COLOCKUM WILDLIFE AREA MANAGEMENT PLAN

Washington Department of Fish and Wildlife

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STATE OF WASHINGTON

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Washington State Wildlife Area Plan

COLOCKUM WILDLIFE AREA

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

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November 2006

Director, Washington Department of Fish and Wildlife

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EXECUTIVE SUMMARY

The Colockum Wildlife Area was established in the mid 1950's to provide and protect critical summer and winter range for deer and elk as well as to perpetuate and improve upland game bird habitat. The wildlife area is located in Central Washington, approximately 15 miles south of the city of Wenatchee in Chelan and Kittitas Counties. Of the 91,603 acres that make up the Colockum Wildlife Area, the Washington Department of Fish and Wildlife (WDFW) owns 46,019 acres. The Washington Department of Natural Resources (DNR) owns 34,561 acres, which is interspersed in checkerboard fashion with WDFW lands. WDFW also manages 11,023 acres of U.S. Bureau of Land Management land through a memorandum of understanding. The property was purchased with funds from the Federal Aid in Wildlife Restoration Fund.

The primary management concerns and public issues identified in the Colockum Wildlife Area Plan are:

-Protecting and enhancing shrub-steppe, riparian and forest habitats.
-Maintaining fish and wildlife populations through habitat protection and enhancements.
-Monitoring and managing the impacts of public use on wintering elk.
-Providing public access compatible with fish, wildlife and habitat protection.
-Controlling noxious weeds such as knapweeds and thistles.
-Controlling trespass livestock grazing and damage to riparian areas.
-Using managed livestock grazing as a tool to manipulate habitat.

In 2006 WDFW continued efforts to improve habitats for big game through forage plantings, thinning overstocked timber stands, and ongoing weed control. An effort to monitor motor vehicle and public use was started with the purchase and installation of numerous (can we provide a number here?) car counters. Several miles of boundary fencing were built in problem areas and many miles of fence were maintained.

Projects planned for 2007 include removal of several stream-adjacent roads in Tekison and Stray Gulch, as well as removal of several stream diversions and culverts to improve fish passage and reduce entrapment. A major fertilization project is planned to enhance heavily used elk winter range. Monitoring of public use will continue. Measures to reduce harassment of wintering big game, such as restricting public access during the winter months in critical areas, are being considered. A proposal to trade lands to consolidate ownerships is also underway between WDFW and DNR. This exchange will redefine the Colockum's boundaries and enhance management efficiency.

CHAPTER I. INTRODUCTION

This plan provides management direction for the Colockum 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 his wildlife area. These goals and objectives are found in the Agency's Strategic Plan.

<u>Goal I: Healthy and diverse fish and wildlife populations and habitats</u>

- 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.

<u>Goal II: Sustainable fish and wildlife-related opportunities</u>

- 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.

<u>Goal III: Operational Excellence and Professional Service</u>

- Objective 11: Provide sound operational management of WDFW lands, facilities and access sites.
- Objective 15: Reconnect with those interested in Washington's fish and wildlife.

1.3 Agency Policies

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

- <u>Commission Policy 6003:</u> Domestic Livestock Grazing on Department Lands
- <u>Policy 6010:</u> Acquiring and disposing of real property
- <u>Policy 5211:</u> 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
- <u>Policy 5001:</u> Fish Protection At Water Diversions/Flow Control Structures And Fish Passage Structures
- <u>Policy:</u> Recreation management on WDFW Lands
- <u>Policy:</u> Commercial Use of WDFW Lands
- <u>Policy:</u> Forest Management on WDFW Lands
- <u>Policy:</u> Weed Management on WDFW Lands
- <u>Policy:</u> Fire Management on WDFW Lands
- Other policies/contractual obligations/responsibilities

1.4 Colockum Wildlife Area Goals

Management goals for the Colockum 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 Colockum 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 Colockum Wildlife Area. This process included identifying agency 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. CAG Representatives. (Colockum/L.T. Murray/Wenas/Oak Creek Wildlife Areas Citizens Advisory Group)

Name	Representing
Bailey, Ken	Non-Motorized Recreation (hikers, horse backers, bicyclists, campers, cross-country skiing, kayaks, 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	RMEF / NGO's / MDF / FNAWS
Hankins, Wes	NWTF / Bird Hunters / Hunting interests / Dog Training
Hedges, Neal	U.S. Bureau of Land Management
Juette, Randy	Commercial Use / Tourism
Kinney, Dan	Audubon Society
McNamee, Ken	Department of Natural Resources
Paolella, Ray	Cowiche Canyon Conservancy

Stegeman, Bill	Wenatchee Sportsman's Assoc.
Stephenson, Jim	Yakama Nation
Warnock, Doug	Big Game Management Roundtable
White, Bill	LMAC
Witke, Don	Wenas Muzzleloader Club
Zeimantz, Paul	Motorized Recreation (4 wheelers, motorcycles, jeeps, snowmobiles, boats, etc.), WSSA, WS 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 Colockum 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 Colockum Wildlife Area is located in Central Washington, approximately 15 miles south of the city of Wenatchee, in Kittitas and Chelan Counties. Of the 91,603 acres that make up the Colockum, the Washington Department of Fish and Wildlife (WDFW) owns 46,019 acres. The Washington Department of Natural Resources (WDNR) owns 34,561acres, which is interspersed in checkerboard fashion with WDFW lands. WDFW also manages 11,023 acres of U.S. Bureau of Land Management land through a memorandum of Understanding.

2.2 Purchase History and Purpose

The Colockum Wildlife Area was purchased by the Washington State Department of Game in the mid 1950's from several landowners, including the Arthur Coffin family. Funding for the purchase came from the Federal Aid in Wildlife Restoration Program. The purpose of these acquisitions was to expand the winter range for the Colockum deer and elk herds, and to perpetuate and improve the upland game bird habitat.

The Department of Game later merged with the Department of Fisheries and became the Washington Department of Fish and Wildlife (WDFW) in 1994.

The Colockum Wildlife Area provides innumerable opportunities for public users to enjoy outdoor recreational activities. Two of the most important uses are hunting and wildlife viewing. Reducing road densities and enhancing wildlife habitat have positive impacts on both activities. Thousands of visitors each year enjoy hunting, fishing, camping, and wildlife viewing on the Colockum. Additionally an increasing number visit the Wildlife Area to hike, horseback, bicycle, or bird-watch for just a day outing. As in most areas of the state, the W.A. has also seen a dramatic rise in non-wildlife oriented recreation use including ATV and snowmobile use, jeeps, "mudders", and target shooters.

Managerial History

Early management of the Colockum Wildlife Area began with management assistants and temporary labor directed by the Colockum Wildlife Area manager. Work consisted of fencing boundaries, signing entrances, coordinating and monitoring grazing leases, developing springs and habitat plots, and installing bird feeders and guzzlers. Long-term plans, budgets, and Pittman-Robinson federal funding were secured for the project to continue operations and maintenance as well as capital developments. Boundary surveys, habitat enhancement projects, road management programs, and a complete review of domestic livestock grazing on all the areas were the first priorities.

Alteration of the plant community has occurred over the years as a result of grazing, invasive exotic plant species, and fire. Historically, nearly all areas of the Colockum Wildlife Area had intensive livestock grazing of one form or another. Research and studies were conducted to determine impacts of livestock grazing on the various areas, and grazing was gradually reduced where it was not compatible with wildlife and habitat objectives. Currently one grazing lease exists on the northern edge of the Wildlife Area. It is part of a long standing agreement between WDFW, Washington State University, the Department of Natural Resources and a local lessee to provide an opportunity for livestock, wildlife and forestry research.

Approximately 35 miles of boundary stock fence on the Colockum has been maintained by WDFW to guard against livestock trespass, protect shrub steppe habitat, and restrict vehicular access into sensitive areas, thereby reducing damage to herbaceous cover needed for nesting and foraging by shrub steppe obligate species. The restriction of vehicle access, and livestock trespass also reduces the spread of undesirable weedy vegetation. These fences are inspected and repaired each spring prior to the livestock-grazing season.

In years past when livestock grazing was practiced on the Wildlife Area, numerous springs were developed to promote the dispersal of stock throughout the area and avoid concentrated use in the riparian corridors, those being the only places in which stock water was in abundance. Many of those springs have been maintained for use by wildlife. Cleaning and maintenance has been accomplished both by staff and volunteers.

Numerous roads and areas on the Colockum are treated annually to reduce non-native weedy vegetation. Treatments include herbicides, mechanical measures, and biological agents (insects). Where needed, native grasses are planted in treated areas to supplant weedy vegetation. Plans are underway to re-establish native-like vegetation on areas formerly used for intensive farming operations. This began in 1997and will continue as needed.

Habitat enhancement projects continue, and in compliance with State Forest Practice regulations, a complete Road Maintenance and Abandonment Plan (RMAP) was completed for the forested portions of the Colockum W.A. Further field review, site planning, and road maintenance or abandonment work is scheduled through 2015. Numerous roads have been closed on the Colockum since WDFW acquired it. Existing roads are minimally maintained due to limited funds and to keep public use at a reasonable level compatible with wildlife use of the area. Roads open for motorized travel are managed under the Green Dot road management system put in place in 1990. Green Dot maps are updated every two years to reflect closures and changes. WDFW will be conducting a comprehensive review of the Green Dot road management system in the Colockum to ensure that roads open to vehicular travel are not causing resource damage.

Few timber harvests have occurred on the WDFW-owned lands in the Colockum since purchase by the Department. The Department has practiced a hands-off approach to compensate for the active timber harvests occurring on neighboring lands. Timber stands were left to provide hiding and thermal cover for big game. Many WDFW timber stands have become overstocked and vulnerable to catastrophic wildfire. Forage plants preferred by big game have been reduced by tree competition. Beginning in 2005, WDFW implemented a timber stand improvement project where approximately 500 acres of timber will be thinned, slash will be burned and then reseeded with native grasses, forbs and shrubs. More thinning is planned to address fuels loading, insect and disease issues, and catastrophic fire danger, as well as habitat improvement. Although WDNR is responsible for fire protection within the forested environment on the Colockum, these thinning projects will help reduce the potential damage to wildlife habitat as well as adjacent property by catastrophic wildfire.

2.3 Ownership and Use of Adjacent Lands

The Colockum W.A. is bordered on the west by USFS land managed as part of the Wenatchee National Forest and to the west and south by a checkerboard ownership of WDNR and Western Pacific Timber Co. lands. To the north are many private lands and some WDNR sections. Land to

the west of the Colockum Pass road is primarily timberlands while those to the east are mainly shrub-steppe.

The Quilomene and Whiskey Dick Wildlife Areas border the Colockum on the south in the shrub-steppe area and drain into the Columbia River. Most of the privately owned adjoining lands are used for timber management, grazing of livestock, and for recreational purposes.

For over 35 years, WDFW has leased approximately 125,000 acres of shrub steppe and partially timbered lands from the Department of Natural Resources. These lands are common school trust lands that are managed by DNR to generate revenue for school construction. The lands are intermixed with Department of Fish and Wildlife (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 reduced funding for those leases by $270,000/biennium as part of a much larger general fund reduction for the department. That action 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 approx. 45,000 acres of forested lands in Kittitas and Yakima counties to DNR in exchange for 125,000 acres of shrub steppe lands. The exchange would also allow WDFW to take ownership of 12 water access sites that were also leased from DNR.

The exchange of lands will be on value for value basis and the exact ownerships or boundary of the exchange will not be known until appraisal and timber valuations have been completed. The legislature approved funding for WDFW to begin the appraisal and review process in the 2006 legislature and the agencies expect to exchange lands sometime in 2007.

This land exchange is subject to the National Environmental Policy Act since most of WDFW's lands were purchased and have been maintained with federal funds.

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

The Colockum Wildlife Area is funded under the Federal Pittman Robinson (PR) program, which provides operating monies for qualifying Wildlife Areas. The Colockum has an annual PR budget of $63,429.00 (75% federal, 25% state match). An additional $73,252.00 per year is provided by state general funds.

One full time staff position (Manager) and two seasonal technicians are supported for the purpose of weed control and fence repairs.

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.

2.5 Climate

Climate is the most important environmental factor influencing the region. Lying in the "dry shadow" of the Cascade Mountains, precipitation measuring less than 4 inches falls annually on the eastern extreme of the Colockum, but up to 100 inches of snow may fall in the higher more westerly locations. Elevations on the Colockum range from 480 feet to 6,875 feet, contributing to the widespread ecological diversity.

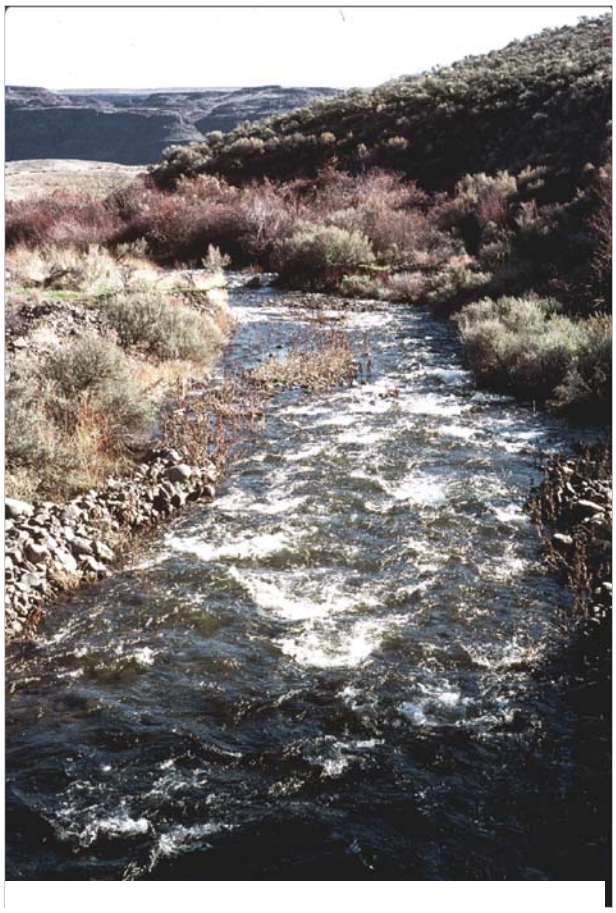
Total precipitation ranges from four to 50 inches annually, with the majority coming during the winter months.

2.6 Soils and Geology

The Colockum Wildlife Area to the east is characterized by steep, rocky slopes, and a rolling series of ridges and canyons that generally drain west to east. The parent bedrock material in the region consists of basaltic rock, and includes fractured and folded lava flows. The basalt material has weathered down into coarse gravels, cobbles, and boulders, with fine silts and clays. The overlying soil is composed of fine-grained loess, deposits of volcanic ash, sandy loams, and silt loams.

2.7 Hydrology and Watersheds

Year-round surface water is scarce on the Wildlife Area. The major water source is fifteen miles of the Columbia River, acting as the eastern boundary to the Colockum. Clara and Marion are two lakes found on the northwest boundary at 5,500 feet in elevation. Three year-round streams include Colockum, Coleman and Brushy Creeks. Intermittent streams are found in the Whitson, north and south forks of Tarpiscan Creek, Stray and Tekison drainages. These streams furnish adequate water to fill numerous beaver ponds, which are an important source of water for wildlife. Numerous springs and an occasional seasonal pond complete the area's water resources.



Intermittent Stream: Tekison Creek

2.8 Fire History

Vigorous fire protection, development of ladder fuels, over-stocked tree stands, insects and disease infestations have made timber stands on the Colockum susceptible to stand replacement fires. Over the years, several small fires have broken out on the

Colockum.

Fires have been both natural and man-caused. In 1981 and 2000, fires started by fireworks on July 4 burned 2,000 acres and 500 acres respectively on West Bar. In the year 2000, a target shooter caused a seventy-acre fire. In 1970, the lightning caused Game Reserve fire burned 3,000 acres of timbered habitat.

Fortunately the Wildlife Area has escaped a truly catastrophic wildfire, but is certainly at high risk for one. This is one of the principal motivators for planning and implementing thinning/habitat improvement projects on the Wildlife Area. It is hoped that enough of this work can be completed to avoid loss of human life, wildlife, habitat, watershed, and timber resources from wildfire. Prescribed burning will be an integral part of these projects as well. WDNR is responsible for wildfire suppression and prevention on the timbered portions of the Colockum. An emergency fire suppression agreement is in place between WDFW and WDNR for suppression efforts on the shrub-steppe habitat to the east.

Uncontrolled wildfires in shrub steppe habitat such as the Colockum 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). Native bunchgrasses are tolerant of low intensity fires but the invasion of noxious weeds such as cheatgrass have altered the intensity of fires. These weedy species grow in dense stands, filling interspaces between bunchgrasses, forbs and shrubs and fuel intense fires that kill these native plants. Weedy invaders tend to out compete plants 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.

2.9 Vegetation Characterization

Approximately 30,000 acres of the Colockum are conifer forest, and the balance is predominantly shrub steppe. Vegetation ranges from the lower elevation shrubs and bunch grasses into Ponderosa Pine, then to higher elevations with denser stands of timber comprised mostly of Douglas fir, grand fir, and some larch. Grasslands interspersed with rock outcrops and shrub-steppe communities dominate hillsides in transitional

Naneum Ridge

zones. The dominant grass communities consist of wheat grasses, fescues, bluegrasses, and a variety of forbs. Common shrub species are bitterbrush, ceanothus, snowberry, rose, serviceberry, and several currants. These dense stands of trees and/or shrubs provide hiding, escape and thermal cover, shade, foraging and nesting sites, perches, and water sources.

All of these highly productive communities often contain both plant and wildlife species that are endangered or threatened.

2.10 Important Habitats

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

Shrub steppe – The majority of the arid portions of the Colockum Wildlife Area is comprised of shrub steppe habitat (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.

Hedgehog cactus in Shrub-steppe

Forest – A large portion of the Colockum is forest habitat consisting of Ponderosa Pine and mixed conifer stands. Priority wildlife species inhabit many of these stands.

Riparian – Large drainages such as Colockum , Tarpiscan, Tekison and Brushy Creeks make up the major riparian areas on the Wildlife Area. This cover type is a primary factor influencing the quality and health of fish habitat. Riparian vegetation provides thermal cover and is an important habitat for a variety of wildlife. It also creates stream channel features such as pools, and maintains stream bank stability.

Talus/Cliffs – There are many areas of exposed rock or fields of broken rock. These landscape features provide key habitat requisites that are often missing for various species such as bighorn sheep, golden eagles, a variety of bat and raptor species and a host of other species.

2.11 Fish and Wildlife

The protection and enhancement of fish and wildlife and their habitats is the number one priority when developing management strategies on the Wildlife Areas. 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. Resident and migratory fish species such as Chinook, sockeye and coho salmon, steelhead, small mouth bass, perch, trout, walleye and white sturgeon as well as many other species inhabit the Columbia River and it's tributaries on the Wildlife Area. Management plans have been developed in one form or another for most big game and threatened and endangered species. Brief accounts for primary species are listed below.

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 Colockum 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 eastern part of the Colockum Wildlife Area is used by a major portion of the Colockum elk Herd, especially during winter on land purchased specifically for winter range. Plans for maintaining target herd numbers, managing hunting seasons, and addressing depredation problems on neighboring lands etc. is addressed in the December 2005 Draft Colockum Elk Herd Plan. Additional work to solve problems created by elk on private ownership is being done 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.

Spike elk wandering old hunting camp

The Colockum Elk Herd plan (2005) is currently in draft with expected completion due in the spring of 2006. Herd objective goals (4275-4725 elk) were laid out in the WDFW's 2003-2009 Game Management Plan (2003) with the Colockum plan providing detailed guidance in herd management. The Colockum Wildlife Area Plan and Colockum 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 needing management actions include: livestock grazing management, vehicle access management, fire protection, management of old agricultural fields and management of the Coffin Reserve etc.

A study (Bracken and Musser 1993) of the Colockum Elk herd was conducted to determine what habitat is most important to Colockum elk and how they use the range with regards to habitat and human use. Cover, forage, water, weather and road influences were among the components evaluated. How elk used forage and cover depended 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 disturbance issues. 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 Colockum, occupying various habitats from alpine areas in the Cascades, to the shrub steppe/grassland habitats along the eastern fringes next to the Columbia River. Summer range consists of bunchgrass communities interspersed with timber stands that provide fawning and hiding cover in the western part of the Colockum. The eastern part of the Colockum provides winter and spring range in the form of bunchgrass and particularly Sand bergs bluegrass communities.

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

California Bighorn Sheep

Bighorn sheep were native to Washington and archeological evidence showed they inhabited the uplands throughout the Columbia River and particularly those throughout the Colockum Wildlife Area. Bighorns were extirpated around 1930 and efforts to bring them back were initiated in the 1950,s and continue to this day. The Colockum was one of the first areas where re-introductions were accomplished and the population thrived until a likely outbreak of pneumonia, *Pasteurella heamolytica*, occurred in the 1980,s. Re-introductions were again conducted starting in 1993 with 41 bighorns being released by 1996. Since then bighorns have distributed themselves along the Columbia River from Malaga to the Skookumchuck drainage. The current population approximates 160 sheep (Bernatowicz, 2003) with herd objectives at 250-300 sheep. Bighorns utilize the steep cliffs, rock outcrops and talus slopes for security and the 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.

Merriam's Turkey

Merriam turkeys were introduced into the Colockum area in the 1990's. The population has grown significantly with turkeys becoming a highly sought after game bird. While releases were made in the Tarpiscan and Brushy drainages turkeys have expanded throughout the Colockum to the west as far as Naneum Creek and appear to be well established. To enhance their survival the Wenatchee Sportsmen's Association has helped install feeders to supplement food for winter survival since the likely limiting factor is sufficient food during the winter. Some controversy surrounds the establishment of this game bird with concerns that they eat native species of invertebrates that may be threatened or endangered. To date there has been no evidence to support this theory. Turkeys subsist on mast producing plants during the fall and winter months and rely on insects, forbs and succulent grasses during the spring and summer.

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 estimated 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 CRP

programs have allowed habitat to recover helping to sustain the population and in Kittitas and Yakima Counties residing mostly on the U.S. Army Yakima Training Center. Although the Colockum does not support large numbers of sage grouse and they are only occasionally seen there the habitat on the eastern border of the Colockum and Whiskey Dick/Quillomene are considered critical linkages for these populations to interchange and is the only contiguous habitat between the two sub populations. 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. The original intent for converting the Brushy agricultural fields into CRP was based on this objective as well as future management concerns.

Chukar

Chukar, an exotic game bird introduced in the 1930's, has been very successful and are highly sought after by sportsmen throughout the western United States. Land on the eastern border of the Colockum has some of the best chukar habitat in the area but because of difficult access is somewhat limiting in terms of hunting pressure. Chukar prefer deep river canyons with rocky terrain for security and feed on grasses, seeds, forbs, shrub fruits and insects. Weather, particularly deep snow, can influence population levels (Christensen, 1976).

Forest Grouse (Blue, Spruce, Ruffed)

Blue and Ruffed grouse are the more prominent grouse species on the Colockum W.A. while Spruce grouse may occur in low numbers at higher elevations. 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 and 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 can help open stands in lower elevations and allow forbs and grasses to increase but 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. Territories vary in the number of alternate nests most likely due to the amount of cliff space and material to make nests. On the Colockum there are four identified territories, however one may have been misidentified since red-tailed hawks have been using it for some time while one other has not had occupancy since surveys began in the 1980's. Three territories have been occupied with varying degrees of success yearly. Limiting factors can vary on success of sites and in the case of the Colockum the main threat is most likely disturbance of nest sites and possibly contaminated prey. Golden eagles main prey source in the Colockum is probably chukar and domestic pigeons. Hares, rabbits, ground squirrels, marmots and sage grouse were probably important historically, but are in limited supply due to fires removing habitat and conversion of historical shrub steppe habitat to agricultural lands. Rock climbing on and

recreational activities adjacent to nest cliffs should be evaluated for potential disturbance and the need for restrictions to ensure nest success.

Black-tailed & White-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 where they reside. 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 relative recent addition to Washington invading the state from the south around 1870 (WA-PS-154). It is found in areas with less than l0 inches of rainfall within the shrub steppe communities. They both feed on almost any green vegetation with 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 Colockum W.A. with the White-tailed hare being the most prominent species. Maintaining the shrub steppe community is key to continued management for these species.

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 Colockum Wildlife area contains shrub steppe communities that support these species.

Other Priority species, which are found on the wildlife areas include: bald eagle which are primarily winter migrants; peregrine falcons have recently returned near vantage but currently forage on Colockum lands and will likely nest on cliffs of the Colockum in the future; prairie falcon which nest on cliffs above the Columbia River and major side canyons; northern goshawk are mature forest inhabitants and effected by timber harvest; loggerhead shrike feed on large insects in arid areas; As recent as the late 1980`s Pronghorn antelope inhabited the arid region from West Bar to the south of the Wildlife Area. WDFW is currently evaluating the potential to re-introduce this historically native ungulate back into Washington. (Information on priority Habitats and Species list are available at http://wdfw.wa.gov/hab/phsvert.htm#birds)

Migratory Salmonids

The Columbia River borders the east side of the Colockum Wildlife Area for approximately 18 miles. For anadromous salmonids such as Chinook, sockeye and coho salmon (adults and juveniles) it serves mainly as a migration corridor migrating to and from tributary habitats. The Columbia River itself provides limited spawning and rearing habitat for these species. However, the mouths of the major tributaries to the Columbia that flow through the Wildlife Area are likely important as off-channel rearing sites to anadromous fish. Upper Columbia River steelhead are currently listed as threatened and Upper Columbia spring Chinook salmon are listed as endangered

under the Endangered Species Act. Colockum Creek, Tarpiscan Creek, Tekison Creek and Brushy Creek are major drainages the flow west to east to the Columbia River. Colockum Creek (includes both north and south forks) historically supported anadromous fish. Currently, due to fish passage barriers (culvert) the stream is not accessible to anadromous species. Tarpiscan Creek also historically supported anadromous fish. Both the north and south forks of Tarpiscan Creek are inaccessible to anadromous fish due to fish passage barriers. Tekison Creek flows intermittently throughout the year and may have historic salmon and steelhead use. Brushy Creek is the southern most stream on the Wildlife Area. In 2004 steelhead were observed spawning as far as 5 miles upstream from the mouth. An old irrigation diversion exists in the creek that diverts water out of the main channel.

Resident Fish

Resident fish species present in the Columbia River include rainbow trout, bull trout, small mouth bass, walleye, yellow perch, white sturgeon, northern pikeminnow, suckers, peamouth, chiselmouth, carp, skulpin, speckled dace and redside shiners. Resident rainbow trout are present in many of the streams and beaver ponds on the Wildlife Area, including Colockum Creek, Tarpiscan Creek, Tekison Creek, Stray Gulch, Cooke Creek and Coleman Creek. Eastern brook trout and cutthroat trout were historically present in most of these creeks as well but have not been documented recently. The two lakes on the Wildlife Area, Clara and Marion Lakes were planted to Westslope cutthroat trout in 2001 and 2005.

Table 2. Listed species that occur, or have the potential to use the Wildlife Area

Bald Eagle	ST, FSC
Bull Trout	FT, SC
Burrowing Owl	SC, FSC
Ferruginous Hawk	ST, FSC
Flammulated Owl	SC
Golden Eagle	SC
Loggerhead Shrike	SC, FSC
Northern Goshawk	SC, FSC
Peregrine Falcon	FSC
Pileated Woodpecker	SC
Sage Grouse	ST
Sage Sparrow	SC
Sage Thrasher	SC
Townsend's Big-Eared Bat	SC, FSC
Upper Columbia Spring Chinnok Salmon	FE, SC
Upper Columbia Steelhead	FT, SC
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), Federal threatened (FT).

Cultural, geological, and other non-renewable resources are protected, and may not be removed unless such removal is beneficial to fish, 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, plants, seeds, and other items by members of the public.

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, 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 Colockum 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 Colockum 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. The Game Management Plan calls for an increase in the Colockum elk herd and bighorn sheep population. Public concerns include elk damage to private lands and the use of grazing on the wildlife area.

A. *Strategy*: Maintain elk herd size of 4,275-4,725; bighorn sheep herd size of 250-300, and maintain or increase deer herd size. Timeframe: Year-around. *Justification:* Refer to the Game Management Plan.

B. *Strategy*: Maintain the 35 miles of stock fence along the boundaries of the Colockum Wildlife Area. Timeframe: Annually, March-October. *Justification:* Minimize cattle trespass on forage used for winter and summer ranges.

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

D. *Strategy*: Monitor public use on the Colockum Wildlife Area to determine if other closures to vehicles or public access are needed to protect big game from disturbance during critical periods. Timeframe: Annually. *Justification: Prevent harassment causing elk energy loss and agricultural land damage.*

E. *Strategy*: Conduct weed control and reseed degraded areas. *Justification*: Improves habitat conditions, increases plant diversity, legally required.

F. *Strategy*: Maintain 180 acres agricultural fields in Tarpiscan in grain or forage grasses. Timeframe: Ongoing. *Justification*: Provide high quality forage and reduce elk damage to private lands.

G. Strategy: Maintain the existing 40 acres of high elevation meadows as forage areas by tree seedling removal and fertilization. Timeframe: Ongoing. *Justification*: Provide high quality forage, increases summer range forage.

H. Strategy: Maintain spring developments. Timeframe: Ongoing, Spring. *Justification:* Provides water for wildlife, distributes populations.

I. Strategy: Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats. Sub-objective 6 (Shrub steppe habitat).

J. Strategy: Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats. Sub-objective: 7 (Forest habitat).

2. Improve and maintain fish populations

The Colockum Wildlife Area borders the Columbia River, which supports federally listed salmon and steelhead species. Several tributary streams on the Wildlife Area have high potential to provide spawning and rearing habitat for these fish species. The most common limiting factors for both summer steelhead and spring Chinook are stream flow and temperature, habitat diversity, sediment load, and quantity of key habitats for various life stages.

A. *Strategy*: Assess fish species composition and abundance on all streams of the Colockum Wildlife Area. *Justification:* Needed to plan habitat improvement projects and measure success.

B. *Strategy*: Continue Road Maintenance and Abandonment Planning (RMAP) work to address sediment delivery and other issues related to roads and fish, particularly in the case of stream adjacent roads. Timeframe: 2007-2008. *Justification:* Stream adjacent roads deliver sediment to streams, detrimental to fish. RMAP work required by State law.

C. *Strategy*: Correct known passage barriers/sedimentation issues on Colockum, Tekison, Tarpiscan and Brushy creeks. Timeframe: 2007. *Justification:* Passage barriers prevent recolonization by anadromous fish.

D. *Strategy*: Review roads on Colockum Wildlife Area for potential to deliver sediment and other issues relating to roads and fish. Develop a plan for addressing these issues. Timeframe: Completed 2004-2005. *Justification:* Sets priorities on road management while alleviating sediment that is detrimental to fish.

E. *Strategy*: Restore riparian habitat with shrub and tree plantings Tarpiscan, Tekison, and Brushy Creeks. *Justification:* Quality riparian habitat reduces sediment in streams, shades water and reduces temperatures.

F. *Strategy:* Reduce riparian sediment delivery by re-configuration of down cut channels and log jam placement to bring back natural witdth-depth ratios and channel migration. *Justification:* Roads, dikes and livestock grazing contribute to down cut channels increasing sediment delivery to the streams. Re-configuration allows re-establishment of natural conditions.

3. Manage for upland birds

The Colockum Wildlife Area was purchased to protect critical winter range for big game, as well as to perpetuate and improve upland game bird habitat. The Colockum 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 areas are expected to continue to provide significant recreational opportunities.

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

B. *Strategy*: Maintain guzzlers to provide water for upland birds and other species. Timeframe: Ongoing. *Justification:* Protect capitol investments while allowing greater dispersion of wildlife.

C. *Strategy*: Field review all undeveloped springs on the wildlife areas and develop maintenance or restoration plans. *Justification:* Allows systematic method and tracking of maintenance needs.

D. *Strategy:* Continue to maintain and fill 20 upland bird feeders. Timeframe: Ongoing. *Justification:* Provides enhanced winter survival for some upland birds during harsh winters and embraces public support.
E. *Strategy:* Maintain the 35 miles of stock fence along the W.A. boundary. Timeframe: Annually, March-October. *Justification:* Reduce the loss of nesting cover and prevents damage to riparian areas valuable to upland birds.
F. *Strategy:* Conduct weed control activities. Timeframe: Ongoing. *Justification:* Weeds degrade quality of habitats. Weed control required by State law.

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.
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:* Data allows better management of species and habitats and co-ordination *a*voids duplicity and saves capital resources.
C. *Strategy*: Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats. Sub-objective: 7 (Forest habitats). *Justification*: Healthy, diverse forests support wildlife species diversity.

5. Protect and restore riparian habitat

The agency has prioritized riparian habitat management and protection. 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*: Implement permanent road closures in Tekison Creek and Stray Gulch. Provide alternate road access to West Bar and Brushy areas. Timeframe: 2007. *Justification*: Stream adjacent roads are a source of sediment delivery to creeks.
B. *Strategy:* Conduct weed control and reseed degraded areas. Timeframe: 2007. *Justification:* Improves habitat conditions, increases plant diversity. Required by State law.
C. Strategy: Restore riparian habitat with tree and shrub plantings along Tarpiscan, Tekison and Brushy Creeks. Timeframe: 2007-2008. *Justification*: Reduce sediment delivery to streams, provide shade over creek.
D. *Strategy*: Continue to exceed Forest Practices regulations regarding riparian buffer requirements for timber harvest practices on all Colockum project areas scheduled for thinning/habitat improvement treatments. Buffers will typically be between 250 and 400 feet. Timeframe: Ongoing. *Justification*: Reduce sediment delivery to creeks and protect riparian zones. Allows case-by-case habitat protection.
E. *Strategy*: Maintain stock fence along Wildlife Area boundary. Timeframe: Year-around. *Justification:* Reduces undesired use of forage by livestock and prevents damage to riparian areas.

6. Protect and Restore Shrub Steppe Habitat

The agency has prioritized shrub-steppe habitat management and protection. 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.

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.

C. *Strategy*: Conduct weed surveys and continue to control weeds. Timeframe: Fall 2006. *Justification:* Weed control improves habitat condition and, increases plant diversity.

D. *Strategy*: Continue to monitor Cape Horn and Brushy CRP fields. Improve marginal areas by weed control, tillage and reseeding. Timeframe: Annually, March-October. *Justification:* To bring restoration to completion while increasing plant diversity and quality of habitat.

E. *Strategy*: Maintain stock fence along Wildlife Area boundary. Timeframe: Year around. *Justification:* Excludes trespass livestock and reduces loss of forage and damage from overgrazing.

F. *Strategy*: Monitor Scroggie grazing lease. Maintain and monitor grazing enclosures. Timeframe: Annually. *Justification:* Prevent overgrazing and overuse of riparian habitats while gathering data on wildlife/livestock habitat use and impacts over time.

7. Protect and restore forest habitats

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

A. *Strategy*: Conduct prescribed burns on up to 500 acres of thinned timber stands in the Jump-off Ridge and S.F. Colockum Creek areas that were thinned in 2005 and 2006. Timeframe: 2007. *Justification:* Reduce fuel load and stimulates fire dependant forage species preferred by ungulates.

B. *Strategy*: Reseed native grasses, forbs and shrubs in landings, skid trails, roads and other disturbed areas. *Justification*: Reduces weed invasion and erosion while increasing forage.

C. *Strategy*: Assess remaining low elevation timber stands on the Colockum Wildlife Area for under story thinning and prescribed burning need and potential to reduce risk of catastrophic fire, insect and disease potential and create forest conditions more suitable to a diversity of species. *Justification:* Inventory data needed to plan future projects.

D. *Strategy*: Monitor timber thinning operations and subsequent prescribed burning to evaluate vegetative response. Timeframe: 2007. *Justification*: Data needed to measure degree of success of project.

E. *Strategy*: Maintain 35 miles of stock fence along boundary of Wildlife Area. Timeframe: Year around. *Justification*: Exclude trespass livestock and reduce loss of forage in forested habitats.

F. Strategy: Coordinate with WA.DNR and local fire districts on burn bans, fireworks closures, signage, and public outreach. Timeframe: Annually. Justification: Prevents confusion and enhances fire protection.

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 addressing priority fish species. *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. Timeframe: Ongoing. *Justification:* Supports high wildlife species diversity and reduces weed intrusions.

C. *Strategy*: Protect and preserve sensitive wildlife sites such as active bald and golden eagle and peregrine falcon nests, big horn sheep lambing areas, elk calving areas, and big game wintering areas from human disturbance. Timeframe: Ongoing. *Justification:* Human disturbance increases stress and reduces survival of sensitive wildlife.

D. *Strategy*: Protect snags for cavity excavators, nesting and foraging wildlife species. Many cavity nesting forest birds depend on the primary cavity excavators. Many, like the white headed woodpecker, depend on large diameter snags for foraging and nesting. Timeframe: Ongoing. *Justification:* Snags have been eliminated from many forest stands during logging operations and are becoming scarce and foraging habitat is becoming limited.

E. *Strategy*: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats. Sub-objective 7 (Timber thinning and prescribed buns). Protect and create snags in association with timber thinning projects. *Justification:* Limited number of snags, suitable nest sites.

F. *Strategy*: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats. Sub-objective 7 (Forest Habitat Protection and Restoration). Under-story 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 healthier forest stands and greater wildlife use.

G. *Strategy*: Maintain and expand nest box placement on all units. *Justification*: Limited cavity nest sites for passerine cavity nesters.

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. Timeframe: Ongoing. *Justification:* Provides public access and provides management consistency.

B. *Strategy*: Close road access, either seasonally or permanently, where road conditions are not safe or where road conditions have a significant negative impact on fish and wildlife. Timeframe: Annually. *Justification*: Increase safety and reduce habitat impacts.

C. *Strategy*: Continue to implement the Colockum Wildlife Area Road Management and Abandonment Plan as required by Forest Practices regulations. Timeframe: 2007-2008. *Justification:* Legally mandated and provides resource protection.

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 throughout the Colockum Wildlife Area. In addition, 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 and public users are liable at all times for their campfires. Timeframe: Year around. *Justification:* Provides public use opportunities while protecting resources.

F. *Strategy*: Provide hunting opportunities for persons with disabilities by designating a road used only by persons with disabilities. Timeframe: 2007. *Justification:* Provide reasonable access to increase opportunities for the disabled.

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.

H. *Strategy*: Develop a GIS-based Green Dot Road Management map for distribution to the public. Timeframe: 2006-2007. *Justification:* Improves management efficiency and aids the public.

2. Provide commercial opportunities 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 contractors to complete timber stand enhancement projects such as thinning. Timeframe: 2006. *Justification:* Improves forest health utilizing those with the means to do so.

B. *Strategy*: Work with U.S. Forest Service and Mission Ridge Ski Area to operate the ski area in accordance with existing agreements. Timeframe: Annually. *Justification:* Reduces wildlife impacts while maintaining cooperative relationship.

C. *Strategy:* Continue lease agreements with private enterprises for radio and microwave sites on Mission Ridge. Timeframe: Annually. *Justification:* Provides commercial opportunity with minimal impact.

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. Sub-objective 1 (winter closures and monitor public use). *Justification:* Reduce body energy loss to wildlife.

B. *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 (green dot road Mgmt). *Justification*: Reduce disturbance to wildlife.

2. Implement strategies to reduce elk damage on private lands

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

A. Strategy: Maintain 180 acres agricultural fields in Tarpiscan in grain or forage grasses. Timeframe: Ongoing. Justification: Reduces elk leaving public lands.

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

C. *Strategy*: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats. Sub-objective 7 (forest habitats). *Justification:* Improve habitat on public lands.

D. *Strategy*: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats. Sub-objective 1 (green dot road mgmt.). *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

Noxious 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.

Weed control on the Colockum Wildlife Area has been an increasingly successful endeavor with the recent increase in funding, improvements to spray equipment, the release of biological control species, and cooperative efforts with Kittitas County.

A. *Strategy*: Produce and implement weed management plan **(Appendix 2)** to include weed identification and inventory, risk/threat, control priorities, and monitoring. Timeframe: Completed 2005. *Justification:* Increase weed control efficiency.

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

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

D. *Strategy*: Continue to control weeds along all roads on the wildlife areas. Expect to treat 20 miles of roads per year to reduce the spread of noxious weeds. Timeframe: Ongoing. *Justification: vehicles spread many weeds.*

E. *Strategy*: Electronically map weed locations. Invest in ArcPad software, a Dell Axim X50 handheld pc/data collector, and a Pharos GPS 360 receiver to improve the efficiency of the wildlife areas noxious weed control program by making data collection, record keeping, reporting and monitoring easier, as well as improving the efficiency of downloading data into ArcView for manipulation and use with other ArcView layers and map production. Timeframe: Spring 2007. *Justification:* Improves weed control efficiency.

F. *Strategy*: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats. Sub-objective 1 and 6. (Maintain Tarpiscan fields, improve CRP and maintain stock fence). *Justification:* Reduces weeds, reduce soil and habitat disturbance.

2. Manage species and habitats 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 public lands. Forest thinning operations on agency lands must follow state forest practice law.

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

B. *Strategy*: Develop specific strategies associated with ESA species present or potential. Timeframe: Ongoing. *Justification:* Increase ESA compliance.

C. *Strategy*: Implement the Colockum Forest Road Management and Abandonment Plan. Timeframe: 2007-2008. *Justification:* Legally required and provides sedimentation control.

D. *Strategy*: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their Habitats. Sub-objective 2 and 4 (fish passage and sedimentation). *Justification*: Legally required.

E. *Strategy*: Map all ESA species and their habitats on the wildlife areas and develop GIS layers depicting the location and species. *Justification*: Increases management efficiency and effectiveness of ESA species.

F. *Strategy*: Develop specific management practices associated with ESA species present or likely present. *Justification:* Reduce inadvertent negative impacts to wildlife while increasing management efficiency.

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

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*: Enter into contracts/agreements with local, state or federal entities to provide fire suppression support on the Colockum W.A. Timeframe: Annually. *Justification:* DNR & USFS have firefighting equipment and personnel to control catastrophic unplanned wildfires.

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

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

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

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.

B. *Strategy*: Perform cultural resource survey and assessment before digging - including posts for new fence line, parking lots, toilets, buildings, new agricultural fields, etc. *Justification:* Required by State law.

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

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

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 activites 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) via the Regional Program Manager. Timeframe: Ongoing. *Justification*: Maintains communication and coordination with public and landowners.

B. *Strategy*: Attend and participate in CRM meetings that involve grazing permits adjacent to the Colockum Wildlife Area that could impact management on the wildlife areas. Timeframe: Ongoing. *Justification*: Increases management efficiency and coordination between entities involved.

2. Involve the public in projects on the wildlife areas

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:* Solicit help from local conservation groups and clubs on habitat enhancement projects. Timeframe: Ongoing. *Justification:* Assistance for Wildlife Area staff in accomplishing desired projects and increasing public awareness.

B. *Strategy:* Coordinate with local user groups on Wildlife Area clean-ups. Timeframe: Ongoing. *Justification:* Assure clean-up projects occur.

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

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 the headquarters facility to provide a safe and effective workplace. Maintain structures such as residence, shops and equipment storage. Provide utilities, phone, computers, etc. Timeframe: Ongoing. *Justification:* Efficient operation of the Wildlife Area requires maintenance of a functional headquarters.

B. *Strategy*: Maintain all fences to prevent trespass livestock. Survey boundary stock fence, prioritizing repair work based on sections where livestock are present on adjacent lands. Timeframe: Ongoing. *Justification:* Excludes trespass livestock.

C. *Strategy*: Survey ownership and build new stock fence on the surveyed boundary of the Carr/Harden property. *Justification:* Cleans up property lines, excludes trespass livestock, and prevents development trespass.

D. *Strategy*: Assess the need for 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.

E. *Strategy*: Maintain roads to prevent resource damage and provide access. Tarpiscan, Brewton, Tekison and Brushy roads need grading and repair. *Justification:* Maintains public access and prevents resource damage.

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

2. Maintain other structures and physical improvements

A. *Strategy*: Maintain all signs, gates, culverts, water structures, wells and irrigation systems. Timeframe: Ongoing. *Justification:* Required for efficient operation of Wildlife Area.

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

3. Maintain equipment

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

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

4. Pursue funding opportunities

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

B. *Strategy*: Investigate whether Wildlife Area rangelands would meet the requirements of SRP. Where applicable, enroll lands in CRP, SRP and other federal programs to generate revenue and accomplish desired habitat conditions. Timeframe: Ongoing. *Justification:* Improves habitat, reduces erosion and weeds, supplements budgets.

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 safety issues and increase risk of detrimental forest insects and disease.

A. *Strategy*: Assess/implement timber-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. *Justification:* Responsible forest management.

6. Perform administrative responsibilities

A. *Strategy*: Develop and monitor budgets. Timeframe: Ongoing. *Justification:* Determines outcomes.

B. *Strategy*: Supervise employees. Timeframe: Ongoing. *Justification:* Legally required.

C. *Strategy*: Maintain files and records. Timeframe: Ongoing. *Justification:* Track work over time.

D. *Strategy*: Write reports. Timeframe: Ongoing. *Justification:* Agency required.

E. *Strategy*: See Agency Objective: Reconnect with Those Interested in Washington's Fish and Wildlife. Sub-objective 1. (Attend and participate in CRM meetings). *Justification:* Management actions addressed.

F. *Strategy*: Agency Objective: Reconnect with Those Interested in Washington's Fish and Wildlife. Sub-objective 1 (Co-ordinate with Regional Program Manager or attend Big Game Management Roundtable (BGMR meetings). *Justification:* Enhances communications on resolving issues.

G. *Strategy*: Work with staff to ensure high morale and job satisfaction. Promote self-motivation and good work ethics. Timeframe: Ongoing. *Justification:* General part of supervision.

H. *Strategy*: Supervise contractors, lessees, permittees, volunteers, Washington Conservation Corps employees, other WDFW personnel, and public and private organizations on the wildlife areas. Timeframe: Ongoing. *Justification:* Ensures compliance of work.

I. *Strategy*: Write, update and implement a wildlife area management plan, weed control plan and fire control plan. Timeframe: Completed all draft plans in 2006. Updates and implementation is ongoing. *Justification:* Agency policy and assists in systematic approach to control.

J. *Strategy*: Conduct wildlife and habitat surveys. Identify and prioritize information and survey needs. *Justification:* Determine status of Wildlife and habitat conditions for management options.

K. *Strategy*: Manage an extensive equipment inventory used for habitat maintenance, enhancement, restoration and preservation. Timeframe: Ongoing. *Justification:* Ensures successful operation.

L. *Strategy*: Plan for and purchase supplies, tools and equipment. *Timeframe*: Ongoing. *Justification:* Part of administrating the W.A.

M. *Strategy*: Attend meetings and meet with private individuals and agency representatives as needed. *Timeframe:* Ongoing. *Justification:* General part of work.

7. Maintain a knowledgeable and well-trained work force

A. *Strategy*: Provide red card training for wildlife area manager. *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. *Timeframe*: Annually *Justification:* Legally required.

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

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 in-stream volumes for fish and other animals.

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

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

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

Wildlife Area plan performance measures are listed below. This is a multi-year list that will change as issues and concerns arise. Increases in staffing and funding levels may also allow more activities to be completed. Accomplishments and desired outcomes will be 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, and as public issues and concerns change. Plan updates will address these changes.

1. The Colockum Wildlife Area performance measures in 2006 and 2007 include:

Yearly Activities:

- Maintain 35 miles of Wildlife Area boundary fence to exclude trespass livestock.
- Inspect and maintain 15 spring developments on the Wildlife Area.
- Inspect and maintain 25 upland bird feeders on the Wildlife Area.
- Maintain 180 acres of agricultural fields in the N. Fk. Tarpiscan in annual grain crops or forage grasses. Manage grass fields by mowing and fertilizing.
- Maintain 40 acres of existing meadows as forage areas in the Arthur Coffin Game Reserve (ACGR) by tree seedling removal and fertilization.
- Maintain green dot reader boards and road markers on 80 miles of road.
- Maintain signs (game reserve, no vehicle, entrance signs).
- Remove litter from campsites, roadsides. Remove permanent structures.
- Control weeds along roads, campsites, parking areas, agricultural fields, boat launch, equipment storage areas.
- Maintain headquarters facility, vehicles, equipment.
- Maintain contact with CAG (at least one meeting per year).
- Have staff attend annual pesticide recertification workshops.
- Provide annual first aid training to staff.
- Assist with annual wildlife surveys.
- Monitor grazing lease.
- Maintain roads (minor repairs).

2006

- Survey and fence property boundary between Colockum Wildlife Area and the private inholding in sections 8 and 16, T.20N, R.22E.
- Implement public use surveys with car counters and other methods.
- Review Naneum Green Dot map with agency staff, cooperators and CAG. Make changes due to resource damage concerns, road density goals, timber harvest activities, etc. Print updated maps and implement changes in the field.
- Develop restoration plans for springs.
- Inventory guzzlers on the Wildlife Area and develop maintenance plans.
- Assess habitat condition and trend of shrub steppe on the Wildlife Area. Establish monitoring plots to document cover and frequency of plant species.

- Inventory plant species on the Wildlife Area and develop a plant list.
- Assess CRP fields for further weed control and restoration needs.
- Plan timber harvests to create additional meadows in the ACGR.
- Complete timber thinning project on S. Fork Colockum Creek. Seed disturbed areas.
- Develop GIS-based Green Dot Road Management maps for distribution to public.
- Install "Green Dot Area Regulations" signs at all entrances.
- Design and install road name signs at major road junctions.
- Complete red card training by Wildlife Area staff.
- Complete Wildlife Area plan, weed plan, fire plan, and annual RMAP report.

2007

- Open 15 miles of stream by removing fish passage barriers (culverts).
- Implement winter closure to motorized vehicles (Jan. 1 – May 1) on winter range. Build and install gates where effective.
- Assess fish species composition and relative abundance on all streams of the Colockum W.A.
- Remove artificial ponds and diversions in Brushy and Tekison Creeks, route water back to stream channel.
- Assess the need for winter closure to motorized vehicles (from start of winter feeding to May 1) on winter range.
- Implement permanent road closures in Tekison Creek and Stray Gulch.
- Create new vehicle camping areas to compensate for those lost in Tekison and Stray Gulch.
- Place barriers in primitive camping areas along Brushy and Tekison Creek to limit access by vehicles.
- Restore riparian habitat along creeks in Tekison and Stray Gulch with grass, tree and shrub plantings.
- Complete 13 road projects as part of an RMAP.
- Implement prescribed burning treatments on S. Fk. Colockum Creek and Jump-off Ridge timber thinning projects.
- Map ESA species and habitats in GIS for the Wildlife Area.
- Grade and repair 4 miles of the Tarpiscan Road, 5 miles of the Brewton Road, and 7 miles of the Brushy Road.

2. Annual Evaluation of Performance.
Evaluate performance measures and produce an annual report. At the beginning of each calendar year, the manager will convene the CAG and district team to assess wildlife area specific performance measures and accomplishments that will be used to develop the annual plan update. This update will be an attachment to the plan.

3. Annual Plan Update.
As projects are completed and new issues arise, this plan will be updated, without needing to be re-written. With CAG and District Team input, the plan will continually reflect the strategies, goals and objectives of the current year.

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, ways weeds 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.
- Hit on user groups for help in outreach and projects.
- Many noxious weeds are spread by both domestic and wild animals.
- Prepare an integrated weed management plan.
- Comment reinforcing the need for re-vegetation efforts once weeds are under control, and encouraging more of that 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 that staff doesn't see regularly.
- 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.
- Existing emphasis on weed control is good and should continue.
- Feed for pack animals should not have to be certified because Washington State doesn't have any certified feed for animals.

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.
    - -Off road vehicles, mudders, hill climbs, campfires, target shooting (safety issue), littering, damage to elk fence.

- Find new, more effective methods such as aerial reconnaissance, tell public how to report a violation (give them a phone number).
- 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.
  - Use monitoring to focus efforts; determine objectives for monitoring.
  - Identify key areas of public use.
  - Consider how to use local knowledge.

- **Winter Range Protection:**
  - If areas need to be closed seasonally to protect elk, then WDFW should do it.
  - Regulate public access in big game wintering areas. Seasonally close roads, snowmobile use etc.
  - Too many elk are being pressured (particularly in late winter/early spring) by 4-wheelers and other ATVs. Example: Bruton Road on Colockum W.A. How do we change that, enforce it, and improve the situation for elk?
  - Comment that the degree to which a seasonal closure or restriction is needed has to be established. DFW 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?
  - Comment that this relates directly to elk depredation in the Kittitas Valley, and can mean weighing recreational opportunity (legal or not) against economic loss to the agricultural community.
  - Discussion on closure options; vehicle closure only versus closure to access of any kind.
  - 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.
  - 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.
  - Consensus that, public outreach is needed to help fight mudding and other illegal practices like chasing elk.
  - Comment that USFS regulations vs. DFW, County, other State, etc. can be a problem, particularly with ATVs (different regulations are confusing).
  - Four-wheel clubs want to get involved in advocating legal use of the resources, and there is a need to reach out to them.
  - Winter range should be protected from all motorized vehicles not just snowmobiles.
  - The seasonal closure dates need to be set for public notice issues. No fluctuation depending on snow pack or other uncontrollable considerations.
  - The dates should be set considering spring turkey hunt dates or lift restrictions in turkey areas early.
  - Motorized users of summer range during the winter need legal access through winter range to access unrestricted areas.

- What is the definition of big game winter range? (Identified by OC Mgr. as elevations below 4500') Maintain legal motorized recreation access to areas above winter range, possibly by providing "pass-through" roads or corridors.
- WDFW should have ability to restrict recreation in certain areas during periods of critical use by wildlife (i.e. winter range).

- **Road Management:**
  - Most users on roads are hunters paying for licenses; they expect and deserve access.
  - Numerous hunters (he said most) want less roads to improve hunting and reduce the number of lazy road hunters.
  - Need for more Enforcement presence on the WAs. "You whack a few bad apples, and the word gets around."
  - Put up a reward of some sort for turning offenders in, like the points thing for hunters who do so.
  - Limit access to permit only.
  - 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.
  - Would hate to see the WAs become too restricted.
  - Conduct more surveillance by staff or hidden camera at problem spots; also more gates in key places.
  - Get volunteers (jeep club members and others) to work on some key spots (machinery and hand work) and routes. DFW staff needs do outreach for help.
  - We should we charge for Green Dot maps.
  - Solid data and evidence of resource damage, etc. is needed to back up decisions for closure.
  - Spend time with staff outlining things they need to document regularly when in the field. Get some data on paper, informal or not.
  - DFW shouldn't worry so much about pleasing everyone, just do what is right. Only 10% gripe about what DFW does for wildlife and habitat anyway.
  - Closing road A may only mean more traffic for road B, and that always needs to be a consideration.
  - Need more signage and education to explain road management practices.
  - Include rules and information with the new ATV paperwork at dealerships, educate to tread lightly, establish and enforce speed limits.
  - <u>Work with Forest Service to resolve differences in green dot versus green diamond road management.</u>
  - Work with adjacent land owners to consolidate road management systems. Restrictions are not consistent from one owner to the next. i.e. Forest Service bordering State Agencies.
  - Road closures on short/dead end stream adjacent roads
  - Disabled issues with closing to many roads, stream adjacent or not.
  - Buffer zones should not be prescribed settings, but on the discretion of conservation manager**.**
  - <u>Maintain/close roads to prevent impacts to water quality.</u>
  - <u>Green dot is a good road management system for the type of open country that we are dealing with.</u>

- When closing roads, use physical barriers where and when they can be effective.

- **Fences/Gates:**
  - 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:**
  - More signage and information needed on the sites where target shooting occurs to reduce littering and use of inappropriate targets (glass, TV's, washers/dryers).
  - Consensus that there is a need for more enforcement presence by DFW 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.
  - No laws that restrict shooting on the wildlife areas, but safety issues are real.
  - Look at creating backstops, formal ranges, or shooting restrictions.
  - CAG consensus suggested more outreach, and communication that the litter associated with these shooting areas is unacceptable. DFW needs to publicize, inform, and make people aware.

Issue C: Grazing

- Consensus that many riparian areas and degraded habitat should not be grazed, but recommended the agency use it as a tool where needed (with very strict controls imposed on it).
- Consensus 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.
- DFW 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 DFW 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.
- Do the managers decide whether or not it is appropriate to try?
- Comment that it can be bad PR to discourage grazing, and limits revenue generated by the agency.
- 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.
- Comments against exchanging summer range (timbered sections) for winter range (shrub steppe). Concerns start with logging techniques in summer range directly affecting the winter range. Higher elevations are the watershed for winter range. Under existing logging techniques the watershed will be depleted effecting big game, upland game, fish, and habitat. This is a conflict of WDFW mission statement.
- Need contingencies in the Land Swap for overhaul of timber management with conservation in mind.
- DNR has HCP's in partnership with Federal agencies to help keep conservation in mind. WDFW need similar programs between DNR/WDFW.
- Native seed only in future habitat restoration if possible.
- Add list of projects, long and short term, which volunteer organizations can access to help WDFW.
- Protect and restore PHS habitats.
- Restore shrub-steppe for sage grouse.
- Use appropriate tools to protect key habitats on private lands.

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 DFW lands and lower range, ag lands, protected areas.
- More spot hunts need to be organized, but in a better fashion. More communication with adjacent landowners, better coordination across ownerships.
- More farming and less CRP to relieve adjacent private landowners from Elk damage.

Issue G: Forest Management

- Statement made against DNR logging in the Naneum Basin and other areas on the Colockum W.A. 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 W.A. on WDFW land, and how that could be a revenue generator for getting other things done. All 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 W.A.s.
- Comment that if current thinnings were success stories, WDFW should get the word out, that we needed the good public relations stuff 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.
- Comment that WDFW needs to establish some clear criteria for timber practices on their lands.
- Comment that lodge pole pine stands needed to be treated differently, and when thinned dramatically took out the watershed. He cited two examples in the Wenatchee area.
- Suggestion that we relate our goals to past successful work, and work in progress.
- Keep forest land in Land Swap so WDFW can enhance timber stands and keep low impact on Colockum watershed.
- Look at stewardship contracts with companies to minimize cost for agencies to enhance timber stands in exchange for the timber taken off.
- Timber enhancement with snags made or left in stands is not only good for nesting birds but also for bats.

Issue H: Land Acquisition

- DFW needs to take better care of what we have.
- Acquire strategic, key habitats and land parcels.
- Discussion of related 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.
- Comment regarding use of conservation easements; key is landowner incentives to participate, whether that be in the form of tax breaks or what.
- Discussion on 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.
- Idea of incentive tags and or sale of access by other means.
- General feeling 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.
- Concern over the potential land swap between DFW and DNR, 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 DFW and DNR. Most felt cooperative management agreements are key to the successful stewardship of public lands.

Issue I: Commercial Use/Non-Renewable Resource Extraction

- Statement that 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.
- Comment that commercial use fees need to go back to the W.A.

- Promote it and the cost/benefit, and it can also be a tool to focus use where we want use.
- Question whether these fees limit use and reduce impact, or if there should be more restrictions on commercial use.
- CAG members wanted to know how much really gets to the W.A? Is it really fee for service? Group consensus that it should be.
- Someone stated/asked that some Wildlife Areas have the potential to make more money than others; should fee money go to the Wildlife Program and be distributed?
- Comment that we may need to be prepared to sacrifice some areas for undesirable uses. DFW 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 amongst 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, group consensus was 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. Strong group consensus that strict guidelines need to be established in the plan to define what is allowable, then DFW 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.
- Commercial land use of WDFW lands should be annually revised to raise leases in conjunction with land value. i.e. Mission Ridge.
- Commercial revenue should stay on site or at least in the lands program.

Issue J: Wildlife Releases:

- Comment on the wild turkey management plan. Individual not supportive of only planting birds where a population already exists. Individual felt that the economic benefit of more release sites would outweigh other factors.
- Comment that 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 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. All 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

- Incorporate individual herd plans in the Wildlife Area Plans, and an explanation of how surveys are conducted.
- Maintain bird feeding program.
- Reintroduce bird guzzler maintenance schedule.
- Facilities maintenance: Cooperate with other agencies for equipment use.
- Need to have subcommittees meeting periodically to look at Wildlife Area issues.

APPENDIX 2: COLOCKUM WILDLIFE 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).

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 Colockum W.A.
The list of weeds of concern is based on species that have been documented on the wildlife area (Table 1).

Table 3. Weeds currently growing on the Colockum Wildlife Area.

Weed Species	2005 State Weed Class	2005 County Weed Class	Wildlife Unit(s)	2005 Treated Acres
Canada thistle	C	C	Colockum	1
Cheat grass			Colockum	500
Dalmatian Toadflax	B-D	B-D	Colockum	3
Diffuse Knapweed	B	B	Colockum	100
Jointed goatgrass			Colockum	500
Musk Thistle			Colockum	20
Perennial pepperweed	B	B	Colockum	1
Purple Loosestrife	B	B	Colockum	0
Russian Knapweed	B	B	Colockum	20
Russian thistle			Colockum	180
Scotch thistle	B	B	Colockum	1
Spotted Knapweed	B	B-D	Colockum Colockum Colockum	0
White-top	C	C	Colockum	10
Yellow Star thistle			Colockum	1

B-D (B-Designate) is 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 County.

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.

Curtail (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 DISTRIBTUTION ON THE SITE
Canada thistle is found throughout the Colockum 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 Colockum 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 W.A. 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.

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 37degress 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 a 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, it fine structure, and it 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 reseeding, 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 (sethozydim), and Assure (quizalofop) are effective at controlling cheatgrass without harming 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 DISTRIBTUTION ON THE SITE
Cheatgrass is present throughout the Colockum Wildlife Area. It is especially prevalent in CRP and agricultural fields, degraded rangelands and in fire-prone areas such as West Bar.

ACRES AFFECTED BY WEED: 20,000 **WEED DENSITY:** low-high

GOALS
Decrease occurrence of cheatgrass on the Colockum 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 in 600 acres of CRP and agricultural fields by herbicide application, mowing and reseeding.

CONTROL SUMMARY AND TREND
Recent success has been achieved on the Wildlife Area using herbicides and mowing.

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
Colockum Wildlife Area. Found along the Columbia 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.

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 involucres 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 Kittitas County 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 DISTRIBTUTION ON THE SITE
Encompasses all the Colockum 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 Colockum 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
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.

JOINTED GOATGRASS CONTROL PLAN

Scientific name: *Triticum cylindricum* **Common name:** Jointed Goatgrass
Updated: 2006

DESCRIPTION

Jointed goatgrass is a winter annual grass with one to many erect stems or tillers. The leaves are alternate, 1/8 to ¼ inch wide, with hairs on the leaf margins and at the stem juncture. Jointed goatgrass grows from 15 to 30 inches tall. The flower structure of mature jointed goatgrass-referred to as a spikelet or a joint, is distinct. The outer spikelet glumes fuse together and enclose one to three seeds, giving the spikelet an appearance of a cylindrical joint. The seed head is long and narrow with two to twelve one half inch sections.

Jointed goatgrass generally emerges during cool weather, with peak emergence occurring from September through early November. A secondary flush of seedlings may emerge in late winter or early spring. Flowering occurs in May and seeds are produced in July. Jointed goatgrass normally produces anywhere from a few to more than 200 spikelets per plant with each spikelet containing one to three seeds. If growing without competition, jointed goatgrass can produce 3,000 seeds or more per plant. At maturity, the spikes separate into segments with part of the central stem or rachis attached. Jointed goatgrass seeds are relatively short-lived in the soil. One year after entering the seed bank, more than 80% of jointed goatgrass seeds are alive. Two years later, approximately 30% are alive, and by the third year, less than 5% of the original populations of jointed goatgrass seeds remain alive.

Jointed goatgrass is a close relative to winter wheat and is sometimes spread by contaminated wheat seed. This close genetic relationship can result in crosses to form hybrids that are intermediated in form. Hybrid seed was once thought to be sterile, but recent studies show that some of the hybrid seed is fertile and will produce viable offspring. In the vegetative stage jointed goatgrass looks very similar to wheat and often goes unnoticed. In harvested grain, the spikelets (rachis segment with seeds, joints) are often confused with broken pieces of straw. Jointed goatgrass competes with the crop for soil nutrients, sunlight, nitrogen and soil moisture. Besides crop fields, jointed goatgrass is also found along roadsides, waterways, and fence lines. It usually occurs in isolated patches but may also infest an entire field.

In Kittitas County jointed goatgrass is a state-listed class B noxious weed.

MANAGEMENT INFORMATION

Jointed goatgrass management in winter wheat is difficult because the genetics and growth patterns of these two species are similar. Early detection and prevention is critical with goatgrass since it is easily overlooked until it has become very well established. Isolated occurrences and small patches can be effectively controlled by hand pulling or mowing before seed production. Larger infestations that occur in grain fields can be reduced by; rotating crops, using spring tillage and spraying non-selective grass herbicides. Other herbicides are currently being developed that will kill selectively kill jointed goatgrass in winter wheat without harming the crop. On CRP (Conservation Reserve Program) area and rangeland sites on the Colockum W.A., several other herbicides are being tested that show promise in controlling annual grass weeds such as jointed goatgrass without harming perennial plants such as bluebunch wheatgrass, Idaho fescue, big sagebrush and others.

CURRENT DISTRIBTUTION ON THE SITE
On the Colockum jointed goatgrass has invaded many of the agricultural fields on the Wildlife Area. It has infested the Tarpiscan fields, which are currently farmed in wheat and triticale. Goatgrass has also severely infested the Cape Horn and Brushy fields that were enrolled in the CRP program and seeded to native plants in 1997 and 1998.

ACRES AFFECTED BY WEED: 1200 **WED DENSITY:** med-high

GOALS
Decrease occurrence of jointed goatgrass on the Colockum Wildlife Area, including agricultural fields, CRP and rangelands.
Increase quality of CRP and rangeland plant communities by controlling jointed goatgrass.

OBJECTIVE
Survey and map existing jointed goatgrass infestations.
More accurately calculate the acres affected by jointed goatgrass.
Reduce jointed goatgrass densities by using an integrated weed management approach.
Rehabilitate degraded non-crop areas with competitive native plants.

ACTIONS PLANNED
Continue trial herbicide applications on CRP fields.
Use crop rotations, spring grains and herbicide-resistant wheat to reduce goatgrass in the Tarpiscan Ag. fields.

CONTROL SUMMARY AND TREND
Jointed goatgrass control has been ongoing on the Colockum Wildlife Area since 1999. Several CRP fields in the Brushy area were double-fallowed and replanted to reduce goatgrass with little success. Recent experiments with several herbicides are showing promising results.

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 Kittitas County.

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 DISTRIBTUTION ON THE SITE

Encompasses all the Colockum 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: 1,000 **WEED DENSITY:** Low

GOALS
Decrease occurrence of musk thistle on the Colockum 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 a 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
Musk thistle is becoming an increasing problem on the Wildlife Area, especially in forested areas that are seeing extensive logging activities. Musk thistle has appeared in recently planted CRP fields and is being aggressively controlled.

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 weed in Kittitas 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 DISTRIBTUTION ON THE SITE
On the Colockum Wildlife Area perennial pepperweed is found along steams, 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: 50 **WEED DENSITY:** Low

GOALS
Decrease occurrence of perennial pepperweed on the Colockum 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
Perennial pepperweed is controlled as it is encountered while treating other weeds such as whitetop and Russian Knapweed. Some progress has been made but the best chance for effective control will be when biological control agents become available.

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 magneta-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 weed in Kittitas County.

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 DISTRIBTUTION ON THE SITE
On the Colockum Wildlife Area purple loosestrife is common along the banks of the Columbia River. It has also been found in the riparian areas along the major creeks and streams of the area, and around springs and ponds.

ACRES AFFECTED BY WEED: 500 **WEED DENSITY:** Low

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

OBJECTIVE
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
Purple loosestrife is common along the Columbia River on the Colockum Wildlife Area, but has not formed large colonies. This is most likely due to the effects of the *Galerucella* beetle and some careful herbicide applications. Herbicide applications are currently not being made by Wildlife Area staff in order to allow *Galerucella* beetles a chance to succeed.

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 (glysophate) 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 DISTRIBTUTION ON THE SITE

Found throughout the Colockum Wildlife Area from low to mid elevations in riparian zones, meadows and agricultural fields.

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

GOALS

Decrease occurrence of Russian knapweed on the Colockum 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 reseeding where possible.
Research new advances in biological control of Russian knapweed.

CONTROL SUMMARY AND TREND
Control has slowly reduced the number of acres affected by Russian knapweed on the Colockum W.A. 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. These round, thorny plants are 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 Kittitas County.

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 Colockum 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 DISTRIBTUTION ON THE SITE
Found throughout the Colockum Wildlife Area, at elevations generally below 4000 feet. Commonly found along roads, in the Tarpiscan agricultural fields, the Cape Horn and Brushy CRP (Conservation Reserve Program) fields, and in degraded rangeland.

ACRES AFFECTED BY WEED: 2000 **WEED DENSITY:** Low-medium

GOALS
Decrease occurrence of Russian thistle on the Colockum 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 in the Tarpiscan fields and in the Cape Horn and Brushy CRP fields 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.

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 inhibiter 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 noxious weed in Kittitas County. It is a fairly recent invader of the county and a high priority for control.

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 DISTRIBTUTION ON THE SITE
Scotch thistle has only occasionally been found on the Colockum Wildlife Area. Several plants were found in the Tekison Creek drainage at the Stray Gulch junction, and these plants were eradicated. Scotch thistle is present in larger populations in the Colockum Creek drainage and presents a danger of spread to the Wildlife Area.

ACRES AFFECTED BY WEED: Less than 50 **WEED DENSITY:** Low

GOALS

Keep the Colockum Wildlife Area free of scotch thistle.
Reduce spread of Scotch thistle from adjacent lands.

OBJECTIVE
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
In 2006, weed surveys will continue and any plants found will be eradicated.

CONTROL SUMMARY AND TREND
2002: Several plants found in Tekison Creek and eradicated.
2003: Tekison Creek monitored for more plants.
2004: Tekison Creek monitored for more plants.
2005: No plants noted.

Scotch thistle has not yet become established on the Wildlife Area. Plants are present on neighboring lands and will probably spread.

SPOTTED KNAPWEED CONTROL PLAN

Scientific name: *Centaurea malculosa* **Common name:** Spotted knapweed
Updated: 2006

DESCRIPTION: Spotted knapweed is a short-lived, perennial herb, 1-3 feet tall. It reproduces from seed and forms a new shoot each year from a taproot. Like diffuse knapweed, it is a native to central Europe. It can be distinguished from its close relative diffuse knapweed by the lack of a terminal spine at the tip of its bracts. Flowers are pinkish-purple or rarely cream colored. Spotted knapweed seeds germinate in spring or fall. The seedlings develop into and remain as rosettes for at least one growing season while root growth occurs. It usually bolts in May of its second growing season and flowers August through September. It is a prolific seed producer, and can produce up to 140,000 seeds/m2. Seeds may remain viable in the soil for over 8 years. Seeds are spread by wind, with most seeds being shed immediately after reaching maturity.

Spotted knapweed is a highly competitive weed that invades disturbed areas and degrades desirable plant communities. It is found in light, porous soils, fertile, well-drained and often calcareous soils in warm areas. It occupies dry meadows, pastureland, stony hills roadsides and sandy or gravelly floodplains of streams and rivers. Spotted knapweed tolerates dry conditions, similar to diffuse knapweed, but survives in higher moisture areas as well, preferring areas that receive 12 to 30 inches of annual precipitation. Like diffuse knapweed, spotted knapweed has been reported to contain cnicin, an allelopathic chemical. Cnicin inhibits root growth of other plants, and destroys their ability to compete for limited soil moisture and nutrients.

Spotted knapweed is a state-listed class B weed. In Kittitas County it has spread rapidly through many areas of the upper county and is now showing up in the lower county as well.

MANAGEMENT INFORMATION:
Spotted knapweed can be managed similarly to diffuse knapweed. It is readily controlled with herbicides such as Tordon, Transline, Banvel or Clarity. One pint/A. of Tordon will control spotted knapweed for two to three years, but the weed will reinvade the area unless other management techniques are used. As with diffuse knapweed, seeding competitive, desirable native plant species after control of spotted knapweed is required to prevent reinvasion.

Hand pulling and mowing can reduce spotted knapweed densities but is labor intensive and not suited to large infestations. Seed production must be prevented for many years to prevent reestablishment. Similarly to diffuse knapweed, several insects have been found to be effective as biological control agents for spotted knapweed. These include seedhead flies (*Urophora, spp*.) a root-feeding beetle (*Cyphocleonus achates*), and several seedhead weevils (*Bangasternus and Latrines* spp.) The larvae of the yellow-winged knapweed moth (*Agapeta zoegana*) feeds in the roots of both knapweed species.

CURRENT DISTRIBTUTION ON THE SITE
Across the Colockum Wildlife Area, but infestations are not as severe as diffuse knapweed. Found in higher precipitation, higher elevation sites.

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

GOALS
Decrease occurrence of spotted knapweed on the Colockum Wildlife Area.
Increase quality of infested plant communities.

OBJECTIVES
Survey and map existing spotted knapweed populations.
More accurately calculate the acres affected by spotted knapweed.
Reduce spotted 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.
Continue release of biological control insects across the Wildlife Area.

CONTROL SUMMARY AND TREND
Spotted 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. Insect releases (*Larinus)* have reduced knapweed densities but more releases of a variety of insects is needed.

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 DISTRIBTUTION ON THE SITE

Found on the Colockum Wildlife Area at low to mid elevations in riparian zones, agricultural fields, old homestead areas and roadsides.

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

GOALS

Decrease occurrence of White top on the Colockum 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

Whitetop populations have been somewhat reduced by herbicide treatments in some areas.
Infestations need continued work to keep them form spreading.

YELLOW STAR-THISTLE CONTROL PLAN

Scientific name: *Centaurea solstitalus* **Common name:** Yellow Star-thistle
Updated: 2006

DESCRIPTION: Yellow star-thistle is a gray-green to blue-green, winter annual plant with a vigorous taproot. It produces bright, dandelion like yellow flowers with sharp spines surrounding the base. The stems are rigid, branching, covered with a cottony fiber, and vary from 6 inches to 3 feet. Basal leaves are 2 to 3 inches long and deeply lobed. The upper leaves are not lobed and are small and sharply pointed.

Yellow star-thistle seeds germinate in the fall through spring, depending on moisture. Seed output can be as high as 29,000 seeds per square meter, with about 95 percent of the seed being viable. Most seed germinate the following year, but some can last 10 years or more in the soil. After germination, the plant initially allocates most of its resources to root growth. By late spring, roots can extend 3 feet or deeper into the soil profile although the portion above ground is a relatively small basal rosette. This allows yellow star-thistle to out compete shallow rooted annual species during the drier summer months. This also allows it to survive well into the summer long after other annual species have dried up. Yellow star-thistle bolts in late spring and flowers June through August.

Yellow star-thistle invades rangelands, pastures, roadsides, croplands and wastelands. It is intolerant of shade and requires light on the soil surface for winter rosette and taproot development. Yellow star-thistle is capable of establishing on deep, well drained soils as well as shallow, rocky soils that receive from 10 to 40 inches of annual precipitation. In the Pacific Northwest, yellow-star thistle favors sites that were formally dominated by big sagebrush, bluebunch wheatgrass, Idaho fescue and sand berg bluegrass.

Yellow star-thistle causes a neurological disease (nigropallidal encephalomalacia) in horses that eat it.

MANAGEMENT INFORMATION:
Properly managed ranglelands and riparian areas resist invasion by yellow starthistle. In lightly infested areas hand pulling, mowing and grubbing can be effective.Cultivation can also effectively control seedlings of yellow starthistle. Repeated cultivations are needed to control each new flush of seedlings. Chemicals that will control yellow starthistle include 2,4-D, picloram, dicamba, and triclopyr. Conrol is more effective in the rosette stage. Once the plant begins to bolt it becomes more tolerant to chemicals. A good surfactant is recommended to enhance herbicide penetration.

CURRENT DISTRIBTUTION ON THE SITE
Yellow starthistle is found only in the Tarpiscan Creek drainage on the Wildlife Area.

ACRES AFFECTED BY WEED: 80 **WEED DENSITY:** Low

GOALS
Decrease occurrence of yellow starthistle on the Colockum Wildlife Area.
Increase quality of infested plant communities.

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

ACTIONS PLANNED
Continue working with the Kittitas County Noxious Weed Control Board to inventory and spot spray any plants founds.

CONTROL SUMMARY AND TREND
Since 2001 WDFW has been working cooperatively with the Kittitas County Noxious Weed Control Board to inventory and control yellow starthistle in the Tarpiscan Creek drainage. This effort has been very successful but there are still a few plants found each year and control will continue to try to eradicate it from the Wildlife Area.

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. 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: 5,000 **WEED DENSITY**: Low-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 weed 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 residential areas.

CONTROL SUMMARY AND TREND
Roadside and access management have required a consistent, yearly maintenance effort.

Table 4. 2005 Kittitas County Noxious Weed List

For more information on a specific weed, please visit the Washington State Noxious Weed Control Board.

Class A Noxious Weeds

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

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	*Bertero aincang*
Arrowhead, grass-leaved	*Sagittaria graminea*
Blackgrass	*Alopecurus myosuroides*

Blueweed	*Echium vulgare*
Broom, Scotch	*Cytisus scoparius*
Bryony, white	*Bryonia alba*
Bugloss, annual	*Anchusa arvensis*
Bugloss, common	*Anchusa officinalis*
Camelthorn	*Alhaga maurorum*
Carrot, wild	*Daucus carota*
Catsear, common	*Hypochaeris radicata*
Chervil, wild	*Anthriscus sylvestris*
Cinquefoil, sulfur	*Potentilla recta*
Cordgrass, common	*Spartina anglica*
Cordgrass, smooth	*Spartina alterniflora*
Daisy, oxeye	*Leucanthemum vulgare*
Elodea, Brazilian	*Egeria densa*
Fanwort	*Cabomba caroliniana*
Fieldcress, Austrian	*Rorripa austriaca*
Floating heart, Yellow	*Nymphoides peltata*
Gorse	*Ulex europaeus*
Hawkweed, mouseear	*Hieracium pilosella*
Hawkweed, orange	*Hieracium aurantiacum*
Hawkweed, polar	*Hieracium atratum*
Hawkweed, queendevil	*Hieracium glomeratum*
Hawkweed, smooth	*Hieracium laevigatum*
Hawkweed, yellow	*Hieracium caespitosum*
Hedge parsley	*Torillis arvensis*
Helmet, policeman's	*Impatiens glandulifera*
Herb-Robert	*Geranium robertianum*
Houndstongue	*Cynoglossum officinale*
Indigobush	*Amorpha fruiticosa*
Knapweed, black	*Centaurea nigra*
Knapweed, brown	*Centaurea jacea*
Knapweed, diffuse	*Centaurea diffusa*
Knapweed, meadow	*Centaurea pratensis*
Knapweed, Russian	*Acroptilon repens*
Knapweed, spotted	*Centaurea maculosa*
Knotweed, Bohemian	*Polygonum bohemicum*
Knotweed, giant	*Polygonum sachalinense*
Knotweed, Himalayan	*Polygonum polystachyum*
Knotweed, Japanese	*Polygonum cuspidatum*
Kochia	*Kochia scoparia*
Lepyrodiclis	*Lepyrodiclis holosteoides*
Loosestrife, garden	*Lysimachia vulgaris*

Loosestrife, purple	*Lythrum salicaria*
Loosestrife, wand	*Lythrum virgatum*
Nutsedge, yellow	*Cyperus esculentus*
Oxtongue hawkweed	*Picris hieracioides*
Parrotfeather	*Myriophyllum aquaticum*
Pepperweed, perennial	*Lepidium latifolium*
Primrose, water	*Ludwigia hexapetala*
Puncturevine	*Tribulus terrestris*
Ragwort, Tansy	*Senecio jacobaea*
Saltcedar	*Tamarix ramosissima*
Sandbur, longspine	*Cenchrus longispinus*
Skeletonweed, rush	*Chondrilla juncea*
Sowthistle, perennial	*Sonchus arvensis*
Spurge, leafy	*Euphorbia esula*
Spurge, myrtle	*Euphorbia myrsinites L.*
Starthistle, yellow	*Centaurea solstitialis*
Swainsonpea	*Sphaerophysa salsula*
Thistle, musk	*Carduus nutans*
Thistle, plumeless	*Carduus acanthoides*
Thistle, Scotch	*Onopordum acanthium*
Toadflax, Dalmatian	*Linaria dalmatica*
Watermilfoil, Eurasian	*Myriophyllum spicatum*

Class C Noxious Weeds

Common Name	Scientific Name
Babysbreath	*Gypsophila paniculata*
Bindweed, field	*Convolvulus arvensis*
Cockle, white	*Silene latifolia*
Cocklebur, spiny	*Xanthium spinosum*
Cress, hoary	*Cardaria draba*
Dodder	*Cuscuta approximata*
Goatgrass, jointed	*Aegilops cylindrica*
Groundsel, common	*Senecio vulgaris*
Hawkweed, non-native species	*Hieracium spp.*
Henbane, black	*Hyoscyamus niger*
Iris, yellow flag	*Iris pseudocorus*
Mayweed, scentless	*Matricaria perforata*
Old man's beard	*Clematis vitalba*
Poison-hemlock	*Conium maculatum*
Reed, common, non-native	*Phragmites australis*
Spikeweed	*Hemizonia pungens*
St. Johnswort, common	*Hypericum perforatum*

Tansy, common	*Tanacetum vulgare*
Thistle, bull	*Cirsium vulgare*
Thistle, Canada	*Cirsium arvense*
Toadflax, yellow	*Linaria vulgaris*
Water lily, fragrant	*Nymphaea odorata*
Whitetop, hairy	*Cardaria pubescens*
Wormwood, absinth	*Artemisia absinthium*

APPENDIX 3: FIRE MANAGEMENT PLAN

Fire Control Plan

Responsible Fire-Suppression Entities: Approximately 2/3 of the Colockum Wildlife Area are non-forested, grassland and shrub-steppe lands that are included in a fire suppression agreement between the WA. Dept. of Fish and Wildlife (WDFW) and the WA. Dept. of Natural Resources (WDNR). This is not a guaranteed response contract but does provide a mechanism for DNR response. The agreement also clarifies the two agencies' roles and provides for payment of suppression costs.

Approximately 1/3 of the Colockum Wildlife Area is made up of forested habitats. Ponderosa pine, Douglas fir, lodgepole pine, western larch and other species make up these forest types at the higher elevation on the Wildlife Area. Most of the forested lands on the Wildlife Area are within the State Fire Protection Boundary. Wildfire suppression within this boundary is performed by WDNR. WDFW pays an assessment fee for each acre within the fire protection boundary for these services.

The Chelan County Fire District (CCFD) also responds to fires on the Colockum Wildlife Area. A portion of the Wildlife Area on its northern boundary is located within Chelan County Fire District #2 and includes the Wildlife Area headquarters facilities. CCFD will respond to structure fires, with the nearest fire station at Malaga approximately 10 mile away. CCFD has indicated they will also continue to respond to wildfires on the Colockum Wildlife Area if requested by WDFW. Suppression costs for wildland fires are covered on a "pay as you go" basis.

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 Colockum 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 obligates (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 mule deer 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 the Colockum 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 Colockum Wildlife Area to the local fire district, WDNR, 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.

Fire Districts – DIAL 911

NAME	TELEPHONE	CELL
Chelan County Fire District #1	509-662-4734	

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.

DEPARTMENT OF FISH AND WILDLIFE - contact in order listed

Contact	**Radio Number**	**Contact Number**	
Pete Lopushinsky, Wildlife Area Manager	Wildlife 422	509-663-6260	Work #
		509-663-5407	Home #
		509-670-0221	Cell #
Eric Chase, Habitat Technician	Wildlife 437	509-663-6260	Work #
Ted Clausing, Regional Program Manager	Wildlife 539	509-457-9313	Work#
		509-965-2860	Home#
		509-952-8990	Cell #
Regional Office – Yakima		509-575-2470	Office #
Wenatchee District Office		509-662-0452	Office #

APPENDIX 4: WATER RIGHTS

Table 5. Colockum Water Rights.

Location	File #	Person	Doc	Priority Dt	Purpose	Qi	UOM	Qa	Ir Acres	TRS	QQ/Q	Src's	1stSrc	Com
Colockum WA	S4-046044CL	WN ST DEPT GAME	Claim L		ST		CFS			19.0N 22.0E 09		1	SUMAC SPRING	
Colockum WA	S4-046045CL	WN ST DEPT GAME	Claim L		ST		CFS			19.0N 22.0E 11		1	COLLINS SPRING	
Colockum WA	S4-110723CL	DEPT OF GAME	Claim L		ST		CFS			19.0N 22.0E 22		1	SPRING	
Colockum WA	S4-115631CL	DEPT OF GAME	Claim L		ST		CFS			19.0N 22.0E 22		1	SPRING	
Colockum WA	S4-110722CL	DEPT OF GAME	Claim L		ST		CFS			19.0N 22.0E 33		1	SPRING	
Colockum WA	S4-110724CL	DEPT OF GAME	Claim L		ST		CFS			19.0N 22.0E 34		1	SPRING	
Colockum WA	S4-110725CL	DEPT OF GAME	Claim L		ST		CFS			19.0N 22.0E 35		1	SPRING	
Colockum WA	S4-046039CL	WN ST DEPT GAME	Claim L		ST		CFS			20.0N 20.0E 11		1	SHEEP SPRING	
Colockum WA	S4-046043CL	WN ST DEPT GAME	Claim L		DG		CFS			20.0N 20.0E 13		1	UNNAMED SPRING	
Colockum WA	S4-046042CL	WN ST DEPT GAME	Claim L		ST		CFS			20.0N 20.0E 15		1	UNNAMED SPRING	
Colockum WA	S4-046040CL	WN ST DEPT GAME	Claim L		ST		CFS			20.0N 21.0E 09		1	UNNAMED SPRING	
Colockum WA	S4-046034CL	WN ST DEPT GAME	Claim L		ST		CFS			20.0N 22.0E 05		1	UNNAMED SPRING	
Colockum WA	S4-046033CL	WN ST DEPT GAME	Claim L		ST		CFS			20.0N 22.0E 35		1	UNNAMED SPRING	
Colockum WA	S4-046035CL	WN ST DEPT GAME	Claim L		ST		CFS			21.0N 20.0E 35		1	UNNAMED SPRING	TRS likely wrong
Colockum WA	S4-046041CL	WN ST DEPT GAME	Claim L		No ID		CFS			21.0N 20.0E 35		1	SPRING	TRS likely wrong
Colockum WA	S4-046036CL	WN ST DEPT GAME	Claim L		ST		CFS			21.0N 21.0E 29		1	UNNAMED SPRING	TRS likely wrong
Colockum WA	S4-046037CL	WN ST DEPT GAME	Claim L		ST		CFS			21.0N 21.0E 29		1	UNNAMED SPRING	TRS likely wrong
Colockum WA	S4-30348	WA DFW *	NewApp	4/30/1990	WL,ST	0.01	CFS			19.0N 22.0E 02		1	UNNAMED SPRING	

Colockum WA	S4-30346	WA DFW *	NewApp	4/30/1990	WL,ST	0.02	CFS		1	19.0N 22.0E 09		1	UNNAMED SPRING	
Colockum WA	S4-30347	WA DFW *	NewApp	4/30/1990	WL,ST	0.002	CFS			19.0N 22.0E 11		1	UNNAMED SPRING	
Colockum WA	S4-30345	WA DFW *	NewApp	4/30/1990	WL,ST	0.004	CFS			19.0N 22.0E 20		1	UNNAMED SPRING	
Colockum WA	S4-30344	WA DFW *	NewApp	4/30/1990	WL,ST	0.002	CFS			19.0N 22.0E 22		1	UNNAMED SPRING	
Colockum WA	S4-30343	WA DFW *	NewApp	4/30/1990	WL,ST	0.002	CFS		0.1	19.0N 22.0E 23		1	UNNAMED SPRING	
Colockum WA	S4-01287CWRIS	WA DFW	Cert	11/12/1964	WL,IR	1.7	CFS	60	15	19.0N 22.0E 27	SE/NE	1	QUILOMENE CREEK	
Colockum WA	S4-01288CWRIS	WA DFW	Cert	9/2/1964	WL	2	CFS			19.0N 22.0E 27	NW/SW	2	QUILOMENE CREEK	
Colockum WA	R4-01286CWRIS	WA DFW	Cert	7/10/1964	WL		CFS	7		19.0N 22.0E 27	NW/SW	2	QUILOMENE CREEK	

Abbreviations
ST- Stock water; QI-; UOM- Unit of meter / CFS – Cubic feet per second
QA- ; Ir Acres – Irrigated Acres; QQ/Q – Quarter Quarter section; Src's -

APPENDIX 5: MANAGEMENT PLAN COMMENTS & RESPONSES

Washington State Department of Fish and Wildlife (WDFW), February 2007

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

Comment Author	Organization	Location
Unknown	General public	Unknown
Bill White	Cattleman	Ellensburg

Comments received on the Colockum 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
	General Support	
Unknown	"This is for ALL plans. For past management plans, I would like to see what actually was accomplished during the period. Plans are nice. I planned to retire at 30. 30 years later I still have not. So what have you done with my tax money?"	Although the management plan does not specifically list accomplishments prior to the date of the plan, it does include a brief history of management activities in Chapter 2. Also, the weed control appendix includes control summary and trend information indicating some past weed control activities. The current wildlife area management plan will be updated annually. Updates, which will be posted on the agency web site, will include a report of key activities accomplished the previous year.
	Fish, Wildlife and Habitat	
Bill White	I reviewed the Citizen's Advisory Committee's comments referring to cattle grazing on WDFW lands. The input was very extensive but I found no place in the Management Plan where the recommendations were implemented. There is one grazing permit that was referred to and will be closely monitored and it also spoke about keeping trespass cattle out. The CAG made many suggestions about using cattle grazing as a management tool to enhance elk habitat. These recommendations/suggestions must have	The use of grazing to manipulate habitat will be scientifically evaluated as a management tool, along with other options available to resource managers. It may be used, if managers feel it is the best tool available to accomplish the desired objective(s). The current grazing lease on the Colockum is part of an effort to reduce elk use on adjacent private lands where there is a unique depredation problem.

	been overlooked. I'm wondering what is the purpose of creating a Citizen's Advisory Committee or even a Land's Advisory Committee if our suggestions are not taken seriously. A serious concern by managers was the private land depredation from elk. Private land owners have cattle and many non-native species they have introduced. It seems very clear that elk prefer some of these non-native species and also like to graze on young succulent grasses after cattle have grazed. If we plan on keeping the elk on WDFW lands we need to implement some of the tools the private sector uses to pull them onto private land. On a positive note at least one small parcel of land was included to continue planting grain for elk use. If this works on a small scale it will work on a larger scale. Cattle grazing can also greatly enhance elk forage palatability when used correctly. In fact an area in Oregon (Bridge Creek) the elk numbers went from 120 average animals per year to 1,191 average animals using cattle grazing to remove the "wolf" grass and allow new succulent grass to immerge in the spring. If grazing is not included in the management plan it will be very clear that the Citizen's Advisory Committee's suggestions are being completely ignored.	

APPENDIX 6: DOCUMENTS AND SPECIES ACCOUNTS INFLUENTIAL IN MANAGEMENT OF COLOCKUM WILDLIFE AREA

Status Reports

Bald eagle, 2001
Burrowing owl, draft 2004
Sage grouse, 1998
Washington ground squirrel, draft 2004
Northern leopard frog, 1999
Oregon spotted frog, 1997
Streaked horned lark, draft 2004

Recovery/Management Plans

Bald eagle, 1990, federal 1986
Deer, 1997
Oregon spotted frog, 1998
Sage grouse, 2004
Furbearers, 1987-93
Cougar, 1997
Elk, 1997
Ferruginous hawk, 1996
Waterfowl, 1997
Upland birds, 1997

Game Management Plans

Volume III – Amphibians and Reptiles, 1997

Columbia spotted frog
Oregon spotted frog
Northern leopard frog
Striped whipsnake

Volume IV – Birds, 2003

American white pelican
Bald eagle
Black-backed woodpecker
Blue grouse
Burrowing owl
Cavity-nesting ducks
Chukar
Common loon
Flammulated owl
Golden eagle
Great blue heron
Harlequin duck
Lewis' woodpecker
Loggerhead shrike
Mountain quail
Northern goshawk
Peregrine falcon
Pileated woodpecker
Prairie falcon
Ring-necked pheasant
Sage sparrow
Sage thrasher
Sharp-tailed grouse
Shorebirds
Vaux's swift
Wild turkey
White-headed woodpecker

Volume V – Mammals

(Currently in development)

Management Recommendations for Washington's Priority Habitats and Species

May 1991

Bighorn sheep
Deer
Cougar
Migratory Birds (e.g., Mourning Dove)
Wild Turkey
Osprey
Elk
Bighorn Sheep
Waterfowl
Pygmy shrew

Rocky Mountain mule deer
Townsend's big-eared bat
Furbearers (e.g., beaver)
Unclassified Species (e.g. coyote)
Yellow-billed cuckoo
Upland Game Birds
Small game (e.g., rabbits)
White-tailed deer

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

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

WDFW policies and procedures (http://wdfw.wa.gov/depinfo/strat_goals_obj.htm)

Priority Habitat and Species List (http://wdfw.wa.gov/hab/phslist.htm)

Priority Habitat and Species Recommendations (http://wdfw.wa.gov/hab/phsrecs.htm)

Western Regional Climate Center (wrcc@dri.edu)