including food plots, restoration projects, etc. Water use can also reduce instream volumes for fish and other animals.

A. Strategy: Identify and record all water rights and uses of water (**Appendix 4**). *Justification:* Determines management options. *Timeframe:* 2005.

B. Strategy: Move all unused water rights permanently or temporarily into the State Trust Water Rights Program. *Justification:* Better use of water resources. *Timeframe:* Ongoing.

CHAPTER IV. PERFORMANCE MEASURES, EVALUATION AND UPDATES TO THE WENAS WILDLIFE AREA PLAN

Wildlife area plan performance measures are listed below for the period of July 1 through June 30. BPA funding follows the federal fiscal cycle of October 1 through September 30, so performance measures for the BPA-funded portion of the wildlife area are estimated and may change or not be accomplished depending on what the annual contract with BPA requires. Accomplishments and desired outcomes will be monitored and evaluated to produce an annual performance report. The wildlife area plan is a working document that will evolve as habitat and species conditions change, as new regulations are enacted, as public issues and concerns change, and as funding allows. Plan updates will address these changes.

1. The Wenas Wildlife Area performance measures for 2006 include:

- 46.5 miles of elk fence maintained.
- 7 miles of stock fence maintained.
- 8.6 miles of fire breaks maintained.
- 5 miles of old interior stock fence removed on the wildlife area.
- 20 acres of degraded shrub-steppe habitat planted with native species.
- 50 acres of habitat restoration plantings inter-seeded with native shrub-steppe species to increase habitat diversity.
- 50 acres of degraded shrub-steppe seeded with native shrub- steppe species.
- 0.5 miles of riparian habitat planted.
- 200 acres of restoration seeding fertilized.
- Weeds treated on 180 acres of the restoration seedings.
- Weeds treated on 145-acre Sheep Company fire.
- Weeds treated on 400 acres across the wildlife area.
- Weeds treated on at least 50 miles of roadside on the wildlife area.
- William's Pipeline crossing of Umtanum Creek modified to remove fish passage barrier.
- Design completed for installing a bridge or bottomless arch culvert at the Durr road crossing of Umtanum Creek
- 1.5 miles of the Ridge road maintained (700 feet relocated); 5.5 miles of Kelley Hollow road maintained (0.85 miles relocated)
- Fire contracts in place for wildlife area protection.
- DNR annual lease payment paid.
- Annual PILT and weed assessment paid to Yakima and Kittitas counties.
- Annual contract submitted to BPA.
- Annual BPA-required Statement of Work (SOW), budget, and quarterly and annual reports submitted for the BPA-funded portion of the wildlife area.
- Plans completed including wildlife area plan, weed plan, fire plan, and annual RMAP report.
- Contact with CAG maintained (two meetings, or contacts per year).
- Staff attended annual pesticide recertification workshops.
- Red card or blue card training completed by wildlife area staff.
- First aid training provided to staff.

APPENDIX 1: PUBLIC ISSUES/CONCERNS

The purpose of meeting with the CAG and DT was to obtain input to help guide management actions on the wildlife area. A draft of the introduction and history of the wildlife area and copies of the Agency's goals and objectives were distributed for review and discussion. Below is a list of issues and concerns identified by the CAG and DT. This input will assist in developing strategies to implement management goals and objectives. Underlined statements below indicate that the input was received from the DT. Issues that are not underlined originated from the CAG.

Issue A: Weed Management

- Develop posters on noxious weeds, post interpretative signage, and use other means to educate users on weed species, the way they are spread, and generally what to watch out for.
- Good progress being made, work with County Weed Boards.
- Should raise fines for illegal off-road travel as a way of financing some outreach and education.
- Begin educating with kids in school, just like hunter ed. Raise conservation awareness at an early age.
- Include something in the hunting/fishing pamphlets on weeds (and on the WDFW Website).
- Hit on user groups for help in outreach and projects.
- Many noxious weeds are spread by both domestic and wild animals.
- Weed spread by vehicle travel; focus on the roads first.
- Prepare an integrated weed management plan.
- Current and future use of bio-controls an important component.
- Reinforce the need for re-vegetation efforts once weeds are under control, and encouraging more of that type of work.
- Re-vegetation agreed to be a priority to improve habitat that has deteriorated as a result of weed infestation. Some commented that native over non-native is good if the native species are hearty and aggressive enough to compete and establish, but felt that sometimes non-native species are quicker to establish.
- Question asked if WDFW receives much public input and identification of problem areas by users of the Wildlife Areas. Response was that input by users has been an important way of identifying weed infestations, particularly in the more remote areas.
- Discussion followed with the consensus being that WDFW needs more education and interpretive signage and literature to help users know what species are weeds, how they are spread, and how they can be controlled.
- New seed mixes are being made available to the general public that are marketed as being attractive plants to wildlife. Many contain noxious weed seed in the mix.

Issue B: Recreation/Access

- Need more signage and education on littering.
- Limit camping to a maximum of 14 days within a 60-day period (during general hunting seasons, 21 days within a 60-day period).
- Acquire fee title or easements on key inholdings to maintain public access.

- Need increased enforcement on the wildlife areas.
 - o Off road vehicles, mudders, hill climbs, campfires, target shooting (safety issue), littering, damage to elk fence.
 - o Find new, more effective methods such as aerial reconnaissance, tell public how to report a violation (give them a phone number).
 - o Use annual report form enforcement to help focus efforts.
- Educate the public regarding public access and other regulations through green dot reader boards, other signage, and news releases. Issues include road management system, camping, fires, firewood cutting, permanent structures, mineral extraction, etc.
- Inventory public use of the areas using standard, consistent methods, such as vehicle counters.
 - o Use monitoring to focus efforts; determine objectives for monitoring.
 - o Identify key areas of public use.
 - o Consider how to use local knowledge.
- **Winter Range Protection:**
 - o If areas need to be closed seasonally to protect elk, then WDFW should do it.
 - o Regulate public access in big game wintering areas. Seasonally close roads, snowmobile use etc.
 - o Too many elk are being pressured (particularly in late winter/early spring) by 4-wheelers and other ATVs. Example: Bruton Road on Colockum Wildlife Area. How do we change that, enforce it, and improve the situation for elk?
 - o The degree to which a seasonal closures or restrictions are needed has to be established. WDFW must quantify it somehow to prove undue pressure on the animals (monitor the elk traffic for example). Enforcement is key, and tough to carry off. Also, is it mostly activity that is already illegal that is most of the problem?
 - o Elk depredation in the Kittitas Valley issue: can mean weighing recreational opportunity (legal or not) against economic loss to the agricultural community.
 - o Discussion on closure options; vehicle closure only versus closure to access of any kind.
 - o Other factors to consider that relate to private ownership. Example of the Skookumchuck, which is an area that lies directly between the Quilomene and Whiskey Dick Wildlife Areas. This renders all three hard to control and enforce.
 - o Suggestion that one place to start with the Quilomene, Whiskey Dick, and Colockum would be to post signs and notify to block approach by water.
 - o Public outreach is needed to help fight mudding and other illegal practices like chasing elk.
 - o USFS regulations vs. WDFW, county, other State, etc. can be a problem; particularly with ATVs (different regulations are confusing).
 - o Four-wheel clubs want to get involved in advocating legal use of the resources, and there is a need to reach out to them.
- **Road Management:**
 - o Most users on roads are hunters paying for licenses; they expect and deserve access.

- o Numerous hunters want less roads to improve hunting and reduce the number of lazy road hunters.
 - o Need for more enforcement presence on the wildlife areas. “You whack a few bad apples, and the word gets around.” More flights to check for off road use!
 - o Develop a reward system, for hunters reporting offenders.
 - o Limit access to permit only.
 - o Consider more road improvements on the roads we want the folks using (“harden the good roads”), to reduce illegal use of others and off-road infractions. Channel the people where we want them with road management and fence.
 - o Would hate to see the WAs become too restricted.
 - o Conduct more surveillance by staff or hidden camera at problem spots; also more gates in key places.
 - o Get volunteers (jeep club members and others) to work on some key spots (machinery and hand work) and routes. WDFW staff needs do outreach for help.
 - o WDFW should charge for Green Dot maps.
 - o Solid data and evidence of resource damage, etc. is needed to back up decisions for closure.
 - o Spend time with staff outlining things they need to document regularly when in the field. Get some data on paper, informal or not.
 - o WDFW shouldn’t worry so much about pleasing everyone, just do what is right. Only 10% gripe about what WDFW does for wildlife and habitat anyway.
 - o Closing road A may only mean more traffic for road B, and that always needs to be a consideration.
 - o Need to consider more seasonal closures and gates as an alternative to abandoning roads. Many people want to see the majority of roads remain open for travel when it is not a resource issue. Closing roads can also limit access for fire suppression.
 - o Need more signage and education to explain road management practices.
 - o Include rules and information with the new ATV paperwork at dealerships, educate to tread lightly, establish and enforce speed limits. Provide info in the hunting and fishing pamphlets.
 - o Work with Forest Service to resolve differences in green dot versus green diamond road management.
 - o Maintain/close roads to prevent impacts to water quality.
 - o Green dot is a good road management system for the type of open country that we are dealing with.
 - o When closing roads, use physical barriers where and when they can be effective.
- **Fences/Gates:**
 - o Maintain the elk fence.
 - o Firm statement that there are enough public access locations already in place. Agreement that only more problems would result if new access points were established.
 - **Target Shooting:**
 - o More signage and information is needed on the sites where target shooting occurs to reduce littering and use of inappropriate targets (glass, tv’s, washers/dryers).

- o A consensus was reached regarding the need for more enforcement presence by WDFW and by county deputies. Someone expressed the feeling that there is sometimes a climate of fear over who is out there shooting auto and semi-auto firearms.
- o No laws that restrict shooting on the wildlife areas, but safety issues, particularly at Sheep Company shooting area on the Wenas Wildlife Area, are real.
- o Look at creating backstops, formal ranges, or shooting restrictions.
- o Need an assessment of activity at Sheep Company shooting area on the Wenas Wildlife Area before permanent solutions can be proposed. May need to be manned by volunteers to watch people and take license plate numbers to help address the safety and littering issues.
- o Question as to whether or not it boiled down to designating only certain areas for shooting and or imposing sanctions for use other than what is acceptable? John responded that if we provide the place and promote the use in any fashion, it increases the liability for WDFW. Dumpsters were suggested, so that people can dump their shooting trash (apparently done in Montana). The managers agreed that more than shooting trash would soon be dumped.
- o CAG consensus suggested more outreach, and communication that the litter associated with these shooting areas is unacceptable. WDFW needs to publicize, inform, and make people aware.

Issue C: Grazing

- A consensus was reached that many riparian areas and degraded habitat should not be grazed, but the group recommended the agency use it as a tool where needed (with very strict controls imposed on it).
- A consensus was reached that grazing could be a good management tool, when used within strict guidelines for movement and rotation of stock. Timing is an essential component with regard to when land is grazed, and for how long.
- Generally the impact of spring grazing heavier than with fall grazing.
- WDFW needs to work with DNR and other agencies to control cattle grazing better, with riders, etc, and focus on protection of riparian and sensitive areas; require riders and or fencing to keep moves/rotations of cattle on track. Need better assessment tools, and strict time frames that are enforced.
- Some would like to see more grazing tried on WDFW lands. Some felt that it fits as an enhancement to grazing on private lands, can be of economic benefit, and also work to enhance habitat. Can be good for sage grouse habitat.
- Do the managers decide whether or not it is appropriate to try?
- It can be bad PR to discourage grazing, and limits revenue generated by the agency.
- It was stressed that grazing needed strict planning and control, and there are contractors who do that sort of thing (like Solar Dollars).
- The Tarpiscan snafu was mentioned, and the access that had been gated by a private individual as a result. Some felt that was a lost opportunity to cooperate with an adjacent landowner in good grazing practices, and the public lost an access to the Colockum Wildlife Area in the process.

Issue D: Fire Management

- Use media coverage to explain the reasons and justifications for prescribed burning.
- Need to be more consistent on implementation of campfire restrictions.
- Develop a fire plan. Treat fire (wild and prescribed) as an integral part of grassland and shrubland management. Recognize that fire is difficult to exclude.
- Question about existing contracts for fire districts or DNR to fight or control fires for WDFW.
- Discussion followed relative to liability in wildfire situations, the need for more adjacent landowner cooperation (whether public or private), and what success, or not, that WDFW has had with prescribed burning. The managers explained that it was pretty new for us other than on very small scale, and that the L.T. Murray work would be the first larger burn done in decades.

Issue E: Wildlife/Habitat Management

- Include watershed planning and multiple species habitat conservation plan (HCP) information in all management plans. Cooperate with Planning Units.
- Protect and restore PHS habitats.
- Restore shrub-steppe for sage grouse.
- Use appropriate tools to protect key habitats on private lands.
- Chapter 3.1 of the Wildlife Area Plans (Oak Creek and the L.T. Murray/Wenas): Andy Stepniewski (from Audubon and the Cowiche Canyon Conservancy) had questions about this chapter. He asked that if the target number of elk for the Yakima Herd was 9,500, did that not conflict with species diversity and habitat objectives. He was concerned with feed site elk and that concentrated impact, as well as adjacent impact in transition areas as those elk travel in and out. These elk are impacting other species in the concentrated areas. Andy subsequently submitted a letter outlining his concerns and comments in writing with good detail about species affected loss of biodiversity, and specific areas of concern.
- Ken McNamee of DNR suggested more focus on the importance of down logs and snags to wildlife. Many are removed every year by the illegal cutting of firewood on WDFW and DNR lands. Educate and inform with signage and in the hunting and fishing pamphlets, etc.

Issue F: Wildlife Damage

- What about night hunting for damage control? It has been effective in Oregon. What about seeking out those lead cows in herds causing damage during dark hours?
- Suggestion of outsourcing some functions such as damage assessments.
- Suggestion to augment natural controls by predators (cougars, wolves, etc.).
- What about ungulate damage to sensitive habitats, and overuse by not just cattle, but elk?
- Reduction in overgrazing at higher elevations (USFS lands as example) needed to relieve the pressure put on WDFW lands and lower range, agriculture lands and protected areas.
- More spot hunts need to be organized, but in a better fashion. More communication with adjacent landowners, better coordination across ownerships.

Issue G: Forest Management

- Statement made against DNR logging in the Naneum Basin and other areas on the Colockum Wildlife Area and the destruction of habitat, hiding cover, etc. Is purchase of some of it a solution? There are funding sources out there to pursue.
- Does WDFW have a timber/forest plan in place? Some areas are in need of thinning.
- Comment on the upcoming thinning/habitat improvement planned for an area of the Colockum Wildlife Area on WDFW land, and how that could be a revenue generator. All participants seemed to be ok with timber management objectives (removal of small fir, focus on the pine habitat, prescribed burning, seeding, etc.) that are currently occurring on the Wildlife Areas.
- The comment was made that if current thinnings were success stories, WDFW should get the word out, we needed the good public relations information in print to offset all of the negative that we invariably seem to get. “Let folks know!” Group stressed using the newspaper to promote this kind of work.
- WDFW needs to establish some clear criteria for timber practices on their lands.
- Lodgepole pine stands need to be treated differently, and when thinned. He cited two examples in the Wenatchee area.
- The suggestion was made that we relate our goals to past successful work, and work in progress.
- Encouragement was given to continue efforts to acquire the perpetual timber rights on all WDFW lands.

Issue H: Land Acquisition

- DFW needs to take better care of what we have.
- Acquire strategic, key habitats and land parcels.
- The discussion occurred regarding utilizing tools such as agreements with private landowners and private sportsmen’s clubs to work cooperatively on projects like turkey management and protection of game birds.
- The comment was made regarding the use of conservation easements; key is landowner incentives to participate, whether that be in the form of tax breaks or other.
- Discussion occurred regarding block management units in Montana where access to private lands adjacent to government lands bring day fees of \$10.00 or more per hunter. Benefit was providing control of hunting pressure by limiting the volume of hunters.
- The idea was made of incentive tags and or sale of access by other means.
- The general feeling was that private landowners definitely need some recourse, some incentives to allow wildlife on private ownership in any sort of density.
- Game species don’t recognize changes in ownership.
- The concern over the potential land swap between DFW and DNR was discussed, and the danger of differing management practices affecting wildlife and habitat. Some felt that there might be alternatives to the land swap that could still help both WDFW and DNR. Most felt cooperative management agreements are the key to the successful stewardship of public lands.

Issue I: Commercial Use/Non-Renewable Resource Extraction

- The WDFW Commercial Use Permits are too cheap, and the realistic market for this commercial use will bear more. There is money for wildlife and habitat projects to be gained.
- Commercial use fees need to go back into the wildlife area.
- Promote the cost/benefit, and it can also be a tool to focus use where we want use.
- Do the fees limit use and reduce impact, or if there should be more restrictions on commercial use?
- CAG members wanted to know how much really go back to the WA? Is it really fee for service? A consensus was reached that it should be.
- Some wildlife areas have the potential to make more money than others; should fee money go to the Wildlife Program and be distributed?
- We may need to be prepared to sacrifice some areas for undesirable uses. WDFW could designate some areas for use by motorbikes, mudders, and the like to help limit those uses in more critical areas. There was no consensus among the group members.
- The managers moved discussion on to commercial and related activity. They posed the question: Should we issue permits for rock pits, gold panning, removal of petrified wood, etc? There was some discussion about how this affects the habitat, who controls it, and who enforces it.
- Regarding mineral extraction and related activities, a consensus was reached that unless there is real money in it, or a benefit to fish and wildlife, then permits should not be issued at all. Discussion followed that spanned from rock hounds to gravel pits. There was a consensus that strict guidelines need to be established in the plan to define what is allowable, then WDFW needs to make users aware of the rules. The feeling was that many times folks did not know what was allowed, and what was not.

Issue J: Wildlife Releases:

- Regarding the wild turkey management plan: one individual was not supportive of only planting birds where a population already exists. One individual felt that the economic benefit of more release sites would outweigh other factors.
- There are differing opinions on whether or not the turkeys and other game birds should be winter-fed. Most felt that it was dependent on the quality of the habitat and how well they would survive, in the interim they should be fed in harsh winters, and over the long haul that good management and habitat development would create a climate for a healthy naturally sustained population. Everyone present felt that WDFW should manage for sustainable numbers.
- Some discussion on big horn sheep, more general comments supporting WDFW's winter-feeding programs for several species.

Issue K: Other

- Provide a headquarters/facility for the L.T. Murray/Quilomene/Whiskey Dick Wildlife Areas. Co-locate this facility with the district office.

APPENDIX 2: WENAS WEED MANAGEMENT PLAN

Weed Control Goals on WDFW Lands

The goal of weed control on Department lands is to maintain and improve the habitat for wildlife, meet legal obligations, provide good stewardship and protect adjacent private lands.

Weed control activities and restoration projects that protect and enhance fish and wildlife populations and their habitats on Department lands are a high priority. When managing for specific wildlife species on our lands the weed densities that trigger control are sometimes different than on lands managed for other purposes (e.g. agricultural, etc.). For example, if a weed is present at low densities and does not diminish the overall habitat value, nor pose an immediate threat to adjacent lands, control may not be warranted. WDFW focuses land management activities on the desired plant species and communities, rather than on simply eliminating weeds.

Control for certain, listed species is mandated by state law (RCW 17.10 and 17.26) and enforced by the County Noxious Weed Board. WDFW will strive to meet its legal obligation to control for noxious weeds listed according to state law (Class A, B-Designate, and county listed weeds).

Importantly, WDFW will continue to be a good neighbor and partner regarding weed control issues on adjacent lands. Weeds do not respect property boundaries. The agency believes the best way to gain long-term control is to work cooperatively on a regional scale. As funding and mutual management objectives allow, WDFW will find solutions to collective weed control problems.

Weed Management Approach

State law (RCW 17.15) requires that WDFW use Integrated Pest Management (IPM), defined as a coordinated decision-making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet agency programmatic pest management objectives, to accomplish weed control. The elements of IPM include:

Prevention- Prevention programs are implemented to keep the management area free of species that are not yet established but which are known to be pests elsewhere in the area.

Monitoring- Monitoring is necessary to implement prevention and to document the weed species, the distribution and the relative density on the management area.

Prioritizing- Prioritizing weed control is based on many factors such as monitoring data, the invasiveness of the species, management objectives for the infested area, the value of invaded habitat, the feasibility of control, the legal status of the weed, past control efforts, and available budget.

Treatment- Treatment of a weeds using biological, cultural, mechanical, and chemical control serves to eradicate pioneering infestations, reduce established weed populations below densities

that impact management objectives for the site, or otherwise diminish their impacts. The method used for control considers human health, ecological impact, feasibility, and cost-effectiveness.

Adaptive Management- Adaptive management evaluates the effects and efficacy of weed treatments and makes adjustments to improve the desired outcome for the management area.

The premise behind a weed management plan is that a structured, logical approach to weed management, based on the best available information, is cheaper and more effective than an ad-hoc approach where one only deals with weed problems as they arise.

Weed Species of Concern on the Wenas Wildlife Area

Weeds of concern on the wildlife area include Scotch thistle (*Onopordum acanthium*), Russian knapweed (*Acroptilon repens*), diffuse knapweed (*Centaurea diffusa*), whitetop (*Cardaria pubescens*), perennial pepperweed (*Lepidium latifolium*), houndstongue (*Cynoglossum officinale*), kochia (*Kochia scoparia*), musk thistle (*Carduus nutans*), Dalmatian toadflax (*Linaria dalmatica ssp. dalmatica*), Canada thistle (*Cirsium arvense*), Russian thistle (*Salsola iberica*) and cheatgrass (*Bromus tectorum*). This list is based on species that have been documented on or near the wildlife area (Table 3).

Table 3. Wenas Wildlife Area weeds including the state and county weed class listing and acres treated.

| Weed Species | 2005 State Weed Class | 2005 County Weed Class | Wildlife Area Unit(s) | 2005 Treated Acres |
|---|-----------------------|--------------------------------|---------------------------------------|--------------------|
| Musk Thistle | B | B-Designate | S. Umtanum R, N. Cleman M | <1 |
| Scotch Thistle | B | B-Designate | Umtanum Ri | 25 |
| Dalmatian Toadflax | B | B-Designate | Roza | <1 |
| Purple Loosestrife | B | B-Designate | Roza | <1 |
| Perennial Pepperweed | B | B-Designate in Co; B in Yakima | N. Cleman M | 20 |
| Houndstongue | B | B-Designate in Co; B in Yakima | S. Umtanum R, S. Umtanum R | 90 |
| Kochia | B | B-Designate in Co; B in Yakima | Umtanum Creek, Cleman M | 95 |
| Diffuse Knapweed | B | B | S. Umtanum R, Umtanum Creek, Cleman M | 440 |
| Russian Knapweed | B | B | S. Umtanum R, Umtanum Creek, Cleman M | 190 |
| Canada thistle | C | C | S. Umtanum R, Umtanum Creek, Cleman M | 220 |
| Whitetop | C | C | S. Umtanum R, Umtanum Creek, Cleman M | 70 |
| Russian thistle | | | S. Umtanum R, Umtanum Creek, Cleman M | 60 |
| Cheatgrass/ Bulbous bluegrass/ Foxtail barley | | | S. Umtanum R, Umtanum Creek, Cleman M | 240 |

B-Designate are state-listed and mandatory for control to prevent seed production/spread. New Invader is not an official state classification, but indicates the county reserves the right to implement control. R&S (Reduction and Suppression) Weeds are of wide distribution. Control along transportation corridors is recommended. Management for individual weed species can be found in the following “Weed Species Control Plan” (WSCP) sections.

CANADA THISTLE CONTROL PLAN

Scientific name: *Cirsium arvense*

Common name: Canada thistle

Updated: 2006

DESCRIPTION: Canada thistle is a colony-forming perennial from deep and extensive horizontal and vertical roots. Stems are 1 to 4 feet tall, ridged, and branching above. Leaves are alternate, lacking petioles, oblong or lance-shaped, divided into spiny-tipped irregular lobes. Flowers are purple and occasionally white, in heads ½ to ¾ inch in diameter.

Plants are male or female (Dioecious) and often grow in circular patches that are one clone and sex. At flowering, female flowers can be readily distinguished from male flowers by the absence of pollen (abundant in male flowers) and presence of a distinct vanilla-like fragrance. A female Canada thistle plant can produce up to 5,200 seeds in a season but the average is about 1,500 seeds/plant. Seed may be transported long distances by water, wind, or attached to animals, clothing, farm equipment and vehicles. Seed can remain viable in soil up to 20 years.

Over-wintering roots develop new underground roots and shoots in January and begin to elongate in February. Shoots emerge between March and May, when mean weekly temperatures reach 5 degrees C, and form rosettes. Early in the season plants remain near the soil surface until long days, over 14 hours of light, trigger flower stem elongation. Flowering occurs from June to October. Seeds mature July to October.

Canada thistle thrives in the Northern Temperature Zone due to its day length response and a high temperature limitation on growth. Although it mainly invades disturbed areas, it does invade native plant communities, open meadows (including wetlands), and ponderosa pine savanna. Canada thistle is adapted to a wide range of soil types and environmental conditions. It is best adapted to rich, heavy loam, clay loam and sandy loam, with an optimal soil depth of 20 inches. It can tolerate saline soils and wet or dry soil. Canada thistle usually occurs in the 17-35 inch annual precipitation zones or where supplemental soil moisture is available.

Canada thistle spreads rapidly through its horizontal roots, which give rise to shoots. Its root system can be extensive, growing horizontally as much as 18 feet in one growing season. Most Canada thistle patches grow at a rate of 3-6 feet per year, crowding out more desirable species and creating thistle monocultures.

Canada thistle is a state-listed class C noxious weed in Kittitas and Yakima Counties.

MANAGEMENT INFORMATION:

The key principal to Canada thistle control is to stress the plant and force it to use stored root nutrients. Canada thistle can recover from almost any stress, including control attempts, because of root nutrient stores. Success requires a sound management plan implemented over several years.

Mowing meadows can be an effective tool for Canada thistle control if combined with herbicide treatments. Mowing alone is not effective unless conducted at one-month intervals over several growing seasons.

Curtil (clopyralid + 2,4-D) and Transline (clopyralid), Tordon (picloram), Banvel/Vanquish/Clarity (dicamba) and Telar (chlorsulfuron) are effective against Canada thistle. These herbicides are most effective when combined with cultural and/or mechanical control.

Several insects are currently being used as bio-control agents for Canada thistle. *Ceutorhyncus litura* is a weevil whose larvae bore into the main leaf vein, then down into the plant's crown area. If the insect population is high enough, plant death can occur; otherwise Canada thistle is stressed and less vigorous. The Canada thistle stem gall fly (*Urophora cardui*) also can kill or stress the plant. The female lays eggs on apical meristems of developing shoots. Larvae burrow into shoots. Their feeding triggers huge galls to form that stress the plant. Galls that form near the terminal meristems keep the weed from flowering and reduce seed set.

CURRENT DISTRIBUTION ON THE SITE

Canada thistle is found throughout the Wenas Wildlife Area from low elevation shrub steppe environments to higher elevation forested zones. It often occurs along riparian zones in the major creeks and streams of the area, and is also seen in areas disturbed logging, especially in slash piles and landings.

ACRES AFFECTED BY WEED: 1,000 **WEED DENSITY:** Low

GOALS

Decrease occurrence of Canada thistle on the Wenas Wildlife Area.
Increase quality of infested plant communities.

OBJECTIVE

Survey and map existing Canada thistle populations.
More accurately calculate the acres affected by Canada thistle.
Reduce Canada thistle densities by using an integrated weed management approach.
Rehabilitate degraded areas with competitive native plants.

ACTIONS PLANNED

Continue Canada thistle control with chemical, mechanical and cultural methods.
Research biological control agents for release on the Wildlife Area.

CONTROL SUMMARY AND TREND

Canada thistle has been controlled on the Wildlife Area as it has been encountered during other weed control activities. Increased logging activity on the Wildlife Area may be contributing to the proliferation of this weed.

2002- Approximately 100 acres were treated.

2003- Approximately 120 acres were treated.

2004- Approximately 160 acres were treated.
2005- Approximately 220 acres were treated.

CHEATGRASS CONTROL PLAN

Scientific name: *Bromus tectorum*

Common name: Cheatgrass, downy brome

Updated: 2006

DESCRIPTION: Cheatgrass is an erect winter or spring annual grass. The seedlings are bright green with conspicuously hairy leaves, hence the alternate common name, downy brome. It typically grows 20-24 inches tall, with a finely divided, fibrous root system that may reach a depth of about 12 inches. The stems are erect, slender and glabrous or may be slightly soft-hairy. The nodding, open panicles with moderately awned spikelets are very distinctive. Cheatgrass panicles change color from green to purple to brown as the plant matures and eventually dries out. The spikelets readily penetrate fur, socks and pants and its seeds may thus be widely dispersed by people and animals.

Cheatgrass normally germinates in the fall. The leaves typically grow little in the fall, and plants are normally 0.8-2 inches high when covered with snow around December. Cheatgrass roots will continue to grow throughout the winter until soil temperatures drop below 37 degrees F. Cheatgrass grows rapidly in early spring and soil temperature appears to be the most important factor. Plants head out in late April to early May and seeds mature in mid to late June.

Cheatgrass is an alien grass that dominates disturbed ground in shrub-steppe ecosystems of the Western United States and Canada. Cheatgrass reproduces only from seeds, germinates in the fall or winter, expands its roots over winter, and rapidly exploits the available water and nutrients in early spring. It is common in recently burned rangeland, wildlands, winter crops, waste areas, abandoned fields, eroded areas, and overgrazed grasslands. In undisturbed sites, cheatgrass will most commonly spread along soil cracks and work its way outward into the natural community. Cheatgrass is a very efficient competitor for early spring moisture, which would otherwise be used by native perennial grasses. In this way, the species can displace native vegetation and inhibit natural succession.

The change induced by cheatgrass in the fire cycle frequency is probably the species' greatest competitive advantage. Although fire is a natural part of the sagebrush grassland ecosystem, those fires usually occurred at intervals between 60-100 years. Cheatgrass infested areas burn at a much greater frequency, every 3-5 years. At this frequency, native shrubs and perennial grasses cannot recover and after a few cycles a cheatgrass monoculture develops.

MANAGEMENT INFORMATION:

The most effective control of cheatgrass involves adopting an integrated management approach that may include mowing and burning, chemical applications, and reseeding with competitive plants.

Mowing cheatgrass can be somewhat effective at controlling cheatgrass seed production, but must be repeated often in the spring, especially during wet periods. Mowed cheatgrass plants will tiller and produce new seeds if moisture is available.

Cheatgrass is a highly flammable species due to its complete summer drying, its fine structure, and its tendency to accumulate litter. A fire will reduce the plants to ash, but fire intensity may not be great enough to consume the litter layer, and the seeds in the soil will probably survive. If a burn is not followed by re-seeding cheatgrass will recover to pretreatment proportions within 3 to 4 years.

There are several types of herbicides that can be used alone or combined to provide effective control of cheatgrass. Roundup (glyphosate) effectively controls cheatgrass, but is non-selective. Roundup is often used in fallow crop fields to control cheat and preserve moisture for the next crop. Treflan (trifluralin), Hoelon (diclofop), Sencor (metribuzin), Finesse (metsulfuron), and Glean (chlorsulfuron) are herbicides commonly used to control cheatgrass in grain crops. Fusilade (fluazifop-p-butyl), Poast (sethoxydim), and Assure (quizalofop) are effective at controlling cheatgrass without harming broadleaf most broadleaf plants. Residual, non-selective control of cheatgrass in industrial sites, parking areas and similar areas can be accomplished with herbicides such as Krovar (diuron) or Casoron (dichlobenil). Several of these products can be effective at controlling cheatgrass in non-crop, rangeland or conservation reserve program (CRP) areas without harming desirable vegetation. Rates and timing are critical to avoid damage to perennial plants.

CURRENT DISTRIBUTION ON THE SITE

Cheatgrass is present throughout the Wenas Wildlife Area. It is especially prevalent in old agricultural fields, degraded rangelands and in fire-prone areas.

ACRES AFFECTED BY WEED: 20,000

WEED DENSITY: low-high

GOALS

Decrease occurrence of cheatgrass on the Wenas Wildlife Area.
Increase quality of infested plant communities.

OBJECTIVE

Survey and map severe cheatgrass infestations.
More accurately calculate the acres affected by cheatgrass.
Reduce cheatgrass densities by using an integrated weed management approach.
Rehabilitate degraded areas with competitive native plants.

ACTIONS PLANNED

2006: Control cheatgrass on 200 acres by herbicide application, mowing and reseedling.

CONTROL SUMMARY AND TREND

Recent success has been achieved on the Wildlife Area using herbicides (including pre-emergent herbicides), reseedling, and mowing.

2002- Approximately 80 acres were treated.
2003- Approximately 120 acres were treated.
2004- Approximately 150 acres were treated.
2005- Approximately 169 acres were treated.

DALMATIAN TOADFLAX CONTROL PLAN

Scientific name: *Linaria dalmatica ssp. dalmatica* **Common name:** Dalmatian toadflax
Updated: 2005

DESCRIPTION: Dalmatian toadflax is an erect, short-lived, perennial herb, 0.8 to 1.5 m tall. Dalmatian toadflax is a perennial species that spreads by horizontal or creeping rootstocks and by seed. A mature plant can produce up to 500,000 seeds, which are primarily dispersed by wind. The seeds may live up to ten years in the soil (Robocker 1974; Morishita 1991). Most seedlings emerge in the spring when soil temperature reaches 8° C at 2.5 cm. Germination in the fall is probably limited by soil water content, as well as possibly seed dormancy with the average life span of a plant being three years (Robocker 1974).

Mature Dalmatian toadflax plants are strongly competitive. Studies indicate that plots without Dalmatian toadflax may produce two and a half times as much grass as plots with toadflax (Robocker 1974). Mature plants are especially competitive with shallow-rooted perennials and winter annuals. Because of its competitive ability, Dalmatian toadflax is a concern in pasture and rangelands, as well as in natural areas, where it may out-compete more desirable, native species. Dalmatian toadflax occurs in a variety of habitats, including: roadsides, pastures, rangelands, and waste areas. It has spread most extensively west of the 100th meridian, occurring primarily on coarse-textured soils, ranging from sandy loams to coarse gravels (Alex 1962).

Dalmatian toadflax is a state-listed class B-Designate in the management areas.

MANAGEMENT INFORMATION:

Intensive clean cultivation can effectively control Dalmatian toadflax. A successful approach includes at least a two year effort, with eight to ten cultivations in the first year and four to five cultivations in the second year (Morishita 1991; Butler and Burrill 1994). Cultivation should begin in early June and be repeated so that there are never more than seven to ten days with green growth visible (Butler and Burrill 1994). Since Dalmatian toadflax seedlings do not compete well for soil moisture against established winter annuals and perennials, control efforts should include attempting to establish and manage desirable species that will compete with toadflax (Morishita 1991; Butler and Burrill 1994).

Herbicide can be an effective tool for control and applicators should refer to the PNW Weed Management Handbook, or other reputable resources, for product recommendations and timing.

Calophasia lunula, a defoliating moth, is well-established in Washington and reportedly provides good control (William et al. 1996) and *Mecinus janthinus*, a recently introduced stem boring weevil, shows promise. *Brachypterolus pulicarius*, although usually associated with yellow toadflax, can survive and may reduce seed production of Dalmatian toadflax.

CURRENT DISTRIBUTION ON THE SITE

Found along the Yakima River and other riparian zones.

ACRES AFFECTED BY WEED: ~0.5 **WEED DENSITY:** Low (Widely Scattered)

GOALS

Control existing populations
Prevent new occurrences

OBJECTIVES

Survey and map existing populations
More accurately calculate the acres affected by Dalmatian toadflax
Treat all plants before they produce seed
Survey nearby areas for pioneering infestations

ACTIONS PLANNED

In 2006 the known infestations will be spot treated in the spring.

CONTROL SUMMARY AND TREND

2003- Approximately 1 acre hand pulled.

2004: Approximately .5 acres treated.

2005: Approximately .5 acres treated.

DIFFUSE KNAPWEED CONTROL PLAN

Scientific name: *Centaurea diffusa*

Common name: Diffuse knapweed

Updated: 2006

DESCRIPTION: Diffuse knapweed is a diffusely branched biennial or short-lived perennial herb, 1 to 2 feet tall. It is a native from southern Europe to north-central Ukraine. This species reproduces only by seed. Diffuse knapweed plants first form low rosettes and may remain in this form for several years depending on environmental conditions. Rosettes over-winter and bolt in early spring. Floral buds are formed in early June, flowering occurs in July and August, and mature seeds are formed by mid-August. Flowers are generally white. A single diffuse knapweed plant can produce up to 18,000 seeds. Seed dispersal is mainly by wind. When the seed capsule sways in the breeze or is disturbed, the seeds fall from the small opening in the top of the flower head and are distributed around the parent plant. However, most involucre remain closed until the plant dries up, breaks off at ground level and effectively becomes a tumbleweed, dispersing seeds over long distances. The stalks readily lodge under vehicles, expanding their dispersal.

Diffuse knapweed is a pioneer species that can quickly invade disturbed and undisturbed grassland, shrub land and riparian communities. It is generally found on light, dry, porous soils. Once established, it out competes and reduces the quality of desirable native species. Diffuse knapweed contains allelopathic chemicals, which can suppress competitive plant growth and create single species stands. Diffuse knapweed stands can range in density from 1-500 plants/m². The replacement of native grasslands with knapweed can reduce biological activity and increase soil erosion.

Diffuse knapweed is a state-listed class B weed. In Yakima and Kittitas Counties it has spread rapidly and now infests roadsides, waste areas, disturbed sites, lots, pastures, forests and rangelands.

MANAGEMENT INFORMATION:

Diffuse knapweed is best controlled by a combination of chemical, mechanical and biological methods. Herbicides such as Tordon (picloram), Transline (clopyralid), Curtail (clopyralid + 2,4-D) or Banvel (dicamba) can control diffuse knapweed. A single application of Tordon may control knapweed for two to three years, but the weeds will reinvade the area unless other management techniques are used.

Hand pulling and mowing can reduce knapweed densities, but must be repeated for several years to prevent seed production and deplete the soil seed bank. Much progress has also been made in biological control of diffuse knapweed, with several insects now available that can dramatically reduce knapweed infestations. Seeding competitive, desirable native plants after control of knapweed is required to prevent reinvasion.

CURRENT DISTRIBUTION ON THE SITE

Encompasses all the Wenas Wildlife Area from 600' to 5000' in elevation. It is found most commonly along roadsides, in and around agricultural fields and in degraded rangelands on the Wildlife Area.

ACRES AFFECTED BY WEED: 10,000 **WEED DENSITY:** Low-Medium

GOALS

Decrease occurrence of diffuse knapweed on the Wenas Wildlife Area.
Increase quality of infested plant communities.

OBJECTIVES

Survey and map existing populations.
More accurately calculate the acres affected by diffuse knapweed.
Reduce knapweed densities by chemical, cultural and biological methods.
Rehabilitate degraded areas with competitive native plants.

ACTIONS PLANNED

Continue chemical applications on local infestations where feasible, such as in agricultural fields or along roadsides and parking areas.
Continue release of biological control insects across the Wildlife Area.

CONTROL SUMMARY AND TREND

2001: 2,000 seed-eating weevils (*Larinus minutus*) released.
2002: Approximately 130 acres treated. 5,000 *Larinus* released.
2003: Approximately 253 acres treated.
2004: Approximately 275 acres treated.
2005: Approximately 432 acres treated.

Diffuse knapweed control has reduced weed infestations and occurrence across the wildlife area. Roadsides have been consistently treated to stop seed production and spread by vehicles. Release of insects (*Larinus minutus*) has significantly reduced knapweed populations in the most heavily infested areas.

HOUNDSTONGUE CONTROL PLAN

Scientific name: *Cynoglossum officinale*

Common name: Houndstongue

Updated: 2006

DESCRIPTION: Houndstongue is an erect biennial or short-lived perennial that is native to Eurasia and has spread rapidly throughout the United States and Canada. It grows from 1 to 4 feet tall and has a thick, deep taproot. The leaves are alternate and are hairy, rough and lacking teeth or lobes. The flowers are a dull reddish-purple and the seeds are ovoid, flat on top with a scar that runs near the lower surface. Seeds germinate from February to May. A rosette forms the first year, it flowers during June the following year, and seeds are formed and dropped at the end of the summer. Houndstongue is a self-pollinator that can produce up to 674 seeds per plant. Seeds remaining on the soil surface can remain viable up to two years.

Houndstongue is a highly competitive weed whose seed attaches to animal hair and clothes and can be distributed long distances. Once the seeds cling to animals, they are very hard to remove which can lower the value of sheep and can cause irritation and behavioral problems in cattle. Houndstongue contains pyrrolizidine alkaloids that can stop the reproduction of liver cells in livestock.

Houndstongue prefers regions with hot, dry summers and cold winters and can withstand severe drought. It is a shade tolerant plant found primarily in open coniferous and deciduous forests. It thrives in wetter grasslands, although it is also found on roadsides, meadows and disturbed areas.

Houndstongue is a state-listed class B-designate noxious weed in Kittitas County and a class B noxious weed in Yakima County.

MANAGEMENT INFORMATION:

The best control of houndstongue results from an integrated management approach. Maintaining forest, pasture and rangeland in good condition is a primary factor for musk thistle management. To favor competitive grass growth, do not overgraze. Cultivation of young rosettes in the autumn or early spring gives effective control. Mowing flowering stems close to the ground is an effective way to reduce seed set. Clipping during the second year flowering can also greatly reduce seed production.

Herbicides found to be effective on houndstongue include Tordon (picloram), Transline (clopyralid), and Banvel (dicamba). Apply these herbicides in spring or fall to houndstongue rosettes. The use of a silicone surfactant is important to enhance penetration. Due to the transportability of the seed, it is important to watch for new infestations.

No biological controls are available for houndstongue. There is a root weevil, *Mogulones cruciger*, that has been very effective on houndstongue in Canada, but it has not been approved in the United States due to concerns over the possibility of it impacting native borages.

CURRENT DISTRIBUTION ON THE SITE

Houndstongue is currently found in Black, Ladybug and Lemon canyons in the South Umtanum Ridge Unit.

ACRES AFFECTED BY WEED: 25 acres

WEED DENSITY: Low

GOALS

Eliminate houndstongue from the Wenas Wildlife Area.
Increase quality of infested plant communities.

OBJECTIVES

Survey and map existing houndstongue populations.
More accurately calculate the acres affected by houndstongue.
Reduce houndstongue densities by using a integrated weed management approach.
Rehabilitate degraded areas with competitive native plants.

ACTIONS PLANNED

Continue chemical applications on known infestations where feasible.
Continue cutting flower heads when appropriate.
Research new advances in biological control of houndstongue.

CONTROL SUMMARY AND TREND

2002: Approximately 5 acres treated
2003: Approximately 23 acres treated
2004: Approximately 11 acres treated
2005: Approximately 20 acres treated

MUSK THISTLE CONTROL PLAN

Scientific name: *Carduus nutans*

Common name: Musk Thistle

Updated: 2006

DESCRIPTION: Musk thistle is an erect, freely branching biennial weed native to Europe and Asia. It is a deep, tap-rooted plant that grows up to 8 feet tall. The waxy leaves are dark green with a green midrib and mostly white margins. The large flowers are terminal, flat, nodding, purple, sometimes white and surrounded by numerous lance-shaped, spine-tipped bracts. Seedlings usually emerge early in spring, develop into rosettes and spend the first season in this growth stage. Seedling emergence can also occur in the fall. Early in the spring of the second year, over-wintered rosettes resume growth. Shoots bolt in late March through May. Musk thistle flowers and begins to produce seed 45 to 55 days after it bolts. Musk thistle is a prolific seed producer. One plant can produce up to 20,000 seeds, although only one-third of the seeds are viable. Seeds appear to remain viable for at least 10 years.

Musk thistle is a highly competitive weed, which invades disturbed areas, pastures, rangeland, forest land, cropland and waste areas. It does not appear to have any specific climatic requirements other than a cool period of vernalization for flowering. Musk thistle establishes best on bare soil, and small shallow cracks are ideal for seedling establishment. It grows in all soils, but soils must be well-drained. Musk thistle spreads rapidly and forms extensive stands, which force out desirable vegetation. Musk thistle may produce allelopathic chemicals that inhibit desirable plants.

Musk thistle reproduces by seed only. Wind and water are good dissemination methods and seeds also spread by animals, machinery and vehicles.

Musk thistle is a state-listed class B noxious weed in Yakima and Kittitas Counties.

MANAGEMENT INFORMATION:

The best control of musk thistle results from an integrated management approach. Maintaining forest, pasture and rangeland in good condition is a primary factor for musk thistle management. To favor competitive grass growth, do not overgraze. Musk thistle can easily be removed by severing its root below the ground with a shovel or hoe. Mowing can effectively reduce seed output if plants are cut when the terminal head is in the late-flowering stage. Gather and burn mowed debris to destroy any seed that has developed.

Several herbicides are effective on musk thistle, including Tordon (picloram), Curtail (clopyralid+2,4-D), and Banvel (dicamba). Apply these herbicides in spring or fall to musk thistle rosettes. The use of a good surfactant will enhance penetration. Due to the long seed viability of musk thistle, control methods may have to be repeated for many years to completely eliminate a stand.

Several seed head weevils (*Rhinocyllus* and *Trichosirocalus* spp.) may be available and can reduce seed production significantly.

CURRENT DISTRIBUTION ON THE SITE

Encompasses all the Wenas Wildlife Area from shrub steppe lowlands to higher elevation forests. Musk thistle is often found in disturbed forest sites such as logged areas, skid trails and landings, and along roads.

ACRES AFFECTED BY WEED: < 10 acres

WEED DENSITY: Low

GOALS

Decrease occurrence of musk thistle on the Wenas Wildlife Area.
Increase quality of infested plant communities.

OBJECTIVES

Survey and map existing musk thistle populations.
More accurately calculate the acres affected by musk thistle.
Reduce musk thistle densities by using an integrated weed management approach.
Rehabilitate degraded areas with competitive native plants.

ACTIONS PLANNED

Continue chemical applications on known infestations where feasible.
Continue digging and cutting flower heads when appropriate.
Research new advances in biological control of musk thistle.

CONTROL SUMMARY AND TREND

2002: Approximately 8 acres treated
2003: Approximately 1 acres treated
2004: Approximately 1 acres treated
2005: Approximately 1 acres treated

PERENNIAL PEPPERWEED CONTROL PLAN

Scientific name: *Lepidium latifolium*

Common name: Perennial Pepperweed

Updated: 2006

DESCRIPTION: Perennial Pepperweed is an erect, branching, perennial forb that grows one to three feet high, but may reach heights of eight feet in wet areas. The base of the stems is semi-woody. The roots enlarge at the soil surface to form a woody crown. The toothed leaves are lance-shaped and are bright green to gray-green and may have a leathery texture. Dense white flower clusters of six to eight tiny blossoms occur near the ends of the stems around mid-June. Perennial pepperweed is a prolific seed producer, capable of producing more than six billion seeds per acre of infestation. In addition to seeds, perennial pepperweed spreads by creeping underground roots (rhizomes) that may grow to a length of ten feet. New plants shoot up from the underground roots and enable perennial pepperweed to form dense monocultures.

Perennial pepperweed is most often found in open, un-shaded areas on disturbed and often saline soils. It is common in riparian areas, valley bottoms, and seasonally wet areas. It is a very competitive species that crowds out desirable vegetation and results in dense monocultures and a decrease in biodiversity. When established along rivers and streams, the plant interferes with the regeneration of willows and cottonwoods, reducing the quality of habitat for wildlife.

Perennial pepperweed spreads in many ways. The plant commonly travels in rivers and irrigation systems as seeds and rhizomes from eroded banks. Seeds are transported when they attach themselves to machinery and vehicle tires.

Perennial pepperweed is a state-listed class B-designate weed in Kittitas County and a class B weed in Yakima County.

MANAGEMENT INFORMATION:

The best method of managing perennial pepperweed is to prevent the weed from becoming well established. Minimizing soil disturbances from vehicles, machinery and overgrazing will reduce areas where the weed might become established. Heavy, vigorous grass stands that are properly managed can limit the establishment of this weed.

Once perennial pepperweed is established, control is difficult because the plant is so competitive and spreads rapidly by its creeping roots. The weed is usually found on sites difficult to access and along waterways where control presents special challenges. Eradication of perennial pepperweed is impossible in most cases. Instead, efforts and resources should be focused on preventing its spread and using an integrated weed management program.

Mechanical control of perennial pepperweed is not recommended. Digging, mowing and tilling will only encourage new plants to sprout from the root crown and creeping roots. Chemical control of perennial pepperweed is best achieved by using Telar (chlorsulfuron) or Escort (metsulfuron). Apply Telar during bud to early bloom stage, and apply Escort before bud and bloom, but while plants are actively growing. To successfully manage perennial pepperweed

with chemicals, competitive vegetation must be established immediately after its control to prevent reinvasion.

CURRENT DISTRIBUTION ON THE SITE

On the Wenas Wildlife Area perennial pepperweed is found along streams, creeks and other riparian zones. It is common in disturbed areas such as old homesteads and abandoned agricultural fields in valley bottoms.

ACRES AFFECTED BY WEED: 60

WEED DENSITY: Low

GOALS

Decrease occurrence of perennial pepperweed on the Wenas Wildlife Area.
Increase quality of infested plant communities.

OBJECTIVES

Survey and map existing populations.
More accurately calculate the acres affected by perennial pepperweed.
Reduce pepperweed densities by using an integrated weed management approach.
Rehabilitate degraded areas with competitive native plants.

ACTIONS PLANNED

Continue chemical applications on local infestations where feasible.
Research the availability of biological controls (insects) for perennial pepperweed.

CONTROL SUMMARY AND TREND

2002: Approximately 18 acres treated.
2003: Approximately 26 acres treated
2004: Approximately 34 acres treated
2005: Approximately 20 acres treated

PURPLE LOOSESTRIFE CONTROL PLAN

Scientific name: *Lythrum salicaria*

Common name: Purple Loosestrife

Updated: 2006

DESCRIPTION: Purple loosestrife is an erect, long-lived perennial forb or sub-shrub introduced from Europe. The square, annual stems arise from a perennial rootstock and often grow 6-8 feet tall. The leaves are lance-shaped and entire, and are whorled. The magenta-colored flowers are arranged in racemes. A single flowering stalk can produce 300,000 seeds and densities as high as 80,000 stalks per acre have been recorded. Purple loosestrife seed may remain viable for up to 20 years.

Purple loosestrife usually occurs in marshes, wet meadows, stream banks, and the shores of lakes and wetlands. It is commonly associated with cattails, reed canary grass, sedges, bulrushes, reeds, and willows. Purple loosestrife can tolerate a wide range of growing conditions (up to 50% shade), can grow on calcareous and acidic soils and will even grow in standing water.

Purple loosestrife is an aggressive invader of wetlands. Spring established seedlings grow rapidly and produce flowers 8 to 10 weeks after germination. Purple loosestrife germinates at such high densities that it out competes native seedlings. The invasion of purple loosestrife leads to a loss of plant diversity, which also leads to a loss of wildlife diversity. If left unchecked, the wetland eventually becomes a monoculture of loosestrife.

Purple loosestrife seeds are mainly distributed by water, but can also be dispersed by animals and humans. Seeds do not drop from the seed capsules until the air temperature becomes cold in the fall. The plant also reproduces by rhizomes, and detached root or stem fragments can take root and develop into flowering stems.

Purple loosestrife is a state-listed class B-designate weed in Kittitas and Yakima Counties.

MANAGEMENT INFORMATION:

Loosestrife populations, which extend over three acres are difficult to eradicate and may be a better target for containment rather than control. The key to effective control is early detection when infestations are small. It is fairly easy to control small numbers of loosestrife plants when the seed bank in the soil is small. Small loosestrife infestations should be eradicated by hand-pulling or herbicide application. Herbicides available for use in wetlands are limited. Biological control of loosestrife has shown very promising results. The *Galerucella* beetle defoliates the leaves and buds of the plant, and should be considered where the population of loosestrife has become large or inaccessible. However, 100% control is not feasible with the use of beetles alone.

CURRENT DISTRIBUTION ON THE SITE

It has been found along the Yakima River by the Kittitas County Weed Board.

ACRES AFFECTED BY WEED: Unknown

WEED DENSITY: Low

GOALS

Decrease occurrence of purple loosestrife on the Wenas Wildlife Area.
Increase quality of infested plant communities.

OBJECTIVES

Survey and map existing purple loosestrife populations.
More accurately calculate the acres affected by purple loosestrife.
Reduce purple loosestrife densities by using an integrated weed management approach.
Rehabilitate degraded areas with competitive native plants.

ACTIONS PLANNED

Continue chemical applications on individual plants and small infestation where possible.
Encourage biological controls (insects) by restricting the use of insecticides in wetlands.

CONTROL SUMMARY AND TREND

Kittitas County Weed Department has treated a small, unknown acreage along the Yakima River.

RUSSIAN KNAPWEED CONTROL PLAN

Scientific name: *Centaurea repens*

Common name: Russian Knapweed

Updated: 2006

DESCRIPTION: Russian knapweed is a creeping, herbaceous perennial that reproduces from seed and vegetative root buds. Shoots or stems are erect, 18 to 36 inches tall, with many branches. Flowers are urn-shaped, solitary and can be pink, lavender or white. Russian knapweed has vertical and horizontal roots that have a distinctive, brown to black, scaly appearance. It emerges in the early spring, bolts in May to June, and flowers through the summer into fall. It produces seeds sparingly, approximately 50 to 500 per shoot. Seeds are viable for two to three years in soil. Its primary method of reproduction is from vegetative propagation, with seeds of secondary importance.

Russian knapweed is native to southern Ukraine, southeast Russia, Iran, Kazakhstan and Mongolia. Locally, it can commonly be found along roadsides, riverbanks, irrigation ditches, pastures, waste places, clear cuts, and croplands, especially in areas of high water tables. It is not restricted to any particular soil but does especially well on clay soils. Russian knapweed typically invades degraded areas, dominating the plant community by forming dense colonies. It uses a combination of adventitious shoots and allelopathic chemicals to spread outward into previously undisturbed areas. Vertical roots can penetrate the soil up to 8 feet. Russian knapweed contains an allelopathic polyacetylene compound, which inhibits the root growth of competing plants. Stands may survive 75 years or longer.

Russian knapweed is state-listed class B weed. It is a relatively new invader to Kittitas County and is spreading rapidly.

MANAGEMENT INFORMATION:

The most effective method of control for Russian knapweed is to prevent its establishment through proper land management. The healthier the natural community, the less susceptible it will be to Russian knapweed invasion. In areas already infested, the key to control is to stress the weed and cause it to expend nutrient stores in its root system. An integrated approach usually is more successful than one control technique. Mowing Russian several times a year can help suppress the plant. Applications of herbicides such as Tordon (picloram), Curtail (clopyralid + 2,4-D) and Escort (metsulfuron) and Roundup (glyphosate) can also suppress the weed, but in most cases an herbicide alone will not effectively manage Russian knapweed. Herbicide treatment, tillage to overcome the allelopathic effects of the plant and reseeding with competitive vegetation (e.g. perennial grasses) show the most effective results.

CURRENT DISTRIBUTION ON THE SITE

Found throughout the Wenas Wildlife Area from low to mid elevations in riparian zones, meadows and agricultural fields. The main concentrations occur in the Roza and Umtanum drainages (Roza and Umtanum Creek Units), as well as in the Cottonwood drainage (South Umtanum Ridge Unit).

ACRES AFFECTED BY WEED: 500

WEED DENSITY: Low

GOALS

Decrease occurrence of Russian knapweed on the Wenas Wildlife Area
Increase quality of infested plant communities.

OBJECTIVES

Survey and map existing Russian knapweed populations.
More accurately calculate the acres affected by Russian knapweed.
Reduce Russian knapweed densities by chemical, mechanical and biological methods.
Rehabilitate degraded areas with competitive native plants.

ACTIONS PLANNED

Continue chemical applications on local infestations where feasible.
Use tillage and reseeded where possible.
Research new advances in biological control of Russian knapweed.

CONTROL SUMMARY AND TREND

2002: Approximately 360 acres treated.
2003: Approximately 420 acres treated.
2004: Approximately 295 acres treated.
2005: Approximately 187 acres treated.

Control has slowly reduced the number of acres affected by Russian knapweed on the Wenas Wildlife Area. Control is complicated by its prevalence in remote locations and proximity to high value riparian zones.

RUSSIAN THISTLE CONTROL PLAN

Scientific name: *Salsola iberica*

Common name: Russian thistle, tumbleweed

Updated: 2006

DESCRIPTION: Russian thistle is a brushy summer annual with numerous slender ascending stems that become quite woody at maturity. Stems are from 8 to 36 inches in length and usually have reddish to purplish stripes. Seedlings have very finely dissected leaves that are fleshy, dark green and about 1 inch in length. As the plant matures in July to October the older leaves are short and stiff with a sharp-pointed tip. The overall shape of the plant becomes oval to round and may attain a diameter of 18 inches to 6 feet at maturity. After the plant dries, the base of the stem becomes brittle and breaks off at soil level during fall and early winter. This round, thorny plant is capable of dispersing seed for miles as they tumble along in the wind. A large Russian thistle plant may produce 200,000 seeds.

The Russian thistle seed is a naked, coiled embryo that begins to uncoil when it is exposed to the proper temperature (52 to 90 deg. F) and moisture conditions. As it uncoils, the taproot extends into the soil within about 12 hours, making the germination period quite rapid and giving Russian thistle a decided advantage under limited moisture conditions. A limited amount of moisture, lasting only a few hours, will allow germination and root growth to deeper, subsurface moisture.

Likely sites for germination include vacant lots, agricultural fields, roadsides, fence lines, overgrazed rangelands, or any open site with loosened soil. Germination usually occurs in late fall or early spring, when the seed can take advantage of winter moisture. Seed viability is rapidly lost in the soil. Over 90% of the seed either germinate or decay in the soil during the first year.

In agricultural areas, Russian thistle can reduce yield and quality of numerous crops, particularly alfalfa and small grains. It depletes soil moisture, interferes with tillage and serves as shelter or food source to many insects, vertebrate pests, and crop diseases. Russian thistle can also threaten native plant ecosystems. It is very competitive when moisture is a limiting factor to the growth of other vegetation, when soils are disturbed, or when competing vegetation is suppressed due to overgrazing or poor crop establishment.

Russian thistle is not a state-listed noxious weed in Yakima or Kittitas Counties.

MANAGEMENT INFORMATION:

Cultural practices such as mowing or destroying young plants can prevent seed production. Burning is sometimes used to destroy accumulated Russian thistle plants. This may eliminate the accumulated organic debris and some seed, but much of the seed will already have been disseminated. Planting competitive, more desirable species can be an effective method of preventing Russian thistle establishment in most non-crop environments.

There are many herbicides that will control Russian thistle in agricultural crops and non-crop areas. On the Wenas Wildlife Area, some of the post-emergent herbicides that have been

successfully used on Russian thistle include Banvel or Vanquish (dicamba), Roundup (glyphosate) and 2,4-D. For best results, these herbicides must be applied while the weed is in its early growth stages, preferably the early seedling stage, before it becomes hardened and starts producing its spiny branches. If rain or irrigation occurs after a post-emergent application, additional seedlings may emerge and require future treatments.

CURRENT DISTRIBUTION ON THE SITE

Found throughout the Wenas Wildlife Area, at elevations generally below 4000 feet. Commonly found along roads and in degraded rangeland. There is a heavy infestation being controlled at the Roza flat restoration site (Roza Unit).

ACRES AFFECTED BY WEED: 1,000

WEED DENSITY: Low-medium

GOALS

Decrease occurrence of Russian thistle on the Wenas Wildlife Area.

Increase quality of infested plant communities.

OBJECTIVE

Survey and map existing Russian thistle populations.

More accurately calculate the acres affected by Russian thistle.

Reduce Russian thistle densities by using an integrated weed management approach.

Rehabilitate degraded areas with competitive native plants.

ACTIONS PLANNED

Continue Russian thistle control efforts by mowing, herbicide treatments and planting competitive vegetation.

Continue roadside spray program to reduce occurrence of Russian thistle along roads and parking areas.

CONTROL SUMMARY AND TREND

Roadsides on the Wildlife Area have been treated for weeds since 1997. Russian thistle occurs only sporadically along roads and in parking areas. Major infestations have occurred in the CRP fields on the Wildlife Area, but have been greatly reduced as the seeded perennial vegetation becomes established.

2002- Approximately 60 acres were treated.

2003- Approximately 90 acres were treated.

2004- Approximately 90 acres were treated.

2005- Approximately 80 acres were treated.

SCOTCH THISTLE CONTROL PLAN

Scientific name: *Onopordium acanthium*

Common name: Scotch Thistle

Updated: 2006

DESCRIPTION: Scotch thistle is an erect, biennial, and some times annual weed that grows up to 12 feet tall. Its large, coarsely lobed, hairy leaves have a velvety-gray appearance and are lined with sharp, conspicuous spines. The stems are branching, with spiny leaf wings extending down the stems from the leaves. Scotch thistle has purple to violet flowers and a large, fleshy taproot.

Scotch thistle is a biennial that produces a large, ground level rosette the first year and a tall, spiny plant the second. It reproduces only by seed, with one plant producing 70-100 flowering heads containing 100-140 seeds per seed head. Seeds may remain viable in the soil for over 30 years. Plumed seeds are dispersed by wind and by attaching to clothing and animal fur. Seeds may also be transported in hay and machinery, or be carried by wind and water.

Scotch thistle grows in sunny areas where soils have been disturbed and competition from other plants has been reduced. It is often found along roadsides, irrigation ditches, waste areas, and on rangelands. It is especially fond of areas that are adjacent to riparian or sub-irrigated deeper soils along stream courses, lower alluvial slopes and bottomlands. Once scotch thistle becomes established and forms a defined colony, it spreads by dominating other plants. Its large size and quick growth takes light, nutrient and water from other plants, while its rigid growth and spines protect the plant from grazing and trampling. Scotch thistle also contains a germination inhibitor that allows only a portion of its seeds to germinate each year while stopping other plant seeds from sprouting.

Scotch thistle is a state-listed class B-designate noxious weed in Yakima and Kittitas Counties. It is a fairly recent invader of Kittitas county and a high priority for control for both counties.

MANAGEMENT INFORMATION:

Scotch thistle is best controlled in the rosette stage. Its taproot can easily be severed with a shovel 1-2 inches below the ground. Control can be enhanced by a follow-up application of herbicides to surviving rosettes. An integrated approach to scotch thistle management involves 1) managing grazing to increase grass vigor and reduce ground disturbance; 2) spray rosettes with Tordon (picloram), Curtail (clopyralid), Escort (metsulfuron) or Weedmaster (2,4-D + dicamba); 3) follow-up with spot cutting of entire plants when the first flowers appear annually for several years to deplete the seed bank in the soil.

CURRENT DISTRIBUTION ON THE SITE

Scotch thistle is found on the South Umtanum Ridge Unit in the Buffalo area and in several drainages on the south side of Umtanum Ridge. Plants are present on neighboring lands and will continue to spread onto the wildlife area.

ACRES AFFECTED BY WEED: Approx. 25

WEED DENSITY: Low

GOALS

Decrease occurrence of Scotch thistle on the Wenas Wildlife Area.
Increase quality of infested plant communities.
Reduce spread of Scotch thistle from adjacent lands.

OBJECTIVES

Survey and map any existing Scotch thistle populations.
More accurately calculate the acres affected by Scotch thistle.
Control scotch thistle by using an integrated weed management approach.
Rehabilitate any degraded areas with competitive native plants.

ACTIONS PLANNED

Continue Scotch thistle control efforts using herbicide treatments and planting competitive vegetation.

CONTROL SUMMARY AND TREND

2002- Approximately 24 acres were treated.
2003- Approximately 23 acres were treated.
2004- Approximately 22 acres were treated.
2005- Approximately 25 acres were treated.

WHITE TOP (HOARY CRESS) CONTROL PLAN

Scientific name: *Cardaria draba* **Common name:** White top, hoary cress

Updated: 2006

DESCRIPTION: White top is an erect, perennial herb growing up to 2 feet tall. Flowers are small, white with numerous flower branches giving the plant a dense, white, flat-topped appearance. The plant reproduces by seed and an extensive creeping root system. Roots spread vertically and horizontally with frequent shoots arising from the rootstock. One plant can produce from 1,200 –4,800 seeds. Seeds can remain viable for three years in the soil. Plants emerge very early in the spring. Plants flower from May to June, and set seed by mid-summer. If conditions are favorable, a second crop of seeds can be produced in the fall.

White top is invading rangelands throughout North America. It is a highly competitive weed once it becomes established. In the absence of a competitor, a single plant can spread over an area of 12 feet in diameter in a single year. It spreads primarily by its extremely persistent roots and will eventually eliminate desirable vegetation and become a monoculture. White top is found on generally open, un-shaded disturbed ground. It grows well on alkaline soils that are wet in late spring and in areas with moderate amounts of rainfall. It is widespread in fields, waste places, meadows, pastures, croplands, and along roadsides.

MANAGEMENT INFORMATION:

Properly managed plant communities help resist white top invasion. Early infestations can be pulled or grubbed, however this plant will re-sprout from any remaining roots, making mechanical control difficult. Tillage is generally considered ineffective and usually contributes to the spread of the infestation by spreading the root fragments. Mowing will prevent seed production but does not kill the plant and the infestation will continue to spread through underground root systems. Chemicals such as Escort (metsulfuron) and Telar (chlorsulfuron) are very effective when applied from bud to flower stage and also in the fall. Due to its hairy leaf surface, a good surfactant is required. Seeding competitive, desirable native vegetation after control is required to help prevent reinvasion.

White top is a state-listed class C weed. In Kittitas County there has been a rapid increase of infestations in the last several years.

CURRENT DISTRIBUTION ON THE SITE

Found on the Wenas Wildlife Area at low to mid elevations in riparian zones, old agricultural fields, old homestead areas and roadsides, it has recently been spreading into shrub steppe habitat.

ACRES AFFECTED BY WEED: 300

WEED DENSITY: Low.

GOALS

Decrease occurrence of White top on the Wenas Wildlife Area.
Increase quality of infested plant communities.

OBJECTIVES

Survey and map existing populations.

More accurately calculate the acres affected by white top.

Reduce white top densities by chemical, cultural and biological methods.

Rehabilitate degraded areas with competitive native plants.

ACTIONS PLANNED

Continue chemical applications where appropriate.

Seed treated areas to promote competitive vegetation.

Research advances in biological control of white top.

CONTROL SUMMARY AND TREND

2002- Approximately 12 acres were treated.

2003- Approximately 30 acres were treated.

2004- Approximately 90 acres were treated.

2005- Approximately 70 acres were treated.

Whitetop populations have been somewhat reduced by herbicide treatments in some areas.

Infestations need continued work to keep them from spreading.

GENERAL WEEDS CONTROL PLAN

Scientific name: *Many*

Common name: General Weeds

Updated: 2005

DESCRIPTION: General weeds describe mixed vegetation that interferes with maintenance, agricultural, or restoration activities, where keying plants to individual species is not appropriate. Examples of general weeds may include vegetation occurring along roadsides, parking areas, trails, and structures and include species like cheatgrass, bulbous bluegrass, kochia, Russian thistle, etc. General weeds may also occur in agricultural fields, or comprise the dominant vegetation at a site identified for habitat restoration.

MANAGEMENT INFORMATION:

Herbicide can be an effective tool for control and applicators should refer to the PNW Weed Management Handbook, or other reputable resources, for product recommendations and timing depending on the weed and desired management objectives.

Mechanical weed control may include mowing, burning, to the plowing and disking entire fields.

CURRENT DISTRIBUTION ON THE SITE

All public accesses and roadsides on the wildlife areas contain general weeds to varying degrees.

ACRES AFFECTED BY WEED: ~600

WEED DENSITY: High

GOALS

Maintain public access
Restore agricultural fields
Reduce fire danger

OBJECTIVES

Treat high public use areas with residual herbicide to prevent seed production.
Summer fallow fields in second phase of restoration.
Maintain firebreaks

ACTIONS PLANNED

In 2006, problematic portions of roadsides, parking lots, access sites, and trailheads will be treated with a residual herbicide to eliminate the production and spread of weed seeds and improve appearance and public access for the entire season.

General weeds along roads used as firebreaks on the wildlife area will be maintained to keep fuels to a minimum, especially where our lands lie adjacent to populated areas.

CONTROL SUMMARY AND TREND

2002- Approximately 50 acres were treated.
2003- Approximately 100 acres were treated.
2004- Approximately 160 acres were treated.

2005- Approximately 240 acres were treated.

Roadside and access management have required a consistent, yearly maintenance effort. Increases in general weed management reflects the restoration work that has occurred in recent years on the Wenas Units.

Table 4. 2005 Kittitas County Noxious Weed List

For more information on a specific weed, please visit the Washington State Noxious Weed Board: <http://www.nwcb.wa.gov/>

Class A Noxious Weeds

| Common Name | Scientific Name |
|-------------------------|---------------------------------|
| Bean-caper, Syrian | <i>Zygophyllum fabago</i> |
| Blueweed, Texas | <i>Helianthus ciliaris</i> |
| Broom, Spanish | <i>Spartium junceum</i> |
| Buffalo bur | <i>Solanum rostratum</i> |
| Clary, meadow | <i>Salvia pratensis</i> |
| Cord grass, salt meadow | <i>Spartina patens</i> |
| Crupina, common | <i>Crupina vulgaris</i> |
| Dense flower cord grass | <i>Spartina densiflora</i> |
| Flax, spurge | <i>Thymelaea passerina</i> |
| Four o'clock, wild | <i>Mirabilis nyctaginea</i> |
| Goatsrue | <i>Galega officinalis</i> |
| Hawkweed, yellow devil | <i>Hieracium floribundum</i> |
| Hogweed, giant | <i>Heracleum mantegazzianum</i> |
| Hydrilla | <i>Hydrilla verticillata</i> |
| Johnsongrass | <i>Sorghum halepense</i> |
| Knapweed, bighead | <i>Centaurea macrocephala</i> |
| Knapweed, Vochin | <i>Centaurea nigrescens</i> |
| Kudzu | <i>Pueraria montana</i> |
| Lawnweed | <i>Solvia sessilis</i> |
| Mustard, garlic | <i>Alliaria petiolata</i> |
| Nightshade, silverleaf | <i>Solanum elaeagnifolium</i> |
| Sage, Clary | <i>Salvia sclarea</i> |
| Sage, Mediterranean | <i>Salvia aethiopis</i> |
| Spurge, eggleaf | <i>Euphorbia oblongata</i> |
| Starthistle, purple | <i>Centaurea calcitrapa</i> |
| Thistle, Italian | <i>Carduus pycnocephalus</i> |
| Thistle, milk | <i>Silybum marianum</i> |
| Thistle, slenderflower | <i>Carduus tenuiflorus</i> |
| Velvetleaf | <i>Abutilon theophrasti</i> |
| Woad, dyers | <i>Isatis tinctoria</i> |

Indicates those noxious weeds known to exist in Kittitas County. If you are aware of the existence of any noxious weeds in Kittitas County not highlighted in this list, please contact our office.

Class B Noxious Weeds

| Common Name | Scientific Name |
|-------------------------|-------------------------------|
| Alyssum, Hoary | <i>Bertero aincang</i> |
| Arrowhead, grass-leaved | <i>Sagittaria graminea</i> |
| Blackgrass | <i>Alopecurus myosuroides</i> |
| Blueweed | <i>Echium vulgare</i> |
| Broom, Scotch | <i>Cytisus scoparius</i> |
| Bryony, white | <i>Bryonia alba</i> |

| | |
|------------------------|----------------------------------|
| Bugloss, annual | <i>Anchusa arvensis</i> |
| Bugloss, common | <i>Anchusa officinalis</i> |
| Camelthorn | <i>Alhaga maurorum</i> |
| Carrot, wild | <i>Daucus carota</i> |
| Catsear, common | <i>Hypochaeris radicata</i> |
| Chervil, wild | <i>Anthriscus sylvestris</i> |
| Cinquefoil, sulfur | <i>Potentilla recta</i> |
| Cordgrass, common | <i>Spartina anglica</i> |
| Cordgrass, smooth | <i>Spartina alterniflora</i> |
| Daisy, oxeye | <i>Leucanthemum vulgare</i> |
| Elodea, Brazilian | <i>Egeria densa</i> |
| Fanwort | <i>Cabomba caroliniana</i> |
| Fieldcress, Austrian | <i>Rorripa austriaca</i> |
| Floating heart, Yellow | <i>Nymphoides peltata</i> |
| Gorse | <i>Ulex europaeus</i> |
| Hawkweed, mouseear | <i>Hieracium pilosella</i> |
| Hawkweed, orange | <i>Hieracium aurantiacum</i> |
| Hawkweed, polar | <i>Hieracium atratum</i> |
| Hawkweed, queendevil | <i>Hieracium glomeratum</i> |
| Hawkweed, smooth | <i>Hieracium laevigatum</i> |
| Hawkweed, yellow | <i>Hieracium caespitosum</i> |
| Hedge parsley | <i>Torillis arvensis</i> |
| Helmet, policeman's | <i>Impatiens glandulifera</i> |
| Herb-Robert | <i>Geranium robertianum</i> |
| Houndstongue | <i>Cynoglossum officinale</i> |
| Indigobush | <i>Amorpha fruticosa</i> |
| Knapweed, black | <i>Centaurea nigra</i> |
| Knapweed, brown | <i>Centaurea jacea</i> |
| Knapweed, diffuse | <i>Centaurea diffusa</i> |
| Knapweed, meadow | <i>Centaurea pratensis</i> |
| Knapweed, Russian | <i>Acroptilon repens</i> |
| Knapweed, spotted | <i>Centaurea maculosa</i> |
| Knotweed, Bohemian | <i>Polygonum bohemicum</i> |
| Knotweed, giant | <i>Polygonum sachalinense</i> |
| Knotweed, Himalayan | <i>Polygonum polystachyum</i> |
| Knotweed, Japanese | <i>Polygonum cuspidatum</i> |
| Kochia | <i>Kochia scoparia</i> |
| Lepyrodiclis | <i>Lepyrodiclis holosteoides</i> |
| Loosestrife, garden | <i>Lysimachia vulgaris</i> |
| Loosestrife, purple | <i>Lythrum salicaria</i> |
| Loosestrife, wand | <i>Lythrum virgatum</i> |
| Nutsedge, yellow | <i>Cyperus esculentus</i> |
| Oxtongue hawkweed | <i>Picris hieracioides</i> |
| Parrotfeather | <i>Myriophyllum aquaticum</i> |
| Pepperweed, perennial | <i>Lepidium latifolium</i> |
| Primrose, water | <i>Ludwigia hexapetala</i> |

| | |
|------------------------|--------------------------------|
| Puncturevine | <i>Tribulus terrestris</i> |
| Ragwort, Tansy | <i>Senecio jacobaea</i> |
| Saltcedar | <i>Tamarix ramosissima</i> |
| Sandbur, longspine | <i>Cenchrus longispinus</i> |
| Skeletonweed, rush | <i>Chondrilla juncea</i> |
| Sowthistle, perennial | <i>Sonchus arvensis</i> |
| Spurge, leafy | <i>Euphorbia esula</i> |
| Spurge, myrtle | <i>Euphorbia myrsinites</i> L. |
| Starthistle, yellow | <i>Centaurea solstitialis</i> |
| Swainsonpea | <i>Sphaerophysa salsula</i> |
| Thistle, musk | <i>Carduus nutans</i> |
| Thistle, plumeless | <i>Carduus acanthoides</i> |
| Thistle, Scotch | <i>Onopordum acanthium</i> |
| Toadflax, Dalmatian | <i>Linaria dalmatica</i> |
| Watermilfoil, Eurasian | <i>Myriophyllum spicatum</i> |

Class C Noxious Weeds

| Common Name | Scientific Name |
|------------------------------|------------------------------|
| Babysbreath | <i>Gypsophila paniculata</i> |
| Bindweed, field | <i>Convolvulus arvensis</i> |
| Cockle, white | <i>Silene latifolia</i> |
| Cocklebur, spiny | <i>Xanthium spinosum</i> |
| Cress, hoary | <i>Cardaria draba</i> |
| Dodder | <i>Cuscuta approximata</i> |
| Goatgrass, jointed | <i>Aegilops cylindrica</i> |
| Groundsel, common | <i>Senecio vulgaris</i> |
| Hawkweed, non-native species | <i>Hieracium</i> spp. |
| Henbane, black | <i>Hyoscyamus niger</i> |
| Iris, yellow flag | <i>Iris pseudocorus</i> |
| Mayweed, scentless | <i>Matricaria perforata</i> |
| Old man's beard | <i>Clematis vitalba</i> |
| Poison-hemlock | <i>Conium maculatum</i> |
| Reed, common, non-native | <i>Phragmites australis</i> |
| Spikeweed | <i>Hemizonia pungens</i> |
| St. Johnswort, common | <i>Hypericum perforatum</i> |
| Tansy, common | <i>Tanacetum vulgare</i> |
| Thistle, bull | <i>Cirsium vulgare</i> |
| Thistle, Canada | <i>Cirsium arvense</i> |
| Toadflax, yellow | <i>Linaria vulgaris</i> |
| Water lily, fragrant | <i>Nymphaea odorata</i> |
| Whitetop, hairy | <i>Cardaria pubescens</i> |
| Wormwood, absinth | <i>Artemisia absinthium</i> |

Table 5. Yakima County Weed list

2005

**YAKIMA COUNTY NOXIOUS WEED
LIST AND CONTROL POLICY**

The YAKIMA COUNTY NOXIOUS WEED BOARD (here in after referred to as the BOARD) shall promote weed control by personal contact with LANDOWNERS and through public media. The BOARD will also promote weed control through public seminars, hearings, demonstrations, field tours, school lectures, and at regularly scheduled board meetings. LANDOWNERS are responsible for the control of noxious weeds on their property as per RCW 17.10.140 prior to blooming stage, seed maturity and the development of a root system that would enable said weeds to propagate and spread.

The BOARD shall encourage landowners to control noxious weeds on their own property through their own means, or by means commercially available. Control is defined as stopping all seed production, and containing the noxious weeds to the current infested locations. The Weed Board Coordinator and Inspectors will assist landowners in locating and identifying noxious weeds and encourage the landowner to report to the BOARD other noxious weed infestations. The BOARD, or AUTHORIZED STAFF, has the authority to enter all property within the jurisdiction of this BOARD for the purpose of administering the weed laws of the State of Washington under R.C.W. Chapter 17.10.160.

If the property owner does not promptly take action to control the noxious weeds in accordance with R.C.W. 17.10 and this policy, the YAKIMA COUNTY NOXIOUS WEED BOARD may cause their being controlled at the expense of the landowner as per R.C.W. 17.10.170. Charges for regulatory work shall be incurred by the landowner on the basis of the cost, including labor and materials and, if necessary, legal and administrative fees. Such expenses when necessary shall constitute a lien against the property after a hearing and determination has been made on such expense and approved by the BOARD.

The W.A.C. Chapter 16.750 constitutes the Washington State Noxious Weed List, which is classified as “A”, “B”, and “C” weeds. The following shall constitute Yakima County’s Noxious Weed List and control is required within Yakima County.

All Class “A” Weeds,
Class “B” Weeds, (All designated, some listed)
Yellow Starthistle-*Centaurea solstitialis*
Tansy ragwort-*Senecio jacobaea*
Scotch thistle-*Onoprodum acanthium*
Meadow knapweed-*Centaurea pratensis*
Yellow nutsedge-*Cyperus esculentus*
Purple loosestrife-*Lythrum salicaria*

Educational Weed List
Knapweed species-All known species
Canada thistle-*Cirsium arvense*
Perennial pepperweed-*Lepidium latifolium*

The Yakima County Noxious Weed Board will conduct regularly scheduled meetings and will encourage public attendance and participation.

Resolution: #55 The following requirements will be the policy for placing a weed on the County’s Noxious Weed List:

- A. The Weed Board shall announce the noxious weed list within the guidelines set forth in R.C.W. 17.10.090.

- B. The order in which a weed be submitted to the Board for consideration to be placed on the noxious weed list, the following information must be submitted to the Noxious Weed Board.
1. Location of weed, with an estimation of acreage.
 2. Verification that adjacent property owners have been notified on the intent to have the weed placed on the Noxious Weed List.
 3. Characteristics of the weed in consideration.
- C. The Weed Board has the right to place the weed in question on a review and study list for a set period of time not to exceed one year and, at that time, make a policy statement on the weed in question.

RESOLUTION #118

YAKIMA COUNTY NOXIOUS WEED LIST FOR 2005

In accordance with R.C.W. 17.10 a County Noxious Weed List comprising the names of the following plants, which have been declared noxious by the State of Washington Noxious Weed Board, and Yakima County Weed Control Board. Said Board find these plants to be weedy; highly destructive, competitive, or difficult to control by cultural or chemical practices. Said weeds shall comprise the NOXIOUS WEED LIST for Yakima County for 2005 or until another list is adopted by this Board.

Yakima County lies in Regions 6 and 9.

Table 4. Yakima County Noxious Weed List

ALL CLASS “A” NOXIOUS WEEDS. (Mandatory Control)
 (** Known to be in Yakima County)

| | | | |
|------------------------|-------------------------------------|------------------------|-----------------------------|
| COMMON NAME: | SCIENTIFIC NAME: | thistle, milk | <i>Silybum marianum</i> |
| bean-caper, Syrian | <i>Zygophyllum fabago</i> | thistle, slenderflower | <i>Carduus tenuiflorus</i> |
| blueweed, Texas ** | <i>Helianthus ciliaris</i> | velvetleaf ** | <i>Abutilon theophrasti</i> |
| broom, Spanish | <i>Spartium junceum</i> | woad, dyers | <i>Isatis tinctoria</i> |
| buffalobur ** | <i>Solanum rostratum</i> | | |
| clary, meadow | <i>Salvia pratensis</i> | | |
| cordgrass, denseflower | <i>Spartina densiflora</i> | | |
| cordgrass, salt meadow | <i>Spartina patens</i> | | |
| crupina, common | <i>Crupina vulgaris</i> | | |
| flax, spurge | <i>Thymelaea passerina</i> | | |
| four o'clock, wild | <i>Mirabilis nyctaginea</i> | | |
| goatsrue | <i>Galega officinalis</i> | | |
| hawkweed, yellow devil | <i>Hieracium floribundum</i> | | |
| hogweed, giant | <i>Heracleum mantegazzianum</i> | | |
| hydrilla | <i>Hydrilla verticillata</i> | | |
| johnsongrass ** | <i>Sorghum halepense</i> | | |
| COMMON NAME: | SCIENTIFIC NAME: | | |
| knapweed, bighead | <i>Centaurea macrocephala</i> | | |
| knapweed, Vochin | <i>Centaurea nigrescens</i> | | |
| kudzu | <i>Pueraria Montana var. lobata</i> | | |
| lawnweed | <i>Soliva sessilis</i> | | |
| mustard, garlic | <i>Alliaria petiolata</i> | | |
| nightshade, silverleaf | <i>Solanum elaeagnifolium</i> | | |
| sage, clary | <i>Salvia sclarea</i> | | |
| sage, Mediterranean | <i>Salvia aethiopis</i> | | |
| spurge, eggleaf | <i>Euphorbia oblongata</i> | | |
| starthistle, purple | <i>Centaurea calcitrapa</i> | | |
| thistle, Italian | <i>Carduus pycnocephalus</i> | | |

CLASS “B” NOXIOUS WEEDS (**Known to be in Yakima County)
 (bd classifications require mandatory control) Note: bd - Class B designate

| COMMON NAME: | SCIENTIFIC NAME: |
|---------------------------|---|
| arrowhead, grass-leavedbd | <i>Sagittaria graminea</i> |
| alyssum, hoary bd | <i>Berteroa incana</i> |
| blackgrass bd | <i>Alopecurus myosuroides</i> |
| blueweed bd | <i>Echium vulgare</i> |
| broom, Scotch bd** | <i>Cytisus scoparius</i> |
| bryony, white bd | <i>Bryonia alba</i> |
| bugloss, annual bd | <i>Anchusa arvensis</i> |
| bugloss, common bd | <i>Anchusa officinalis</i> |
| camelthorn bd | <i>Alhagi maurorum</i> |
| carrot, wild bd** | <i>Daucus carota</i> |
| catsear, common bd ** | <i>Hypochaeris radicata</i> |
| chervil, wild bd | <i>Anthriscus sylvestris</i> |
| cinquefoil, sulfur bd | <i>Potentilla recta</i> |
| cordgrass, common bd | <i>Spartina alterniflora</i> |
| COMMON NAME: | SCIENTIFIC NAME: |
| cordgrass, smooth bd | <i>Spartina anglica</i> |
| daisy, oxeye bd** | <i>Leucanthemum vulgare</i> |
| elodea, Brazilian bd | <i>Egeria densa</i> |
| fanwort bd | <i>Cabomba caroliniana</i> |
| fieldcress, Austrian bd | <i>Rorippa austriaca</i> |
| floating heart, yellow bd | <i>Nymphoides peltata</i> |
| gorse bd | <i>Ulex europaeus</i> |
| hawkweed, mouseear bd | <i>Hieracium pilosella</i> |
| hawkweed, orange bd | <i>Hieracium aurantiacum</i> |
| hawkweed, polar bd | <i>Hieracium atratu</i> |
| hawkweed, Queen-devil bd | <i>Hieracium glomeratum</i> |
| hawkweed, smooth bd | <i>Hieracium laevigatum</i> |
| hawkweed, yellow bd | <i>Hieracium caespitosum</i> |
| hedgearsley bd | <i>Torilis arvensis</i> |
| helmet, policeman’s bd | <i>Impatiens glandulifera</i> |
| herb-Robert bd | <i>Geranium robertianum</i> |
| houndstongue** | <i>Cynoglossum officinale</i> |
| indigobush bd | <i>Amorpha fruticosa</i> |
| knapweed, black bd | <i>Centaurea nigra</i> |
| knapweed, brown bd | <i>Centaurea jacea</i> |
| knapweed, diffuse ** | <i>Centaurea diffusa</i> |
| knapweed, meadow bd** | <i>Centaurea jacea x nigra</i> |
| knapweed, Russian ** | <i>Acroptilon repens</i> |
| knapweed, spotted bd** | <i>Centaurea biebersteinii</i> |
| knotweed, Bohemian | <i>Polygonum bohemicum</i> |
| knotweed, giant | <i>Polygonum sachalinense</i> |
| knotweed, Himalayan | <i>Polygonum polystachyum</i> |
| kochia** | <i>Kochia scoparia</i> |
| lepyrodiclis bd | <i>Lepyrodiclis holosteoides</i> |
| loosestrife, garden bd | <i>Lythrum salicaria</i> |
| loosestrife, purple bd** | <i>Lythrum virgatum</i> |
| loosestrife, wand bd | <i>Lythrum virgatum</i> |
| nutsedge, yellow ** | <i>Cyperus esculentus</i> |
| oxtonge, hawkweed bd | <i>Picris hieracioides</i> |
| parrotfeather bd** | <i>Myriophyllum aquaticum</i> |
| pepperweed, perennial ** | <i>Lepidium latifolium</i> |
| primrose, water | <i>Ludwigia hexapetala</i> |
| | knotweed, Japanese ** <i>Polygonum cuspidatum</i> |

| | |
|-----------------------------|-------------------------------|
| puncturevine** | <i>Tribulus terrestris</i> |
| ragwort, tansy bd** | <i>Senecio jacobaea</i> |
| saltcedar bd | <i>Tamariz ramosissima</i> |
| sandbur, longspine | <i>Cenchrus longispinus</i> |
| skeletonweed, rush bd** | <i>Chondrilla juncea</i> |
| sowthistle, perennial bd** | <i>Sonchus arvensis</i> |
| spurge, leafy bd** | <i>Euphorbia esula</i> |
| spurge, Myrtle** | <i>Euphorbia myrsinites</i> |
| starthistle, yellow bd** | <i>Centaurea solstitialis</i> |
| swainsonpea** | <i>Sphaerophysa salsula</i> |
| thistle, musk bd** | <i>Carduus nutans</i> |
| thistle, plumeless bd | <i>Carduus acanthoides</i> |
| thistle, Scotch bd** | <i>Onopordum acanthoides</i> |
| toadflax, Dalmatian ** | <i>Linaria dalmatica</i> |
| watermilfoil, Eurasian bd** | <i>Myriophyllum spicatum</i> |

Class “C” Noxious Weeds

| COMMON NAME: | SCIENTIFIC NAME: |
|----------------------------|---------------------------------|
| babysbreath | <i>Gypsophila paniculata</i> |
| bindweed, field | <i>Convolvulus arvensis</i> |
| butterfly bush | <i>Buddleja davidii</i> |
| canarygrass, reed | <i>Phalaris arundinacea</i> |
| cockle, white | <i>Silene latifolia</i> |
| cocklebur, spiny | <i>Xanthium spinosum</i> |
| cress, hoary | <i>Cardaria draba</i> |
| dodder, smoothseed alfalfa | <i>Cuscuta approximata</i> |
| goatgrass, jointed | <i>Aegilops cylindrica</i> |
| groundsel, common | <i>Senecio vulgaris</i> |
| hawkweed, spp* | non-native <i>Hieracium</i> |
| henbane, black | <i>Hyoscyamus niger</i> |
| iris, yellow flag | <i>Iris pseudocorus</i> |
| ivy, English | <i>Herdera Hibernica</i> |
| ivy, English | <i>Hedera helix, Baltica</i> |
| ivy, English | <i>Hedera helix, Pittsburgh</i> |
| ivy, English | <i>Hedera helix, Star</i> |
| COMMON NAME: | SCIENTIFIC NAME: |
| mayweed, scentless | <i>Matricaria perforata</i> |
| old man’s beard | <i>Clematis vitalba</i> |
| pondweed, curly-leaf | <i>Potamogeton crispus</i> |
| poison-hemlock | <i>Conium maculatum</i> |
| reed, common | <i>Phragmites australis</i> |
| rye, cereal | <i>Secale cereale</i> |

APPENDIX 3: FIRE MANAGEMENT PLAN

Responsible Fire-Suppression Entities: The North Cleman Mountain Unit of the Wenas Wildlife Area contains the majority of the forested habitats found on the wildlife area. Ponderosa pine, Douglas fir, grand fir, western larch and other species make up the forest types on the Wildlife Area. This portion of the Wildlife Area is within the State Fire Protection Boundary and wildfire suppression activities within this boundary are under the jurisdiction of DNR. WDFW pays a timber tax assessment fee for each acre within the fire protection boundary for these services.

The remainder of the wildlife area is non-forested, grassland and shrub-steppe lands that are included in a fire suppression contract between the Washington Department of Fish and Wildlife and the Washington Department of Natural Resources. This contract provides for rapid air and ground response to wildfires on the non-forested areas on the Wenas Wildlife Area. The Selah Volunteer Fire Department also provides assistance with fighting fires on the Wenas Wildlife Area.

Department Fire Management Policy: It is the Departments policy that wildlife area staffs are not firefighters and should not fight fires. Wildlife Area staff are trained in fire fighting and fire behavior, however, staff will only provide logistical support and information regarding critical habitat values to the Incident Commander of the responding fire entity.

Wildlife Habitat Concerns: The Wildlife Area contains fire sensitive habitats that are critical to the survival of certain wildlife species. Shrub-steppe habitats can be degraded with the loss of species such as big sagebrush and antelope bitterbrush. Shrub-steppe obligate (dependant) wildlife species such as the sage grouse may be directly affected by large scale, uncontrolled fires. The loss of important browse plants for big game species such as mule deer can dramatically reduce the quality of their winter range. Due to these concerns, WDFW requests that the Incident Commander or other fire fighting personnel on site notify WDFW personnel immediately in the order listed below. A WDFW Advisor will provide information to the Incident Commander regarding habitat concerns.

Aerial Support: The WDFW recommends that fire-fighting entities suppress fires on the Wildlife Area as rapidly as possible. WDFW requests the Incident Commander to seek aerial support if needed to extinguish a fire on its land promptly. If, in the professional judgment of the Incident Commander, a fire on lands adjacent to one of the Wildlife Area causes an immediate threat to the area, WDFW requests that he/she seeks aerial support as possible.

Reporting: Report any fire on or adjacent to the Wenas Wildlife Area to the local fire district, DNR, or WDFW (see local contact numbers below). The Central Washington Interagency Command Center (CWICC) coordinates all fire responses in this area and they will dispatch the appropriate fire-fighting entity. It is absolutely critical that any fire on the area is attacked as aggressively as possible during the initial attack. The importance of aerial support cannot be overstated.

**Table 5. Fire Contacts.
Fire Districts – DIAL 911**

| NAME | TELEPHONE |
|----------------------------------|--------------|
| Kittitas County Dispatch | 509-925-8534 |
| Kittitas County Fire District #4 | 509-856-2888 |

DNR- contact in order listed and request Operations or Staff Coordinator

| NAME | TELEPHONE |
|----------------------|--------------|
| DNR Dispatch (CWICC) | 509-884-3473 |

The following table provides telephone numbers in priority order of Department staff to be contacted in the event of a fire.

Table 6. Fire Contacts Fire Districts – DIAL 911

| Contact | Contact Number | |
|--------------------------------------|----------------|--------|
| Cindi Confer, Wildlife Area Manager | 509-925-6746 | Work # |
| Jody Taylor, W.A. Assistant Manager | 509-697-4503 | Work # |
| Wayne Hunt, W.A. Bio 2 | 509-925-6746 | Work # |
| Regional Office – Yakima | 509-575-2470 | |
| Regional Program Manager – Ted Claus | 509-457-9313 | Work # |

APPENDIX 4: WATER RIGHTS

Table 7. Wenas Wildlife Area Water Rights

| File # | D | Priority | Pur | | Irrig | W | Co | TRS | Q | |
|---------------|--------|------------|------------|----|-------|------|------|-----|----------|----------------|
| G4-27830BWRIS | Permit | 02/08/1982 | DS,IR,ST | | GPM | 85.9 | 19.5 | 39 | Yakima | 14.0N 19.0E 07 |
| S4-099337CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 15.0N 16.0E 03 |
| S4-099339CL | A | Claim L | No ID | | CFS | | | 38 | Yakima | 15.0N 16.0E 10 |
| S4-099345CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 15.0N 16.0E 10 |
| S4-099338CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 15.0N 16.0E 13 |
| S4-099350CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 15.0N 17.0E 12 |
| S4-27588 | A | NewApp | 08/10/1981 | DM | CFS | | | 39 | Yakima | 15.0N 17.0E 15 |
| S4-099340CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 15.0N 17.0E 17 |
| S4-093183CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 15.0N 18.0E 01 |
| S4-093184CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 15.0N 18.0E 02 |
| S4-099381CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 15.0N 18.0E 05 |
| S4-098534CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 15.0N 18.0E 12 |
| S4-093179CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 15.0N 18.0E 13 |
| S4-093186CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 15.0N 18.0E 13 |
| S4-094324CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 15.0N 18.0E 15 |
| S4-093176CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 15.0N 18.0E 22 |
| G4-094335CL | A | Claim L | ST,DG | | GPM | | | 39 | Yakima | 15.0N 18.0E 34 |
| S4-093182CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 06 |
| S4-120686CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 07 |
| S4-093180CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 07 |
| S4-093181CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 07 |
| S4-094325CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 17 |
| S4-093177CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 18 |
| S4-093178CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 18 |
| S4-093175CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 19 |
| S4-093174CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 20 |
| S4-099336CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 20 |
| S4-093172CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 30 |
| S4-093173CL | A | Claim L | ST | | CFS | | | 39 | Kittitas | 15.0N 19.0E 31 |
| G4-099382CL | A | Claim L | DG | | GPM | | | 39 | Yakima | 16.0N 16.0E 13 |
| G4-099383CL | A | Claim L | DG | | GPM | | | 39 | Yakima | 16.0N 16.0E 24 |
| S4-099347CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 16.0N 16.0E 25 |
| S4-099341CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 16.0N 16.0E 31 |
| S4-094358CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 01 |
| S4-099351CL | A | Claim L | No ID | | CFS | | | 38 | Yakima | 16.0N 17.0E 06 |
| S4-099352CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 07 |
| S4-099353CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 08 |
| S4-099354CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 08 |
| S4-099355CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 08 |
| S4-099356CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 08 |
| S4-099357CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 08 |
| S4-099358CL | A | Claim L | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 09 |
| S4-093617CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 11 |
| S4-093618CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 11 |
| S4-093612CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 12 |
| S4-094355CL | A | Claim L | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 13 |

| | | | | | | | | | | | | |
|----------------|---|----------|------------|-------|--|-----|------|------|----|----------|----------------|-------|
| S4-093614CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 14 | |
| S4-094356CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 14 | |
| S4-094357CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 14 | |
| S4-099359CL | A | Claim L | | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 15 | |
| S4-099379CL | A | Claim L | | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 15 | |
| S4-099360CL | A | Claim L | | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 16 | |
| S4-099361CL | A | Claim L | | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 16 | |
| S4-099362CL | A | Claim L | | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 16 | |
| S4-099363CL | A | Claim L | | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 17 | |
| S4-099364CL | A | Claim L | | No ID | | CFS | | | 39 | Yakima | 16.0N 17.0E 17 | |
| S4-099365CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 17 | |
| S4-27544 | A | NewApp | 6/26/81 | WL,ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 17 | |
| S4-099366CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 19 | |
| S4-27541 | A | NewApp | 6/26/81 | WL,ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 20 | |
| S4-27542AWRIS | I | NewApp | 6/26/81 | WL,ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 20 | |
| S4-099367CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 21 | |
| S4-099368CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 22 | |
| S4-099369CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 22 | |
| S4-099370CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 23 | |
| S4-099371CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 24 | |
| S4-099372CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 24 | |
| S4-099376CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 24 | |
| S4-099380CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 25 | |
| S4-099378CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 26 | |
| S4-099375CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 17.0E 28 | |
| S4-099384CL | A | Claim L | | ST,IR | | CFS | | | 39 | Yakima | 16.0N 17.0E 28 | |
| G4-30247 | A | Permit | 5/1/90 | WL | | GPM | 18.0 | | 39 | Yakima | 16.0N 17.0E 28 | |
| S4-048140CL | A | Claim S | | DG | | CFS | | | 39 | Yakima | 16.0N 17.0E 29 | |
| S4-29172AWRIS | I | NewApp | 1/6/87 | FS | | CFS | | | 39 | Yakima | 16.0N 17.0E 29 | |
| S4-*03025JWRIS | A | Ad jCert | 01/01/2004 | IR | | CFS | | 7.65 | 39 | Yakima | 16.0N 17.0E 31 | SE/NE |
| S4-137907CL | A | Claim L | | IR | | | | 20.0 | 39 | Yakima | 16.0N 17.0E 31 | |
| G4-048146CL | A | Claim S | | DG | | GPM | | | 39 | Yakima | 16.0N 17.0E 33 | |
| S4-095632CL | A | Claim L | | ST | | | | | 39 | Kittitas | 16.0N 18.0E 01 | |
| S4-093616CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 09 | |
| S4-093615CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 10 | |
| S4-098533CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 14 | |
| S4-094352CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 15 | |
| S4-094353CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 15 | |
| S4-094354CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 18 | |
| S4-094351CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 19 | |
| S4-094350CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 20 | |
| S4-099377CL | A | Claim L | 05/17/1974 | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 20 | |
| S4-094347CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 21 | |
| S4-094348CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 21 | |
| S4-094349CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 21 | |
| S4-094343CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 22 | |
| S4-094344CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 22 | |
| S4-094345CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 22 | |
| S4-094346CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 22 | |
| S4-094341CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 23 | |
| S4-094342CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 23 | |
| S4-094330CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 25 | |

| | | | | | | | | | | | | |
|-------------|---|---------|--|----|--|-----|--|--|----|----------|----------------|--|
| S4-094331CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 25 | |
| S4-094332CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 25 | |
| S4-094333CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 25 | |
| S4-094334CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 26 | |
| S4-094337CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 27 | |
| S4-094338CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 27 | |
| S4-094339CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 27 | |
| S4-094340CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 29 | |
| S4-099373CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 18.0E 31 | |
| S4-099374CL | A | Claim L | | ST | | CFS | | | 39 | Yakima | 16.0N 18.0E 31 | |
| S4-094328CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 33 | |
| S4-094327CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 34 | |
| S4-093185CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 18.0E 35 | |
| S4-094329CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 16.0N 19.0E 30 | |
| S4-094361CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 17.0N 17.0E 23 | |
| S4-098531CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 17.0N 17.0E 23 | |
| S4-094359CL | A | Claim L | | ST | | CFS | | | 39 | Kittitas | 17.0N 18.0E 19 | |

APPENDIX 5: MANAGEMENT PLAN COMMENTS & RESPONSES

Washington State Department of Fish and Wildlife, February 2007

The following individuals commented during the management plans public comment period.

| Comment Author | Organization | Location |
|------------------------|---------------------------------|----------|
| Bill White | LMAC | Easton |
| Norm Peck | | |
| Chris Sato & Dave Hays | WDFW Wildlife Diversity Section | Olympia |

Abbreviations: USFWS-United States Fish and Wildlife Services, etc.

Comments received on the Wenas Wildlife Area Plan are presented below. A response for each comment is included. Where appropriate, changes were incorporated into the management plan to address public comments.

| Commenter | Comment | Response |
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| | General Support | |
| Norm Peck | I concur with the need for seasonal closures, especially in the late winter and spring, both to avoid disturbance of wintering wildlife, and to minimize road damage during this damage-prone time between snow-melt and drying sufficiently to support traffic with minimal road damage and rutting/erosion/siltation. | Thank you for your support. |
| | Hunting/Fishing | |
| | Fish, Wildlife and Habitat | |
| Bill White | It appears that all of the recommendations from the CAG suggesting using cattle grazing as a tool were completely ignored in preparing this plan. In fact the plan even plans to remove some cattle fencing and cross fencing. I'm questioning the purpose of having a Citizens Advisory Committee if the managers are not at least open minded on suggestions. Cattle grazing is an excellent management tool to improve elk habitat. Two recent reports written by Doug Warnock cited some good science to prove it. (Capital Press, June 2, 2006 and Capital Press Nov 10, 2006). | Citizens Advisory Committees are meant to provide advice on management of the Wildlife Area. Not all recommendations are implemented. Currently management is aimed at shrub-steppe enhancements funded under BPA mitigation for inundation of Columbia River dams. Although livestock grazing may be considered there are no current proposals to implement grazing as an enhancement measure. Although elk are an important species on the Wildlife Area they are not a management emphasis for BPA funding. |

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| | <p>I also question the purpose of re-establishing native plants in some areas when the adjoining private lands have many non-native species that the elk seem to prefer. If we eliminate the desirable plants elk prefer and eliminate cattle to eat the tough stem grasses in the fall, then we are actually pushing the elk to the private land. Hopefully, these issues can be rethought.</p> | <p>The Wenas Wildlife Area is managed for multiple species, one of which is elk. Emphasizing native shrub-steppe ecosystem restoration benefits all native wildlife species dependent on shrub-steppe habitat, rather than focusing habitat management on a single species, which can be detrimental to other species. Elk have evolved and flourished in native shrub-steppe habitat and these native plant species are desired by elk. In addition, elk fence limits elk from moving onto private lands in the Wenas Valley.</p> |
| <p>Norm Peck</p> | <p>Upland birds: redevelopment and maintenance of historic springs east of Hanson Pond Road (e.g. “The Pines”, the meadow southeast of the intersection of Melligard Canyon and Hanson Pond Road, etc.) has the potential to improve Hun and quail habitat suitability in that area, and possibly enhance turkey habitat as well. The incremental increase in maintenance cost would be relatively low if maintenance co-occurred with maintenance of the Melligard Property Springs.</p> | <p>Management is focused on specific native species that are funded under BPA mitigation. When funding becomes available for non-native species management, spring re-development will be considered.</p> |
| | <p>ESA Compliance, 2 B & C: it should be recognized that road abandonment is not the only viable approach to controlling sediment in streams; it is merely the cheapest and easiest. Properly placed bridges, open-bottom culverts or hard-bottom crossings, coupled with quarry-spill or paved access to crossings are (with use of drain-ways upgradient) are also proven to reduce or eliminate sedimentation rates above natural rates. Far more adverse sedimentation occurs in “normal” agricultural tillage areas (10-30 tons/acre/year in some instances) than from even poorly maintained roads.</p> | <p>Current funding precludes many of these approaches. Road abandonment is the most viable and cost effective option available. In addition to reducing sediment delivery removing stream adjacent roads from riparian areas allows for enhanced riparian habitat which is beneficial to fish and wildlife. Stream crossings are being upgraded where needed on roads that are not stream adjacent parallel.</p> |

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| | Where resources are limited, the selected strategy for protecting and enhancing ESA species should prioritize: 1.) known presence; 2.) documented or known historic habitat and, last, and if the first two have not resulted in population rebound, 3.) potential habitat with no known history or knowledge of species use. | We think you are referring to ESA species. ESA regulations require consultation with USFWS and NMFS in determining recovery efforts. |
| | Provide fire management strategies, 3C&D; Incident Command Structure (and if possible drills) should be agreed to prior to an incident, as part of the contract negotiations of follow-up. | WDFW contracts with DNR for response to wild land fires. They are responsible for incident command structure and managing the fire. WDFW personnel are on site liaison identifying habitat priorities for protection. |
| | Reconnect with those interested in Washington’s Fish and Wildlife: those same visitors you seek to educate (a valuable function) also have knowledge of the areas you manage that can enhance your own: tapping into that, as well as carrying “bad news” to them about closures and restrictions (perceived or real) should be emphasized; this could result in more volunteers. | Thank you for your comment. We encourage public comments and assistance in managing the Wildlife Area. |
| | 8B: protect and manage other species: maintaining established foot-paths will allow access to these areas, while minimizing disruption; that which cannot be appreciated will not be valued. People must be able to see and appreciate these areas to sustain sufficient public interest to justify the programs’ ongoing funding. | Closed roads provide foot path access on many of the areas. The Skyline, Umtanun Falls, and Umtanum Creek Trails all provide a more formal foot access to areas of the wildlife area. |
| | 8C: protect and manage other species, recognize that restrictions protection these areas may be seasonal, and not necessarily year-round. | The majority of our closures are seasonal and all are based on the needs of the species. |
| | Impact of target shooting: About 5 years ago or so, there was a volunteer effort to clean up two Durr Road “informal shooting by a local Ellensburg group. I think there is sufficient interest to support regular cleanup-days. That said, I don’t like to see glass targets, old computers and abandoned vehicles, drinking while shooting, etc. that | We agree strongly. We have annual cleanups on both ends of the Durr Road organized by the Kittitas Field and Stream Club on the north and Wenas Muzzleloaders on the south. |

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| | are (too) often occurring, not to mention unsafe practices such as shooting over back tops (or without), etc. Nonetheless, my ability as a hunter is enhanced by the ability to chronograph loads, target ranges to 400 yds. (with a safe backstop) and generally practice as needed to maintain proficiency; these are important to me, and are part of being an ethical hunter, i.e. knowing the abilities and limitation of myself and my equipment. | |
| | J Structures and Physical Improvements: consider, as possible and resources permit, replacing barbed-wire fence gates with cattle guards for all-around improved relations with users and adjacent owners. | The Wenas Wildlife Area does not have any barbed wire fence gates that this would apply to. |
| | Issue B: Recreation Access: target shooting: note that it is unsafe (physically or environmentally) practices, not necessarily target shooting per se over which control is sought. See previous comment. The actual issue is controlling irresponsible target shooting, if possible, short of an absolute prohibition (virtually unenforceable in areas where hunting is allowed, within resource limitations). | This issue is currently under review. Comment is noted. |
| | Winter Range Protection: Kansas Dept. of Parks and Wildlife has established "ORV" use areas specifically to provide ATV (and even mudders) opportunities to ply their hobby...in a limited area (in the case I'm aware of, in a closed drainage basin), and aggressively enforces violations in other areas. | Thank you for your comment. |
| Chris Sato & Hays | The following recommendations concerning state-listed and candidate species are suggested for the L.T. Murray Wildlife Area Plan. We recommend that you discuss each Species of Concern (or at & E species), its needs, and specific objectives and actions for conservation and recovery on the Wildlife Area. Refer to recovery plans for actions. Species without plans should also be addressed. Construct paragraphs for these species in the same detail as used for big game, fish, etc. When discussing actions relating to surveys, | The Wenas W.A. Plan was reviewed and species accounts have been added. |

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| | habitat and site protection, please specifically list SOC (minimum T &E species) that would be benefited by these actions, rather than general taxa. The Columbia Basin Wildlife Action Plan provides a good example of how state species of concern and their issues should be addressed. Thank you for the opportunity to comment on the state Wildlife Area Plans. | |
| | Land Acquisition | |
| | Enforcement | |
| | Weeds | |
| Norm Peck | Issue A: Weed Management: use of non-native species as step in restoring disturbed areas should be carefully evaluated, and priority should be given to non-fertile, annual species where practicable to enhance opportunities for native species to take over as easily/soon as possible. | WDFW has had the best success with seeding directly with native species. |
| | Note: While fire is one disturbance, logging is another, and one that may affect more acreage most years. Native vegetation restoration should be a consideration in any logging/thinning contracts let on WDFW lands. | We agree and WDFW contracts on the Wildlife Area are already written in this manner. |
| | Funding | |
| | Partnerships | |

REFERENCES

- Anderson, R.J. and A.M. Bruce. 1980. A comparison of selected bald and golden eagle nests in western Washington. Pp.117-120 in R.L. Knight, ed., Proceedings of the Washington Bald Eagle Symposium, Seattle.
- Bernatowicz, J. 2003. Bighorn Sheep Status and Trend Report: Region 3. In Big Game Status Report. Washington Dept. of Fish and Wildlife, Olympia, WA.
- Bernatowicz, J. 2005. Washington State Elk Herd Plan, Draft Colockum Elk Herd. Washington Dept. of Fish and Wildlife, Olympia, WA.
- Bracken, E. and J.L. Musser 1993. Colockum Elk Study. Wash. Dept. of Fish and Wildlife. Fed. Aid Wildl. Restor. Rep. Reoj. 129pp.

- Braun, C.E., M.F. Baker, R.L. Eng, J.S. Gashwiler, and M.H. Schroeder. 1976. Conservation committee report on effects of alteration of sagebrush communities on the associated avifauna. *Wilson Bull.* 88:165-171.
- Bryant, L.D. and C. Maser. 1982. Classification and distribution. Pages 1-60 *in* J.W. Thomas and D.E. Toweill eds., *Elk of North America: ecology and management*. Stackpole Books, Harrisburg, Pennsylvania, USA.
- Buchanan, J.B., R.E. Rogers, J.D. Pierce and J.E. Jacobson. Washington Department of Fish and Wildlife, 600 Capitol Way North, Olympia, Washington 98501 USA
- Bull, Evelyn L. and Jerome A. Jackson. 1995. Pileated Woodpecker (*Dryocopus pileatus*), *The Birds of North America Online* (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:
<http://bna.birds.cornell.edu/bna.html/species/148>
- Cade, B.S. and R.W. Hoffman. 1990. Winter use of Douglas fir forests by blue grouse in Colorado. *J. Wildl. Manage.* 54(3):471-478.
- Chappell, C.B. 2001 *Wildlife habitats: In Johnson and O'Neil. 2001. Wildlife Habitat Relationships in Oregon and Washington*. Oregon State University Press. Corvallis Oregon USA.
- Christensen, G. C. 1996. Chukar (*Alectoris chukar*). No. 258 *in* A. Poole and F. Gill eds. *The Birds of North America*. The Academy of Natural Sciences, Philadelphia, PA. And The American Ornithologists' Union, Washington D.C..
- Dixon, S.L. and R.L. Lyman. 1996. On the Holocene history of elk (*Cervus elaphus*) in eastern Washington. *Northwest Science* 70:262-272.
- Dobler, F.C., J. Elby, C. Perry, S. Richardson, and M. Vander Haegen. 1996. Status of Washington's shrub-steppe ecosystem: extent, ownership, and wildlife/vegetation relationships. Washington Department of Fish and Wildlife, Wildlife Management Program, Olympia, WA. 39 pp
- Game Management Plan. July 2003-June 2009. Washington Department of Fish and Wildlife, Olympia, Washington, USA.
- McCorquodale, S.M. 1985. Archaeological evidence of elk in the Columbia Basin. *Northwest Science.* 59:192-197.
- Pautzke, C., B. Lauckhart and L. Springer. 1939. Washington elk report. State of Washington Department of Game. Seattle, WA, USA.
- Priority Habitat and Species List (<http://wdfw.wa.gov/hab/phslist.htm>)
- Priority Habitat and Species Recommendations (<http://wdfw.wa.gov/hab/phsrecs.htm>)

- Richardson, Scott, M. Whalen, D. Demers, and R. Milner. 1999. Ferruginous Hawk: Management Recommendations for Washington's Priority Species, Volume IV: Birds
- Rodrick, E. and R. Milner (Tech Ed). 1991. Management Recommendations for Washington's Priority Habitats and Species. Washington Dept. of Wildlife. Olympia, Washington.
- Saab, V.A., and T.D. Rich. 1997. Large-scale conservation assessment for Neotropical migratory land birds in the interior Columbia River basin. Gen. Tech. Rep. PNW-GTR-399. Portland, OR.
- Schroeder, M. A., D.W. Hays, M.F. Livingston, L.E. Stream, J.E. Jacobson, and D.J. Pierce. 2000. Changes in the distribution and abundance of sage grouse in Washington. *Northwestern Nat.* 81:104-112.
- Stinson, D.W., D.W. Hays, and M. Schroeder. 2004. State of Washington Greater Sage Grouse Recovery Plan. Washington Depart. Of Fish & Wildlife, Olympia, Washington, USA.
- Stinson, D. W., J. W. Watson, and Kelly R. McAllister. 2007. Washington State Status Report for the Bald Eagle. Washington Department of Fish and Wildlife, Olympia. 86 + viii pp.
- Vander Haegen, M.W., M.A. Schroeder, and R.M. Degraaf. 2002. Predation on real and artificial nests in shrub steppe landscapes fragmented by agriculture. *The Condor* 104:3.
- Washington Department of Fish and Wildlife. 2009. Wildlife Survey Data Management (WSDM). Olympia, Wash.
- Washington Department of Fish and Wildlife. 2008. 2009-2015 Game Management Plan. Wildlife Program. Washington Department of Fish and Wildlife. Olympia, Washington, USA.
- Washington Department of Fish and Wildlife. 2003. Game Management Plan. Washington Department of Fish and Wildlife, Olympia, Washington, USA.
- Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By Jeffrey C. Lewis and Jeffrey M. Azerrad. Pileated Woodpecker *Dryocopus pileatus*.
- Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By Steven M. Desimone and David W. Hays. Northern Goshawk *Accipiter gentilis*.
- Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By David W. Hays and Ruth L. Milner. Peregrine Falcon. Last updated: 1999.
- Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By Matthew Vander Haegen. Sage Sparrow *Amphispiza belli*. Last

Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By Matthew Vander Haegen. Sage Thrasher *Oreoscoptes montanus*. Last updated: 2003.

Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By Jeffrey C. Lewis, Morie Whalen, and Ruth L. Milner. Vaux's Swift *Chaetura vauxi*. Last updated: 2002

Washington Department of Fish and Wildlife . 2003. Management Recommendations for Washington Priority Species: Volume IV: Birds. By David W. Hays and Elizabeth A. Rodrick. Flammulated Owl *Otus flammeolus*. Last updated: 2003

Washington Department of Fish and Wildlife . 2002. Management Recommendations for Washington Priority Species: Volume IV: Birds. By Jeffrey C. Lewis and Elizabeth Rodrick. White-headed Woodpecker *Picoides albolarvatus*.

Washington Department of Fish and Wildlife. 1996. Washington State recovery plan for the ferruginous hawk. Olympia, Wash. 63pp.

WDFW Policies and Procedures (http://wdfw.wa.gov/depinfo/strat_goals_obj.htm)

WDFW Strategic Plan (http://wdfw.wa.gov/depinfo/strat_goals_obj.htm)

Western Regional Climate Center (wrcc@dri.edu)

Wildlife Area Statewide Plan (<http://wdfw.wa.gov/lands/lands2020/>)

Yakima Subbasin Fish and Wildlife Planning Board. 2004. Yakima Subbasin Plan. <http://www.nwcouncil.org/fw/subbasinplanning/yakima/plan/>