

# **SAGEBRUSH FLAT WILDLIFE AREA MANAGEMENT PLAN**

Washington Department of Fish and Wildlife



Prepared by Assistant Wildlife Area Manager, Dan Peterson



**2006**

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# **Washington State Wildlife Area Plan**

## **SAGEBRUSH FLAT WILDLIFE AREA**

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

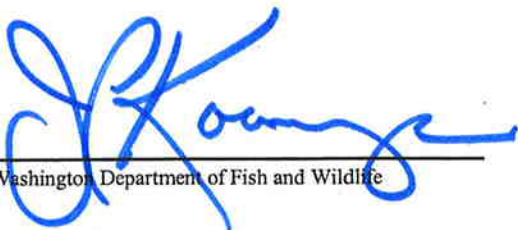
# Washington State Wildlife Area Plan

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Wildlife Program  
600 Capitol Way North  
Olympia, WA 98501-1091

Prepared by:  
Dan Peterson

November 2006



Director, Washington Department of Fish and Wildlife

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## EXECUTIVE SUMMARY

The Sagebrush Flat Wildlife Area (12,460 acres) located in Douglas County, was approved as a wildlife mitigation project in 1992 and was re-approved for operations and maintenance funding in 2006 as part of the Northwest Power Planning Council's (NWPPC) Provincial /Sub-basin Planning Process. This project is located within the Columbia Plateau Province (Upper Middle Columbia Subbasin) and partially addresses adverse impacts caused by the construction of Chief Joseph and Grand Coulee hydroelectric dams. Since 1991 ten separate purchases have contributed land to the SFWA. The most recent purchases occurred in 2005. Four separate units comprise the wildlife area: Sagebrush Flat, Dormaier, Chester Butte and Bridgeport.

The SFWA is predominantly shrubsteppe habitat. This habitat is essential to the survival of three listed species: Pygmy rabbit, Greater sage grouse and Columbian sharp-tailed grouse. These species occur year-round on the Wildlife Area. The Area's units are within the management and recovery zones for each. Population augmentation efforts for the Columbian sharp-tailed grouse have occurred on the area since 2005. Captive raised Pygmy rabbits have been released on to the area in 2007. This will mark its return to Washington after being extirpated in 2002. Wildlife habitat protection and enhancement efforts have been underway since 1995. In the past 12 years WDFW has converted 400 acres of old agricultural fields to native vegetation, planted 10-15,000 trees and shrubs, built sediment control structures in West Foster Creek, and performs annual weed control.

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

- Protecting and enhancing the areas shrubsteppe habitat.
- Increasing the quality and quantity of shrubsteppe habitat.
- Managing to promote the recovery pygmy rabbits, sharp-tailed grouse and sage grouse.
- Converting former agricultural fields and disturbed sites to native shrubsteppe habitat.
- Controlling noxious weeds.
- Protecting and enhancing riparian habitat.
- Managing for species diversity including shrubsteppe obligates plus state listed species.

In 2006 WDFW began and continued efforts to convert/restore 265 acres of former agricultural fields to native shrubsteppe habitat. Staff planted several thousand trees and shrubs in the West Foster Creek riparian corridor, treated nearly 250 acres to control/reduce noxious weeds and released 2,500 bioagents to help control/reduce the noxious weed Dalmatian toadflax. In April, WDFW released ten Columbian sharp-tailed grouse on the Bridgeport Unit.

2007 will see continued work on our restoration of old agricultural fields. Other major activities will include weed control, planting riparian trees and shrubs, removal of dilapidated interior fences and mundane administrative tasks.



## CHAPTER I. INTRODUCTION

This plan provides management direction for the Sagebrush Flat Wildlife Area (SFWA). It identifies needs and guides activities on the area based on the agency mission and statewide goals and objectives applied to local conditions. Annual updates will maintain its value as a flexible working document.

### 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 and wildlife-related recreational and commercial opportunities.

### 1.2 Agency Goals and Objectives

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

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

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

#### Goal II: Sustainable fish and wildlife-related opportunities

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

#### Goal III: Operational Excellence and Professional Service

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

### 1.3 Agency Policies

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

- Commission Policy 6003: Domestic Livestock Grazing on Department Lands
- Policy 6010: Acquiring and disposing of real property
- Policy 5211: Protecting and Restoring Wetlands: WDFW Will Accomplish Long-Term Gain of Properly Functioning Wetlands Where Both Ecologically and Financially Feasible on WDFW-Owned or WDFW-Controlled Properties
- Policy 5001: Fish Protection At Water Diversions/Flow Control Structures  
And Fish Passage Structures
- Policy: Recreation management on WDFW Lands
- Policy: Commercial Use of WDFW Lands
- Policy: Forest Management on WDFW Lands
- Policy: Weed Management on WDFW Lands
- Policy: Fire Management on WDFW Lands
- Contract: Bonneville Power Administration Project Number 199404400

### 1.4 Sagebrush Flat Wildlife Area Goals

Management goals for the Sagebrush Flat 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. These goals are driven by the need for the Bonneville Power Administration to mitigate for habitat losses caused by the construction of Grand Coulee and Chief Joseph hydroelectric dams. Specific management goals and objectives for the Sagebrush Flat Wildlife Area can be found in Chapter 3. Public participation, in the form of a Citizens Advisory Group (CAG), is encouraged as a means to identify natural resource, social, cultural, and economic issues important to the people of north central Washington.

### **1.5 Planning Process**

Statewide goals and objectives listed above shape management priorities on wildlife areas. Individual wildlife area information including why the area was purchased, habitat conditions, species present, and public issues and concerns are evaluated to identify specific wildlife area activities or tasks.

A Citizens Advisory Group (CAG) was established to bring public input, ideas and concerns to wildlife area management. 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 for each interest group/entity. CAG members will serve as spokespersons for their interest group/entity.

#### **Sagebrush Flat Wildlife Area Citizens Advisory Group**

Jim McGee	Public Utilities District No. 1 of Douglas County
Paul Fielder	Public Utilities District No. 1 of Chelan County
Bill Stegeman	Wenatchee Sportsmen's Association
Bob Fischer	US Army Corp of Engineers – Chief Joseph Dam/ Adjacent Landowner /Recreationist
Tim Behne	Adjacent Land Owner/Cattleman/Wheat Grower/Foster Creek Conservation District
John Musser	Wildlife Biologist, Recreationist
Steve Wetzel	Washington Department of Natural Resources
Mary Hunt	Douglas County Commissioner
Terry Nouka	Chelan County Weed Board
Jon Soest	North Central Washington Audubon Society
Nancy Warner	The Nature Conservancy
Gordon Congdon	Chelan - Douglas Land Trust
Mallory Lenz	U.S. Forest Service
Bob Stoll	Adjacent Land Owner and Member of Lands Management Advisory Council
Neal Hedges	US Bureau of Land Management

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.

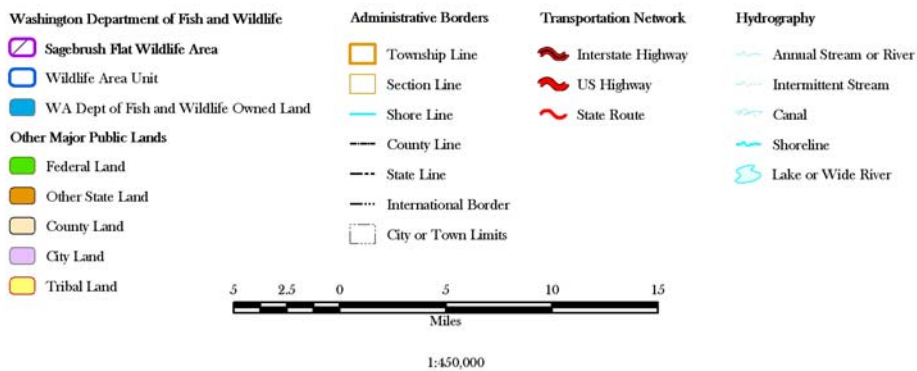
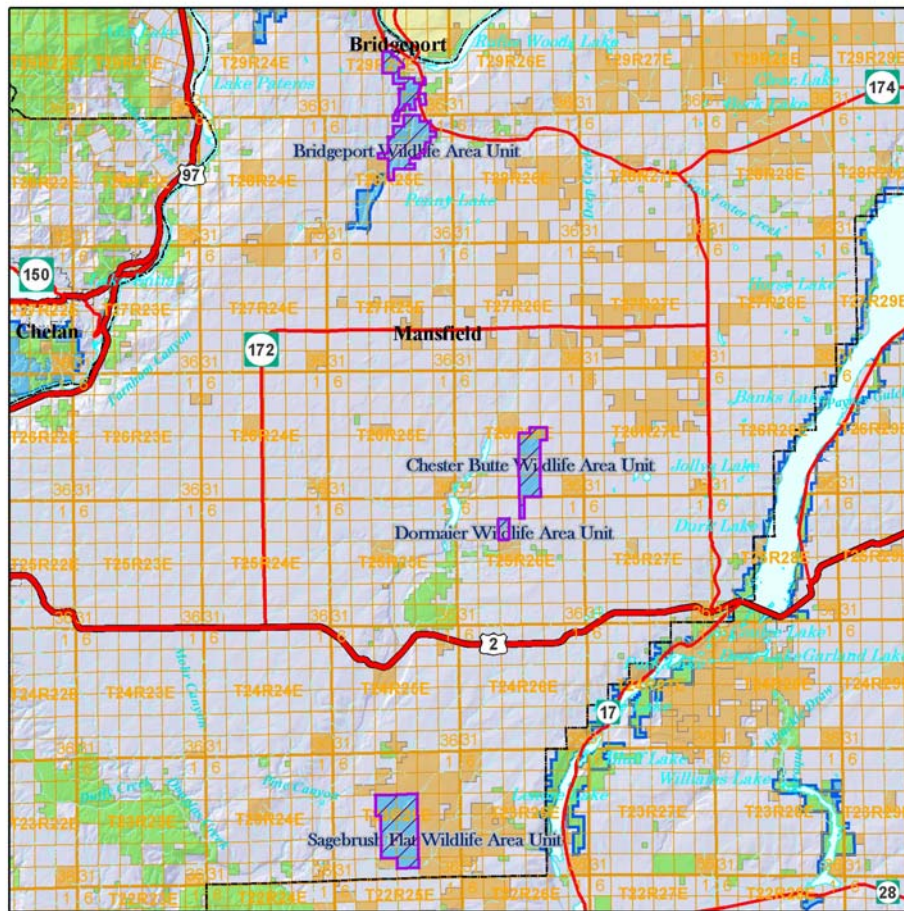
The Sagebrush Flat Wildlife Area plan will be reviewed annually with additional input from the CAG and district team to monitor performance and desired results. Strategies and activities will be adapted where necessary to accomplish management objectives.

## **CHAPTER II. AREA DESCRIPTION AND MAP**

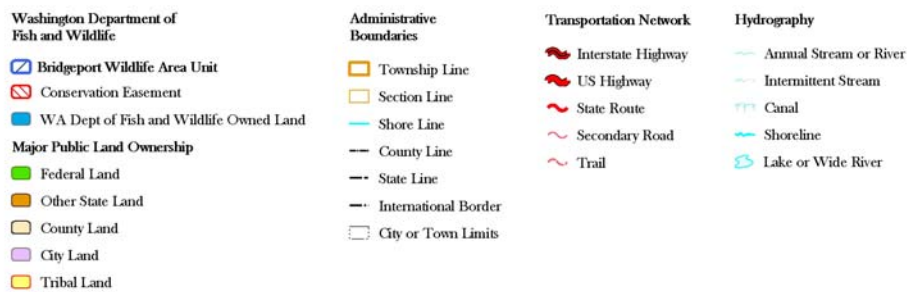
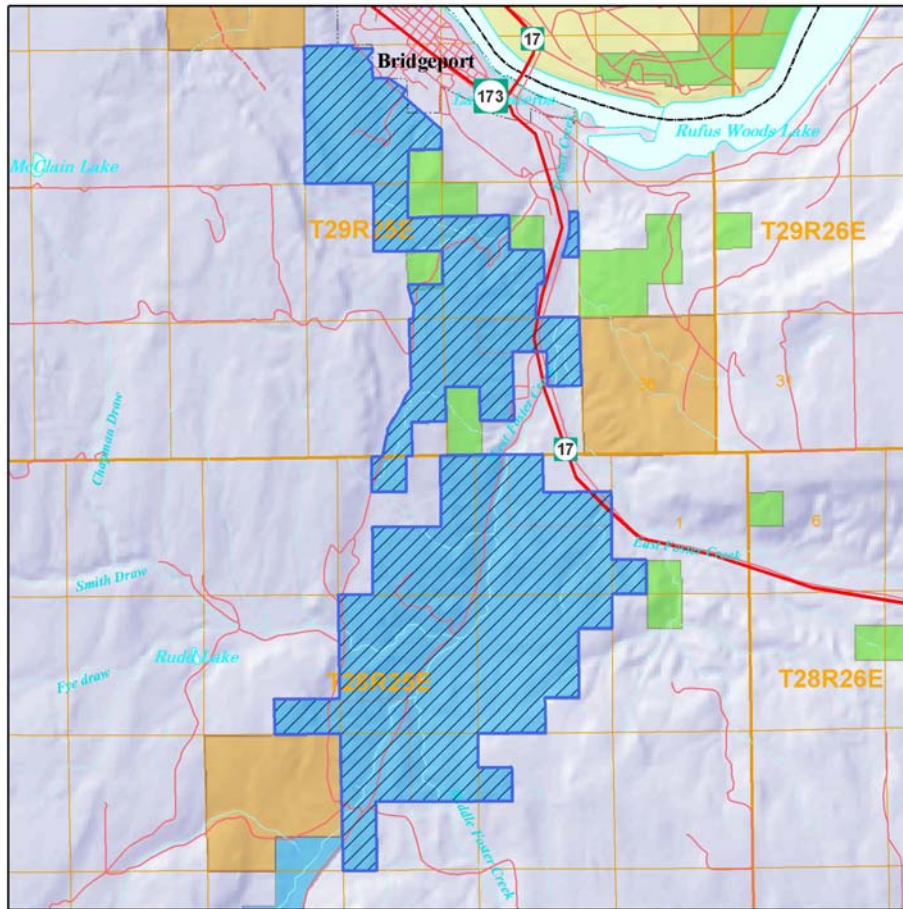
### **2.1 Property Location and Size**

The SFWA (Figure 1) includes the 3,905 acre Bridgeport Unit, the 2,206 acre Chester Butte Unit, the 320 acre Dormaier Unit, and the 3,740 acre Sagebrush Flat Unit. The four Units are located across a wide geographic area within Douglas County. The Units are situated roughly along a north/south line from Bridgeport in the north to the Douglas/Grant county line in the south.

Legal description:     T23N, R25E, Sections 15,16, 21, 22, 27, 28, and 34.  
                              T25N, R26E, Sections 3, 9  
                              T26N, R26E, Sections 14, 15, 22, 23, 27, 34  
                              T28N, R25E, Sections 1, 2, 3, 9, 10, 11, 14, 15

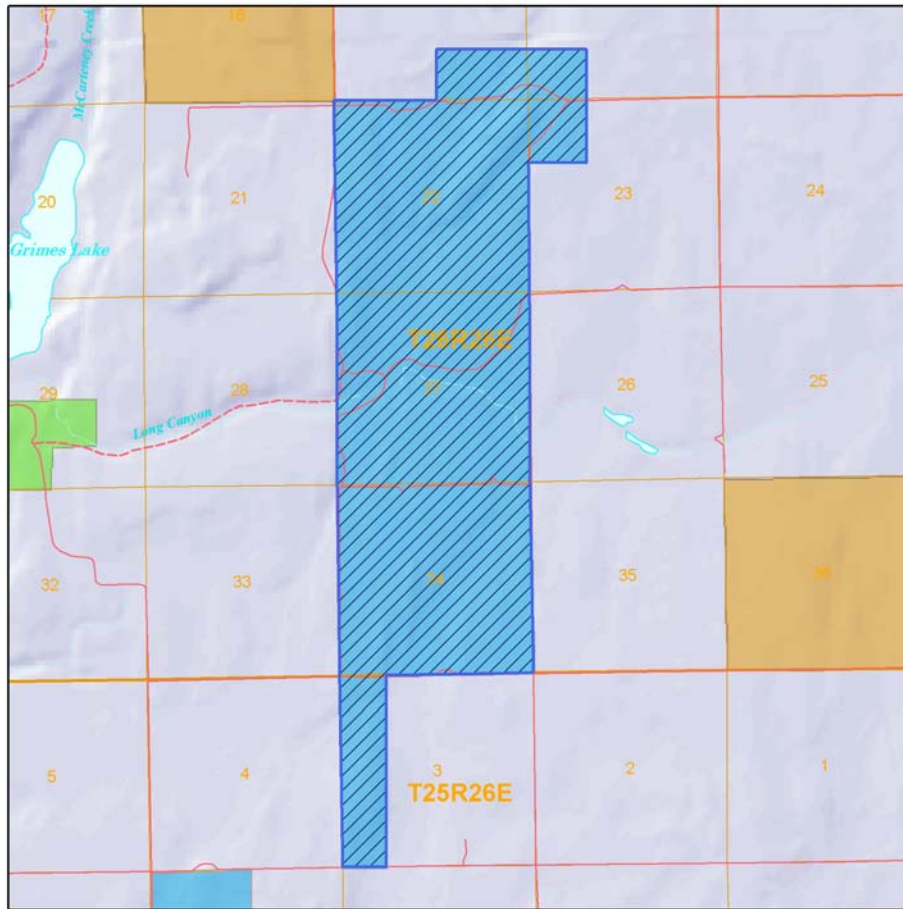


**Figure 1. Sagebrush Flat Wildlife Area**



1:70,000  
1 inch equals 1.1 miles

**Figure 2. Bridgeport Unit**



**Washington Department of Fish and Wildlife**

- Chester Butte Wildlife Area Unit
- Conservation Easement
- WA Dept of Fish and Wildlife Owned Land

**Major Public Land Ownership**

- Federal Land
- Other State Land
- County Land
- City Land
- Tribal Land

**Administrative Boundaries**

- Township Line
- Section Line
- Shore Line
- County Line
- State Line
- International Border
- City or Town Limits

**Transportation Network**

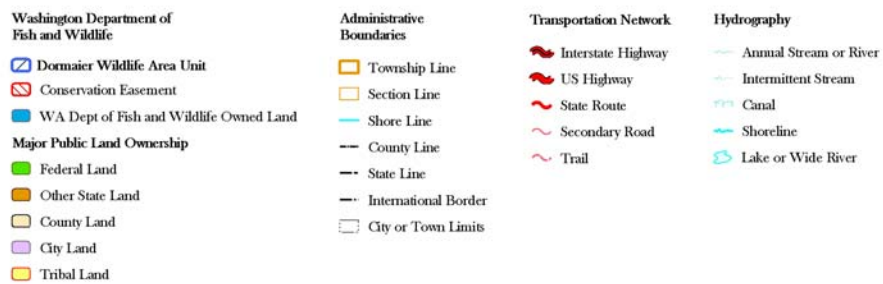
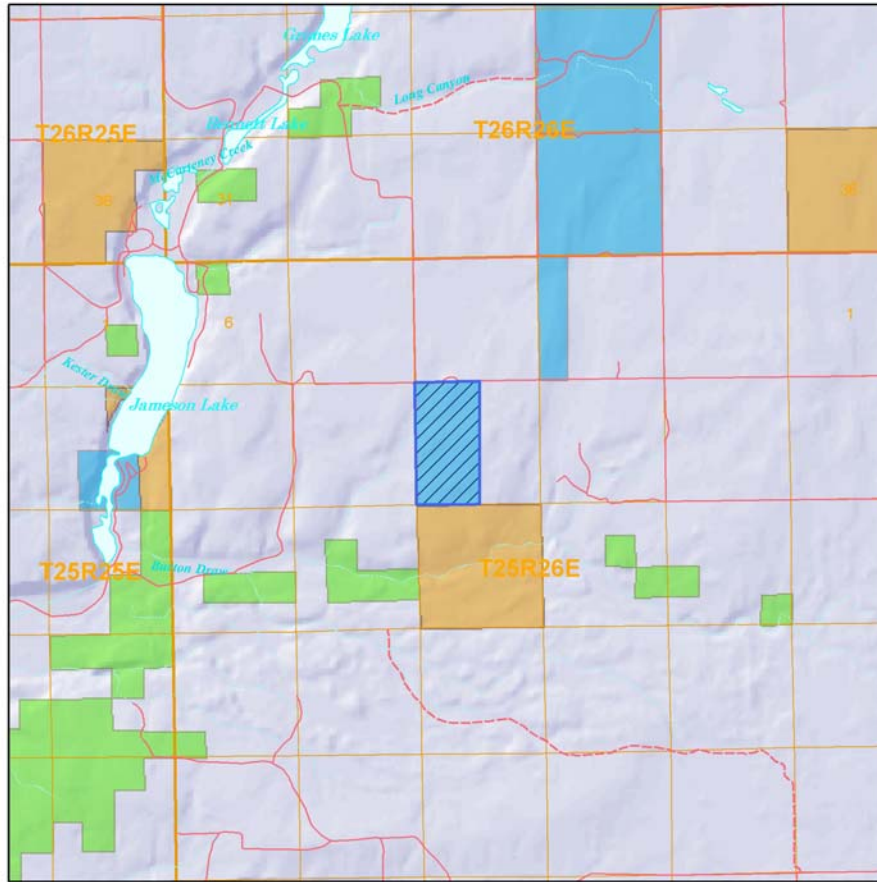
- Interstate Highway
- US Highway
- State Route
- Secondary Road
- Trail

**Hydrography**

- Annual Stream or River
- Intermittent Stream
- Canal
- Shoreline
- Lake or Wide River

1:50,000  
1 inch equals 0.79 miles

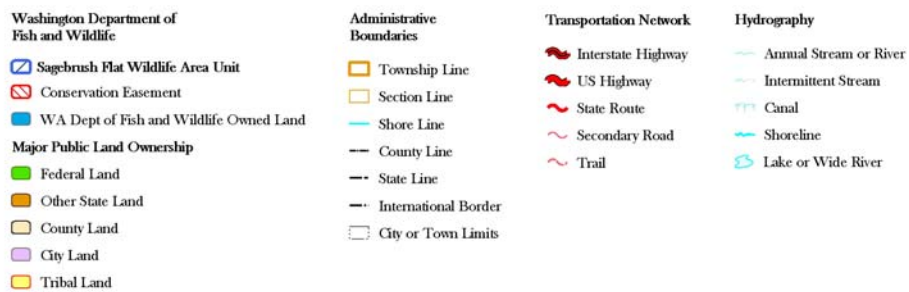
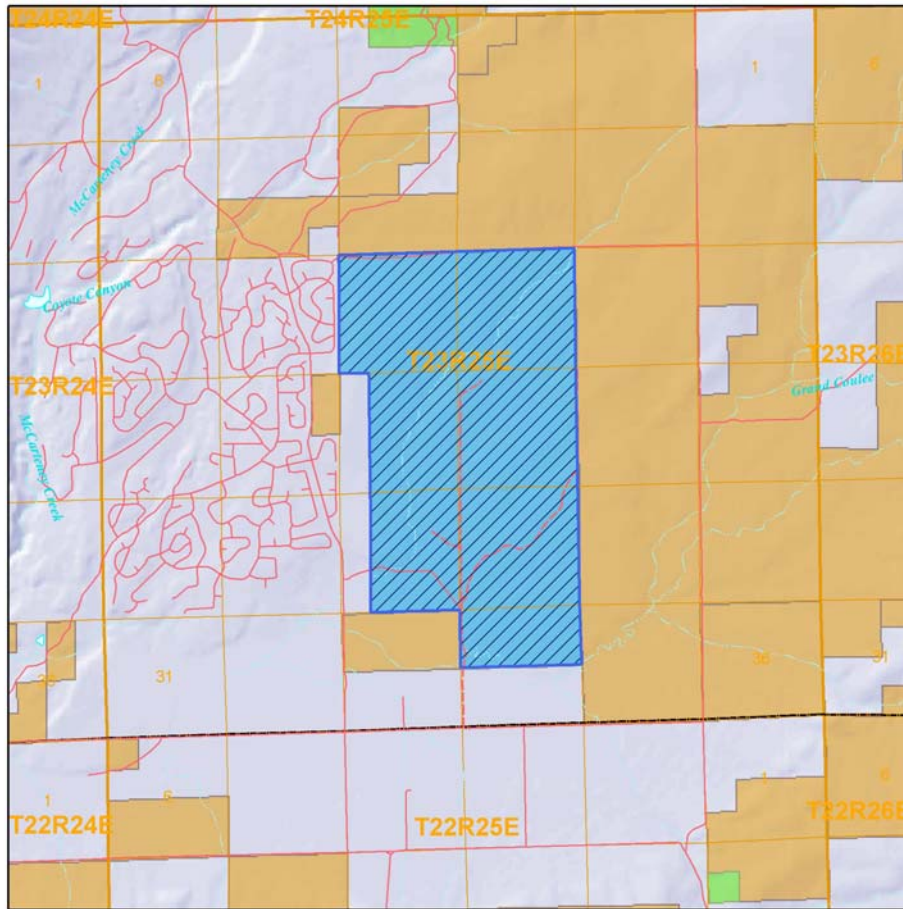
**Figure 3. Chester Butte Unit**



1:75,000  
1 inch equals 1.2 miles

**Figure 4. Dormaier Unit**





1:80,000  
1 inch equals 1.3 miles

**Figure 5. Sagebrush Flat Unit**

## **2.2 Purchase History & Purpose**

The SFWA was approved as a wildlife mitigation project in 1992 and was re-approved for operations and maintenance funding in 2002 as part of the Northwest Power Planning Council's (NWPPC) Provincial /Sub-basin Planning Process. This project is located within the Columbia Plateau Province (Crab Creek Sub-basin) and partially addresses adverse impacts caused by the construction of Chief Joseph and Grand Coulee hydroelectric dams. Since 1991 ten separate purchases have contributed land to the SFWA. The most recent purchases occurred in 2002. Wildlife habitat protection and enhancement efforts to meet mitigation objectives have been underway since 1995 on the Sagebrush Flat Wildlife Area. Continued operation and maintenance activities funded by BPA are necessary to maintain and enhance wildlife habitat benefits and to ensure BPA's mitigation obligation is met. The SFWA is predominantly shrubsteppe habitat. Sharp-tailed grouse, sage grouse, and mule deer are listed in the loss assessments for both dams and were used as habitat indicator species during the Habitat Evaluation Procedure (HEP) analysis. With concurrence from Bonneville Power Administration (BPA), WDFW also used the pygmy rabbit as an indicator species to evaluate shrubsteppe habitat. Consequently the SFWA is managed to promote recovery of the pygmy rabbit, sage grouse and sharp-tailed grouse as well as to protect and provide habitat for other shrub- steppe obligate species and wildlife.

## **2.3 Ownership and Use of Adjacent Lands**

The majority of property adjacent to the SFWA is privately owned. Government agencies owning property next to SFWA include the Washington Department of Natural Resources and the United States Bureau of Land Management. Management of adjacent lands includes wheat farming lands enrolled the Conservation Reserve Program (CRP), fruit orchards and cattle grazing on native shrubsteppe habitat.

Bridgeport and Ephrata are the closest population centers to the areas Units. Wenatchee and East Wenatchee (pop. 34,000), the nearest urban area, are located approximately 30 miles to the west.

## **2.4 Funding**

Funding for management of the wildlife area comes from BPA mitigation funds. The budget for the 2006 fiscal year is \$192,000, which supports all operations and maintenance including salaries on the area.

Portions of four staff positions are supported including:

- .16 fte Wildlife Area Manager (Fish and Wildlife Biologist 3)
- 1 fte Assistant Wildlife Area Manager (Fish and Wildlife Biologist 2)
- 1.2 fte Habitat Tech 1
- .15 fte Equipment Operator

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**

Douglas County lies in the rain shadow of the Cascade Mountains and is partly shielded from harsh Arctic winds in the winter by the Rocky Mountains. The semi-arid climate includes winters that are generally cold but rarely severe and summers that are hot during the day and cool at night. In

winter, the average daily minimum temperatures at Waterville and Wenatchee are 17 and 25 degrees Fahrenheit respectively. The average daily maximum temperature in summer is 83 degrees Fahrenheit. Precipitation ranges from 6 inches to 15 inches. Approximately 65 percent of that total is from snow accumulations. Prevailing winds are from the west/northwest in winter and from the south/southwest in summer.

## **2.6 Soils and Geology**

Douglas County is located in the central part of Washington in the big bend area of the Columbia River. During the Pleistocene Epoch, glacial ice moved south mixing pre-existing soils with material that was carried along and ground up by the ice sheets. This glacial till material was left on the surface as the glacier receded. In some areas it was modified by water; however, in most places the till is an unconsolidated mixture of silt, clay, gravel, sand, cobbles, and large boulders of basalt known as erratics or 'haystack rocks'. Soils in Douglas County include material weathered from glacial till and outwash, loess, volcanic ash and pumice, basalt, granite, sedimentary and metamorphic rock, alluvium, eolian sand and lake sediment.

A layer of till, up to 50 feet thick, covers the northern half of the County. This till is covered by loess to a depth of one to three feet in most places. Drumlins, kames, kettles and eskers are found in northern Douglas County while loess is the predominant soil in the southern portion of the County. Up to 20 feet of loess was deposited as a result of volcanic eruptions; the average depth reaching four to five feet. In the vicinity of the SFWA, loess was deposited over hardpan to a depth of 20 to 40 inches.

## **2.7 Hydrology and Watersheds**

Year-round and seasonal streams as well as springs occur on the Bridgeport Unit. Middle Foster Creek and portions of West Foster Creek are dry for up to 5 months each year. Beavers have created a series of ponds in West Foster Creek and Fye Draw affecting the hydrology in their vicinity. These areas contain important riparian habitat that help support a wide diversity of wildlife. Severe flood events in the last 75 years have left much of the 6.4 miles of stream corridor severely incised and degraded. As a result, the hydrology of the corridor has been negatively impacted as well as the health and quality of the adjacent riparian vegetation.

Management of the wildlife area will consider and apply information from local watershed plans. The Washington State Watershed Management Act (WMA) of 1998 allows for local government, interest groups and citizens to identify and solve water related issues in each of the 62 Water Resource Inventory Areas (WRIAs) of the state. The wildlife area lies in two of these areas: WRIA 44 – Moses Coulee, which includes the Chester Butte, Dormaier and Sagebrush Flat Units; and WRIA 50 – Foster Creek which includes the Bridgeport Unit. Information and watershed plans for the WRIA's are available on the Department of Ecology web site: <http://www.ecy.wa.gov/programs/eap/wrias/index.html>.

The wildlife area is also located in two Northwest Power and Conservation Council (NWPPCC) Subbasins, which are delineated by WRIA boundaries: The Crab Creek and Upper-Mid Columbia Mainstem Subbasins. Access to Subbasin plans is available on the NWPPCC WEB page at: <http://www.nwppcc.org/fw/subbasinplanning/admin/level2/wa/default.htm>.

## 2.8 Fire History

Wildfire intervals in the shrub steppe ecosystem are estimated to be between 60 and 110 years. Daubenmire believed that fire had little influence on the distribution and species composition of eastern Washington shrub steppe. Sagebrush and bitterbrush do not resprout after fire; they depend on seed dispersal to re-establish themselves. Depending on conditions it can take as long as 30 years or more for these shrubs to return to pre-burn densities. Non-native noxious weeds such as cheatgrass and knapweeds will readily invade a burned area. There are two effects this can have on a native plant community: species diversity decreases, and the fire frequency increases. Both effects make it unlikely that a burned area will return to its pre-burn condition. Consequently wildfire can have a catastrophic impact on shrub steppe and the wildlife species that depend on it, particularly pygmy rabbits, sage grouse and sage sparrows.

The most recent fire to occur on SFWA was in the mid 1980's at the Sagebrush Flat Unit when approximately 200 acres burned. A large wildfire on this unit would eliminate most of the high quality pygmy rabbit habitat left in the state. Sagebrush Flat Wildlife Area staff have prepared a fire plan, established fire protection contracts and built fire breaks around the unit in an effort to protect this site.

In some cases fire can be beneficial. It can rejuvenate decadent plants if fire size is limited, seed sources are maintained, and/or fire intensities are low enough to maintain crown sprouting of shrubs. Prescribed fires can take advantage of these conditions, which rarely occur during natural or accidental fires.

## 2.9 Vegetation Characterization

The Sagebrush Flat Wildlife Area is predominantly a big sagebrush/bluebunch wheatgrass plant community. While this is the overall dominant community, each unit has its own distinct variations. The Bridgeport Unit has numerous springs, north facing draws and a 6.4-mile stream corridor. These sites contain a variety of shrubs and trees including serviceberry, rose, chokecherry, hawthorn, black cottonwood, aspen, water birch and silver poplar. In combination, these provide important riparian habitat for a diversity of wildlife. Sharp-tailed grouse are dependant on these areas for food and shelter during the winter months. The Chester Butte Unit has seasonal ponds and meadows that provide habitat for mule deer and migrating waterfowl. The Sagebrush Flat Unit has one of the largest expanses of deep-soil sagebrush habitat in the region while the Dormaier Unit is dominated by big sagebrush. The vegetation and soil characteristics of the Sagebrush Flat and Dormaier Units make them important wintering areas for sage grouse and potential release sites for the reintroduction of the pygmy rabbit. A rare plant, puzzling rockcress (*Halimolobos perplexa* var. *perplexa*), is present on the Sagebrush Flat Unit. Currently this is the only known occurrence west of Idaho.

The major weedy species occurring on the SFWA include diffuse knapweed, Russian knapweed, Canada thistle, Dalmatian toadflax and whitetop. Jointed goat grass occurs in the CRP fields of the Chester Butte Unit and cheatgrass is found throughout the area.

## 2.10 Important Habitats

Shrubsteppe –A number of shrubsteppe obligates depend on this habitat including the pygmy rabbit, Washington ground squirrel, white and black tailed jackrabbits, sage grouse, sage thrasher, sage sparrow and Brewer’s sparrow. This habitat is critical to the Department’s goal of maintaining and increasing the populations of such priority wildlife species as the sharp-tailed grouse, sage grouse and pygmy rabbit. Forty-three other wildlife species are closely associated with shrubsteppe habitat while 103 species are generally associated with shrubsteppe.



*Shrub-steppe Habitat*

Talus/rock – Areas of exposed rock or fields of broken rock. This habitat type provides habitat for many species including rattlesnakes, yellow-bellied marmots, cottontail rabbit, bobcat, bats and weasels.

Riparian – This habitat provides food and shelter for many species of wildlife including mule deer, sharp-tailed grouse and a diversity of neo-tropical migrants. Riparian habitat forms natural corridors that are important travel routes between foraging areas, breeding areas and seasonal ranges, and provides protected dispersal routes for young wildlife. Protected access to water is also an essential attribute of intact riparian habitat. Approximately 85% of Washington’s terrestrial vertebrate species use riparian habitat for essential life activities. Additionally, riparian vegetation maintains streambank stability and water quality.

## 2.11 Fish and Wildlife

Fish and wildlife diversity is of primary importance to the goals and strategies guiding WDFW’s management efforts. The Sagebrush Flat Wildlife Area contains many shrubsteppe dependent species of wildlife. Both the sharp-tailed grouse and sage grouse are listed by the state of Washington as “Threatened” and have been petitioned for federal listing. The pygmy rabbit is listed as “Endangered” by both the State and the United States Fish and Wildlife Service.

The WDFW has developed management plans for these listed species as well as recovery plans for the sage grouse and pygmy rabbit. Each plan emphasizes the conservation, protection and enhancement of shrubsteppe.

Wildlife use on the area is diverse. In addition to the above mentioned species other wildlife that use the area include mule deer, white-tailed jackrabbit, Washington ground squirrel, badger, beaver, raptors, snipe, waterfowl, and numerous songbirds.

Priority species, which are found on the wildlife area include; bald eagle, golden eagle, merlin, peregrine falcon, prairie falcon, northern goshawk, blue grouse, California quail, Lewis woodpecker, loggerhead shrike, California desert bighorn sheep and Rocky Mountain mule deer. (Information on priority Habitats and Species list are available at <http://wdfw.wa.gov/hab/phsvert.htm#birds>)

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

Pygmy rabbit	SE, FE
Greater Sage grouse	ST, FC
Columbian Sharp-tailed grouse	ST, FSC
Loggerhead shrike	SC, FSC
Sage thrasher	SC
Sage sparrow	SC
Sandhill crane	SE
Northern goshawk	SC, FSC
Ferruginous hawk	ST, FSC
Golden eagle	SC
Merlin	SC
Peregrine falcon	SE, FSC
Burrowing owl	SC, FSC
White-tailed jackrabbit	SC
Black-tailed jackrabbit	SC
Washington ground squirrel	SC, FC
Sagebrush lizard	SC

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

## **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 tasks.

Objectives and associated tasks specific to the SFWA are listed where appropriate under applicable agency objectives. Unfunded needs are underlined.

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

##### **1. Protect and restore shrub steppe habitat**

Shrub steppe is the dominant habitat type on the Wildlife Area. The agency has prioritized shrub steppe habitat management and protection. Shrub steppe provides 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. Management actions will include protection from disturbance and degradation such as cattle grazing, vehicular traffic and weed encroachment as well as enhancement and restoration of old agricultural fields.

**A.** Strategy: Protect and enhance habitat for pygmy rabbits, sharp-tailed grouse, sage grouse and other shrub steppe obligate wildlife. This includes minimizing and/or removing disturbance factors, as well as restoring and enhancing suitable sites. Time Frame: Yearlong: 2006 and subsequent years.

**B.** Strategy: *Restore old agricultural fields and other disturbed sites to native shrub steppe habitat.* The Wildlife Area has in excess of 750 acres of old abandoned fields that will require restoration. Utilize CPR funding if possible. Time Frame: 2006-2010.

**C.** Strategy: *Control noxious weeds on all units using Integrated Pest Management principles.* Prevent weed infestations by minimizing soil disturbance and seeding disturbed areas to permanent cover. Time Frame: Annually: March – November in 2006 and subsequent years.

**D.** Strategy: Maintain boundary fences to prevent trespass livestock grazing. Time Frame: Ongoing: March –November in 2006 and subsequent years.

**E.** Strategy: Maintain fire protection contracts with local fire districts and develop fire plans for each Unit. Time Frame: Yearlong: 2006 and subsequent years.

**F.** Strategy: Contingent upon funding and availability, acquire through fee title purchase good quality shrub steppe habitat and or agriculture lands for restoration. Land acquisition efforts should emphasize areas adjacent or close to existing SFWA units and follow criteria in the management plans for sharp-tailed grouse, sage grouse and pygmy rabbits.

**G.** Strategy: Purchase equipment critical for the restoration of old/abandoned agriculture fields. Equipment needed includes tractor and field implements. Time Frame: As funding allows and as needed.

**H.** Strategy: Perform shrub steppe condition surveys to assess habitat quality issues.

**I.** Strategy: *Evaluate the use of prescribed fires on all areas where appropriate to improve shrub steppe habitat and configuration.* Time Frame: Yearlong: 2006 and subsequent years.

**J. Strategy:** *Collect seeds of native species, especially forbs, from the SFWA to have commercially grown to provide a source of locally adapted seed stock for restoration uses.* Time Frame: As needed.

## **2. 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:** Assess restoration efforts and use adaptive management to create and enhance shrub steppe habitat suitable for a diversity of species. Time Frame: Yearlong: 2006 and subsequent years.

**B. Strategy:** Determine species use by conducting and/or facilitating surveys of various bird, reptile, amphibian and mammal, vascular plant, moss, lichen and selected insect species. Cooperate with agencies and private groups to acquire information on wildlife use of the area.

**C. Strategy:** Identify, restore, and conserve all native plant associations found on the Sagebrush Flat Wildlife Area.

**D. Strategy:** See Agency Objective Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objective 1.

## **3. 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:** Protect West Foster Creek riparian corridor from disturbance, weed encroachment and increased runoff. Time Frame: Yearlong: 2006 and subsequent years.

**B. Strategy:** Maintain or construct new, boundary fence to prevent trespass cattle. Time Frame: Yearlong: 2006 and subsequent years.

**C. Strategy:** Plant suitable shrubs and trees within the West Foster Creek corridor  
Time Frame: Annual: March-June & October-November in 2006 and subsequent years.

**D. Strategy:** Protect newly planted shrubs and trees with deer fencing where practical  
Time Frame: Annual: March – November 2006 and subsequent years.

**E. Strategy:** Install irrigation systems to water established water birch trees. Time Frame: When needed and as funding allows.

**F. Strategy:** Assess insect infestation of established water birch trees and release suitable bio-control agents. Coordinate with Washington State University Extension office. Time Frame: Yearlong: 2006 and subsequent years.

## **4. Manage for upland birds**

The SFWA was purchased to protect and enhance shrub steppe habitat for shrub steppe obligates. This habitat also provides habitat for upland birds and big game. Upland birds provide recreational opportunities.

**A. Strategy:** See Agency Objective Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objective 1-6.



## **5. Maintain big game populations**

The SFWA was purchased to protect and enhance shrub steppe habitat for shrub steppe obligates. This habitat also provides habitat for big game and upland birds. Big game provides recreational opportunities.

**A.** Strategy: Include locally collected bitterbrush seed in all seed mixes used in the restoration of agricultural fields. Time Frame: When restoring shrub steppe habitat in deer winter range.

**B.** Strategy: See Agency Objective Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objective 1-6.

## **6. Improve and maintain fish populations**

Sagebrush Flat Wildlife Area has no suitable habitat for any listed fish species and likely lacks habitat for any fish species. Much of West Foster Creek dries up during the summer months. Those portions that do not, have extremely low flows that essentially eliminate the potential for fish survival. Additionally, an old irrigation dam, located on Foster Creek 1.5 miles from its confluence with the Columbia River and 3 miles downstream of the Bridgeport Unit, prevents any possibility of upstream passage. There are management activities, however, that can be beneficial to fish further downstream from the Bridgeport Unit. These include any management action that will reduce the sediment load carried by West Foster Creek.

**A.** Strategy: See Agency Objective Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objective 1-6.

## **7. Waterfowl and shorebird management**

The Bridgeport Unit has the only reliable waterfowl/shorebird habitat on the area. West Foster Creek, the beaver ponds associated with it and the adjoining shrub steppe provides some nesting and migration habitat for these bird groups. Protection, restoration and enhancement of the West Foster Creek corridor are management actions that will benefit these groups.

**A.** Strategy: See Agency Objective Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objective 1-6.

## **8. Protect and manage other species**

Sagebrush Flat Wildlife Area was established to protect and enhance shrub steppe habitat. This habitat is essential to the survival of three listed species: pygmy rabbit, sage grouse and sharp-tailed grouse. Populations of these species have declined as suitable habitat has been converted to agricultural fields and was degraded due to intensive livestock grazing. Statewide, the population of sharp-tailed grouse has declined by nearly 90%, while the pygmy rabbit has declined to the point that it is functionally extinct. A captive breeding program for the pygmy rabbit and translocation plans for the sharp-tailed and sage grouse offer hope that these species can be recovered in Washington. It is the Department's duty to provide suitable habitat in the best possible condition.

**A.** Strategy: See Agency Objective Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objective 1.

**B.** Strategy: Coordinate with other agencies and WDFW divisions to perform rare plant surveys.

- C. Strategy:** *Protect and preserve cryptogammic soils. These were greatly disrupted by grazing and may have a role in noxious weed prevention.* Time Frame: Yearlong: 2006 and subsequent years.
- D. Strategy:** Protect continuous habitat from fragmentation. Time Frame: Yearlong: 2006 and subsequent years.

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

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

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

**A. Strategy:** Preventing weed establishment, as the most cost-effective part of a weed management program, is a priority. This includes restoring disturbed sites, closing roads and minimizing soil disturbance. Time Frame: Ongoing March – November in 2006 and subsequent years.

**B. Strategy:** *Control noxious weeds on all units of the Area using integrated pest management principles.* Time Frame: Annually: March – November in 2006 and subsequent years.

**C. Strategy:** Control weeds on interior and boundary roads of the Area. Time Frame: Annually: March-November in 2006 and subsequent years.

**D. Strategy:** Coordinate weed efforts with federal, state and local entities to improve efficacy and minimize costs. Time Frame: When possible.

**E. Strategy:** *Produce and implement an integrated weed management plan (Appendix 2) to include weed identification and inventory, risk/threat, control priorities, and monitoring.* Time Frame: 2006-2007.

**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, 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. Time Frame: Yearlong: 2006 and subsequent years.

**B. Strategy:** List specific strategies associated with ESA species present or potential. Time Frame: 2006-2007.

**3. Provide fire control on agency lands**

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: Maintain contracts with local, state or federal entities to provide fire suppression support on the SFWA. Time Frame: Yearlong: 2006 and subsequent years.

**B.** Strategy: Provide fire training for wildlife area manager and assistant manager. Develop a fire plan and list of fire responsible individuals (**Appendix 3**). Time Frame: Training – annually in spring or as needed. Fire plan – Yearlong: 2006 and subsequent years

#### **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. Time Frame: As needed in 2006 and subsequent years.

**B.** Strategy: Perform cultural resource survey and assessment before digging-including posts for new fence line, parking lots, toilets, buildings, new agricultural fields, etc. Time Frame: As needed in 2006 and subsequent years.

#### **5. Pay county PILT and assessment obligations**

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

**A.** Strategy: Pay PILT and assessments to counties. Time Frame: Yearlong: 2006 and subsequent years.

### **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.

**A.** Strategy: Protect and preserve sensitive wildlife sites such as active and historic sharp-tailed and sage grouse leks, active bald and golden eagle nesting and roosting sites and big game wintering areas. Time Frame: Yearlong: 2006 and subsequent years.

**B.** Strategy: *Close road access where road conditions are not safe or where conditions have a significant negative impact on fish and wildlife.* Time Frame: Yearlong: 2006 and subsequent years.

**C.** Strategy: Provide open roads where no resource issues exist and when there are sufficient resources to maintain them. Time Frame: Yearlong: 2006 and subsequent years.

**D.** Strategy: Sign all roads with limited access. Time Frame: Yearlong: 2006 and subsequent years.

**E.** Strategy: Provide limited camping where no resource issues exist. Establish time limit for camping on the area.

**F.** Strategy: Provide informational kiosks and signs.

G. Strategy: Cooperate with other agencies in developing and implementing educational and informational programs.

H. Strategy: Evaluate the resource impact of and demand for hiking trails on the area. Where no potential resource impacts exists, consider creation of hiking trails.

I. Strategy: Develop brochure and map of SFWA unit for public distribution.

J. Strategy: Develop GIS layers of all resources, roads, trails, parking and camping areas and other facilities available to the public.

K. Strategy: Provide hunting opportunities for persons with disabilities.

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

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

**A.** Strategy: Maintain office to provide a safe and effective workplace. Provide utilities, phone, computers, etc. Time Frame: Yearlong: 2006 and subsequent years.

**B.** Strategy: Maintain all fences to reduce big game damage issues and to prevent trespass livestock thereby protecting habitat. Time Frame: Yearlong: 2006 and subsequent years.

**C.** Strategy: Maintain interior roads by grading or mowing them as necessary. Time Frame: Yearlong: 2006 and subsequent years.

**D.** Strategy: Maintain campgrounds and parking areas to prevent resource damage and provide access.

**E.** Strategy: Identify and justify other capital needs. Time Frame: As needed.

**F.** Strategy: Dispose of buildings/structures that pose safety or other risks. Time Frame: As needed.

**2. Maintain other structures and physical improvements**

**A.** Strategy: Maintain all signs, gates, culverts, water structures, wells, irrigation systems to perform operation and maintenance of area. Time Frame: Yearlong: 2006 and subsequent years.

**B.** Strategy: Replace/install new boundary and unit signs. Time Frame: Yearlong: 2006 and subsequent years.

**3. Maintain equipment**

**A.** Strategy: Service all equipment including trucks, tractor and implements, weed sprayers, trailers, etc. Time Frame: Yearlong: 2006 and subsequent years.

**B.** Strategy: Rent equipment when needed. Time Frame: As needed.

**4. Pursue funding opportunities**

**A.** Strategy: Apply for grants and other funding opportunities consistent with planned priorities to supplement funding. Time Frame: Ongoing, as funding and time allow.

**B.** Strategy: Enroll lands in CRP and other federal programs to generate revenue and accomplish desired habitat conditions. *Consider the impacts on private CRP contractors.* Time Frame: Ongoing.

## **5. Perform administrative responsibilities**

**A.** Strategy: Work with staff to ensure high morale and job satisfaction. Promote self-motivation and good work ethics. Time Frame: Yearlong: 2006 and subsequent years.

**B.** Strategy: Develop and monitor budgets. Time Frame: Yearlong: 2006 and subsequent years.

**C.** Strategy: Interview, hire, train, evaluate, equip and supervise wildlife area staff. Provide ongoing training opportunity to staff. Time Frame: Yearlong: 2006 and subsequent years.

**D.** Strategy: Supervise employees. Time Frame: Yearlong: 2006 and subsequent years.

**E.** Strategy: Supervise contractors, lessees, permittees, volunteers, Washington Conservation Corps employees, other WDFW personnel, public and private organizations and fire crews working on the area. Time Frame: Yearlong: 2006 and subsequent years.

**F.** Strategy: Negotiate, write and monitor leases and permits. Time Frame: Yearlong: 2006 and subsequent years.

**G.** Strategy: Monitor and evaluate habitat management programs. Time Frame: Yearlong: 2006 and subsequent years.

**H.** Strategy: Write and update and implement a wildlife area management plan, weed control plan and fire control plan. Time Frame: Yearlong: 2006 and subsequent years.

**I.** Strategy: Convene CAG and district team to assess wildlife area specific performance measures, accomplishments, results and to identify new strategies. Complete annual performance report. Time Frame: Yearlong: 2006 and subsequent years.

**J.** Strategy: Conduct wildlife and habitat surveys. Identify and prioritize information and survey needs.

**K.** Strategy: Manage an extensive equipment inventory used for habitat maintenance, enhancement, restoration and preservation. Time Frame: Yearlong: 2006 and subsequent years.

**L.** Strategy: Plan for and purchase supplies, tools and equipment. Time Frame: Yearlong: 2006 and subsequent years.

**M.** Strategy: Apply for grants and implement grant funded projects. Time Frame: As funding and time allows and as the opportunity presents itself.

**N.** Strategy: Complete required BPA quarterly and annual reports. Time Frame: January, April, July, October in 2006 and subsequent years.

**O.** Strategy: Complete annual BPA contract entry into PISCES program. June – October in 2006 and subsequent years.

**P.** Strategy: Complete annual DFW contract entry into CAPS program. Time Frame: September in 2006 and subsequent years.

**Q.** Strategy: Attend meetings and meet with private individuals and agency representatives.

**R.** Strategy: Plan, coordinate and conduct annual meetings with Sagebrush Flat Wildlife Area CAG.

**6. Protect and apply water rights for best use**

Water rights can impact wildlife area operations including food plots, restoration projects, etc.

A. Strategy: Identify and record all water rights and uses of water. Time Frame: 2006.

**7. Preserve, protect and improve the watershed in which the area is located**

The quality of the watershed in which the wildlife area is located influences all aspects of the wildlife area. Degradation of the watershed will increase erosion and consequently the loss of soil that supports wildlife habitat.

A. Strategy: Ensure that management of the wildlife area considers watershed plan recommendations. Time Frame: Yearlong: 2006 and subsequent years.

B. Strategy: Coordinate and cooperate with private and public landowners to maintain and improve watershed quality. Time Frame: Yearlong: 2006 and subsequent years.

C. Strategy: Work with the Natural Resources Conservation Service (NRCS) to ensure the continuation of the Conservation Reserve Program, the Wetland Reserve Program and other conservation programs. Time Frame: Yearlong: 2006 – 2010 and possibly subsequent years.

D. Strategy: Coordinate and cooperate with the Foster Creek Conservation District and with the Habitat Conservation Plan (HCP).

**8. Acquire and trade land to increase wildlife area management efficiency**

A. Strategy: Cooperate with other agencies and private individuals to acquire and/or trade lands to consolidate the WDFW ownership. Time Frame: As funding allows.

## **CHAPTER IV. PERFORMANCE MEASURES, EVALUATION AND UPDATES TO THE SAGEBRUSH FLAT WILDLIFE AREA PLAN**

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. Sagebrush Flat Wildlife Area Performance Measures in 2006 includes:**

- Begin restoration of approximately 80 acres of abandoned agricultural fields located on the Dormaier Unit. Initial activities will include mowing the existing shrubs and grass in late June followed by discing.
- Summer fallow contour and mound areas in CRP field at the Sagebrush Flat Unit. Level mound and contour sites then disc sites to keep area free of vegetation.
- Continue summer fallowing 100-acre grass field located on the Sagebrush Flat Unit. Disc as needed to keep field free of vegetation.
- Plant trees and shrubs on the Bridgeport Unit to enhance and expand riparian habitat.
- Treat up to 150 acres infested with annual and perennial weeds. Treatments will include chemical, biological and mechanical methods.
- Release up to 6,000 bio-control agents to treat perennial weeds, particularly Dalmatian toadflax on the Bridgeport, Chester Butte and Dormaier units
- Maintain 110 acres of reseeded fields planted in 2003, 2004 and 2005 on the Bridgeport Unit. Weed control, mow and interseed as needed.
- Maintain shrubs and trees planted since 2000 as well as native riparian habitat with weed control, fencing and replacement of shrubs and trees lost to mortality.
- Maintain the firebreaks at the Sagebrush Flat Unit to protect the area from fire.
- Remove up to 12 miles of old dilapidated fence from four units, old corrals from the Chester Butte and Sagebrush Flat units and unsafe building rubble and wreckage from the Chester Butte and Dormaier units.
- Maintain 15 miles of roads, 10 parking areas, 5 culverts and numerous informational signs.
- Maintain up 50 miles of on boundary fence and on all wildlife area units.
- Monitor sage and sharp-tailed grouse leks.
- Search for new or satellite leks on or adjacent to the wildlife area.
- Monitor public use of the Wildlife Area.
- Translocate sharp-tailed grouse from Utah to the Bridgeport Unit.
- Search for pygmy rabbits and Washington ground squirrel presence on the Sagebrush Flat, Dormaier and Chester Butte units.
- Complete Sagebrush Flat Wildlife Area Management Plan and annual update.
- Attend CAG and public meetings as needed. Conduct field trips as needed.
- Produce BPA required PISCES reports
- Produce BPA annual report.

### **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

Citizens Advisory Group (CAG) and District Team (DT) Issues and Concerns  
Wells, Sagebrush Flat and Chelan Wildlife Areas  
June 5, 2005

The Wildlife Area Manager Marc Hallet and Dan Peterson, Wildlife Area Assistant Manager, met with the CAG on February 15, 2005 and the Wenatchee District Team on February 17. Marc Hallet met with the Okanogan District Team on March 9, 2005 (part of the Wells Wildlife Area lies in the Okanogan District). The purpose of meeting with the CAG and DT was to obtain input to help guide management actions on the wildlife areas. A draft of the introduction and history of the wildlife areas 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 indicate that the input was received from the DT. Issues that are not underlined originated from the CAG.

### **Issue A. Access/Recreation**

- Regulate public access in big game wintering areas. Seasonally close road, control antler hunting, snowmobile use etc.
- Regulate camping (maximum number of days).
- Provide and/or maintain opportunities for ATV users to recreate on DFW roads.
- Improve and manage wildlife viewing opportunities in a manner that is not detrimental to the wildlife resource.
- Trails: balance recreation opportunities with wildlife concerns (winter range, raptor nest, etc.). Active involvement in placement and management by WDFW staff.
- Define recreational uses and timing.
- Need to provide access to publicly held lands.
- USFS trying to close all areas to ATV use unless designated open – WDFW should do the same.
- It seems that any road management and abandonment plan should really be an access management plan that incorporates the need for hiking trails that can be accommodated without adversely impacting wildlife. It is a great opportunity to increase public appreciation and understanding of wildlife and the wildlife area mission.
- Ensure that access and recreational uses of the wildlife areas are consistent with the wildlife and habitat goals and objectives.

### **Issue B. Wildlife Area Management**

- Evaluate benefit of centrally vs. individually managed wildlife areas or both, with teams of volunteers.
- The wildlife area needs to manage for big game (deer and elk), waterfowl, and non-game such as threatened, endangered and sensitive species.
- Prepare an integrated weed management plan.
- Cooperate and coordinate with adjacent landowners, weed boards and county governments to improve and expand weed control efforts.
- Make prevention of weed establishment a priority.

- 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.
- A fire plan is a great idea – it should include appropriate fuel reduction activities and not just rely on prevention because, eventually, wildfires WILL occur. Prescribed burning could be tricky in some of these areas but should be considered where appropriate.
- Include watershed planning and Multiple Species Habitat Conservation Plan (HCP) information in all management plans. Cooperate with Planning Units.
- Develop habitat and improvements on the Swakane Unit (of the Chelan Wildlife Area) to discourage big game crossing of highway 97.
- In Douglas County, do not renew WDFW - CRP contracts to allow more private lands to remain in the program.
- 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.
- Fire can rejuvenate decadent plants, and be quite beneficial if fire size is limited, seed sources are maintained, and/or fire intensities are low enough to maintain crown sprouting of shrubs. Bitterbrush and sagebrush respond quite differently and it is important to recognize which is the dominant type and manage accordingly
- Consider replacing some developments (guzzlers, feeders, nest structures etc.) with low maintenance alternatives, or through self-maintaining ecosystem restoration approach.
- Consider prescribed fire as appropriate.
- Overall – the largest issue I see with the draft plan is the somewhat agricultural approach to habitat improvement (structures such as guzzlers, bird feeders, fences, nest boxes) that are expensive to maintain and prone to being damaged by fire, and the need to recognize that fire is a part of the ecosystem – need to work with it, not always fight it.
- The White River should be primarily managed for fisheries, wetlands and riparian species, while restoring the native plant species.
- When initiating or renewing leases and permits, consider the impact of creating co-dependence between the lessee/permittee and WDFW, which limits our management flexibility particularly in the long term.
- When making management decisions, evaluate and consider short term and long term impacts on:
  - Watershed functions, water quality, wildlife (particularly impact on T&E species).
  - The wildlife area budget.
  - Critical/sensitive sites, which can be disproportionately severe.
  - Plant and wildlife diversity. This includes potential introduction of new weedy species and aggravation of current weed problems.
- -Habitat important to wildlife currently and potentially present on the area (such as in sharp-tailed grouse, bighorn sheep and sage grouse historical range).
- When making management decisions, evaluate and consider short term and long term impacts on:
  - Watershed functions, water quality, wildlife (particularly impact on T&E species).
  - The wildlife area budget.
  - Critical/sensitive sites, which can be disproportionately severe.
  - Plant and wildlife diversity. This includes potential introduction of new weedy species and aggravation of current weed problems.

-Habitat important to wildlife currently **and** potentially present on the area (such as in sharp-tailed grouse, bighorn sheep and sage grouse historical range).

### **Issue C. Habitat**

- Restore shrubsteppe for sage grouse and pygmy rabbits.
- Use restoration dollars to acquire key habitat.
- We should manage for cliff, emergent wetlands, forested wetlands, and riparian.
- Protect and preserve sensitive wildlife sites such as active Sharp-tailed and Sage grouse lek sites, all snake dens (during spring emergence), active Bald and Golden eagle nests, state and federal listed plant species, big game wintering areas, etc. from human disturbance.
- As a priority, protect and enhance any state and federal listed species and associated habitat found on the Wildlife Area.
- Where management conflicts with a listed species preserve and protect the listed species.
- Manage for native habitats and the processes that sustain them.
- Broaden wildlife area management to include multiple species management.
- Any management distinction between Native and non-Native Species?
- What species would be used for green strips? It would be nice to restore the native bunch grasses that stay green longer in the spring and then occur in bunches that don't spread fire as easily or contiguously as annuals such as cheatgrass or even some of the commonly used rehab grasses.
- Determine presence or role of the more cryptic species such as mollusks and the presence/role of rare or unique plants. Cryptogammic soils greatly disrupted by grazing and may have a role in noxious weed prevention – need to ID and protect any remaining patches, or attempt to recover in other areas.
- Ensure that habitat is not fragmented for some species in the process of creating edge habitat – that is, make sure the edge is truly ecotonal and provides more resources for wildlife and avoid fragmentation.

### **Issue D. Roads**

- Manage roads: closures, reclamation, signing etc.
- Acquire a list of the roads that could be affected by the RMAP program on WDFW lands and maps of the same?

### **Issue E. Enforcement**

- Completely review of WDFW codes for lands.
- Need to get regulations on the books to standardize camping limits to be the same as other public agencies.
- Law enforcement action can be taken regarding trespass livestock.
- Law enforcement needs specific regulations to enforce social behavior on WDFW property – camping length of stay, removal of property, noise etc.
- Need a better picture on the “No ATV Allowed” signs.
- ATV use policy needs to be consistent agency wide.

## **Issue F. Public Information, Education and Involvement**

- Increase public awareness of the area with maps, kiosks, signs, more information on the web, etc.
- Educate the public regarding public access and other regulations.
- Install informational signs and provide brochures for each wildlife area stating reason for purchase, funding source, funding resources, management funding, in lieu of taxes, etc.
- All wildlife areas should have maps like the Sinlahekin map.
- Need informational boards at each end of wildlife areas stating what is allowed and not allowed, to get away from signing each individual site. Consider using “Vehicular Travel Limited to County Roads” signs when appropriate.

## **Issue G. Monitor, Survey and Inventory**

- Develop a centralized inventory of wildlife developments (springs, guzzlers, feeders etc.) with neighboring landowners.
- Inventory public use of the area.
- Recognize and inventory smaller ecosystem - cryptogammic soil crusts, etc.
- Include volunteers and neighbors who might serve as stewards helping to manage and monitor particular sites.
- Identify and prioritize information gaps and identify priority survey needs.
- Monitor and evaluate the effectiveness of management treatments for success and longevity.

## **Issue H. Other**

- Evaluate and optimize staff deployment.
- Maintain staff flexibility. Assign staff to specific areas, facilitating communications with neighboring landowners. Assign staff to live on site. Create shared positions between WDFW with other agencies.
- Whenever possible use and support local contractors and vendors.
- IAC acquired property – need to be aware that some uses may not be compatible on property purchased for critical habitat with IAC dollars. On the other hand, micromanagement by the IAC can be counterproductive.
- Rename the Sagebrush Flat Wildlife Area West Foster Creek Unit to avoid confusion with the West Foster Creek Unit of the Wells Wildlife Area.
- Develop “GO LOOK” on the web site for non-hunting wildlife recreation
- Review Montana Fish, Wildlife and Parks interactive hunt planner and wildlife management area web site section.
- When possible, plant county road sides to permanent cover
- Extend access stewardship decal program to the wildlife areas with funds generated coming back to the wildlife areas.
- Protect the National Historic Register property on the Butte, which was damaged in the Tyee fire (The Lucas homestead).
- Protect American Indian artifacts.

## **APPENDIX 2. SAGEBRUSH FLAT WILDLIFE AREA 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). WDFW will strive to meet its legal obligation to control for noxious weeds listed according to state law (Class A, B-Designate).

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

### **Weed Management Approach**

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

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

Preventing weed establishment and aggravation of existing weed problems is the most cost effective part of a weed management program and therefore a priority. This includes:

- Restoring disturbed sites.
- Minimizing soil disturbance.
- Controlling livestock use on the area.
- Controlling public use.
- Coordinating weed prevention and control efforts with federal, state and local entities to improve efficacy and minimize costs.

Monitoring- Monitoring is necessary to implement prevention and to document the weed species, the distribution and the relative density on the management area. Monitoring will include mapping weed infestation and recording treatment success.

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.

Biological control will be the preferred control method when effective especially in remote inaccessible areas and where other methods pose a threat to the habitat.

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 Sagebrush Flat Wildlife Area:**

Dalmatian toadflax (*Linaria dalmatica ssp. dalmatica*), diffuse knapweed (*Centaurea diffusa*), Russian knapweed (*Acroptilon repens*), whitetop or hoary cress (*Cardaria draba*), Canadian thistle (*Cirsium arvense*), tumble mustard (*Sisymbrium altissimum*), kochia (*Kochia scoparia*), Russian thistle (*Salsola iberica*), prostrate knotweed (*Polygonum aviculare*), puncturevine (*Tribulus terrestris*), Downy brome (*Bromus tectorum*), jointed goatgrass(*Aegilops cylindrical*), quack grass (*Agropyron repens*)

**Table 1. Sagebrush Flat Wildlife Area Weeds.**

Weeds including the state weed class listing and approximate number of acres treated. Note: Douglas county does not have a weed board. Therefore none of the weeds listed have a county designation.

Weed Species	2005 State Weed Class	Wildlife Unit(s)	2005 Treated Acres
Dalmatian Toadflax	B-Designate	Bridgeport, Dezellem, Chester Butte, Dormaier, Sagebrush Flat	40
Russian knapweed	B	Bridgeport, Dezellem, Chester Butte, Dormaier, Sagebrush Flat	2
Diffuse Knapweed	B	Bridgeport, Dezellem, Chester Butte, Dormaier, Sagebrush Flat	6 miles of roadside
Kochia	B	Bridgeport, Dezellem, Chester Butte, Dormaier, Sagebrush Flat	15 miles of firebreaks
Canada thistle	C	Bridgeport, Dezellem, Chester Butte	1.5 acres
Whitetop/hoary cress	C	Bridgeport, Dezellem,	1 acre
General weeds		Bridgeport, Dezellem, Chester Butte, Dormaier, Sagebrush Flat	

B - Designate are state-listed and mandatory for control to prevent seed production/spread.

New Invader is not an official state classification, but indicates the county reserves the right to implement control.

R&S (Reduction and Suppression) Weeds are of wide distribution. Control along transportation corridors is recommended.

Management for individual weed species can be found in the following “Weed Species Control Plan” (WSCP) sections. The following description and management information was taken from the Washington State Weed Board web site

([http://www.nwcb.wa.gov/weed\\_list/weed\\_listhome.html](http://www.nwcb.wa.gov/weed_list/weed_listhome.html)) and the TNC Invasive Species Initiative web site (<http://tncweeds.ucdavis.edu/>).

## DALMATION TOADFLAX CONTROL PLAN

**Scientific name:** *Linaria dalmatica ssp. dalmatica*  
**Updated:** 2005

**Common name:** Dalmatian toadflax

**DESCRIPTION:** The genus name *Linaria* is derived from the Latin word *linon* or *linum* which means flax. The specific name *genistifolia* refers to the leaves which resemble those in the genus *Genista* in the Fabaceae (legume family), and the specific name *dalmatica* refers to Dalmatia in eastern Europe where the plant is a native. *Linaria genistifolia ssp. dalmatica* is most common in the western United States and has a tolerance to low temperatures and coarse soils. The worst-infested states are California, Idaho, Montana, Oregon, Washington, and Wyoming. Dalmatian toadflax is listed as a noxious weed in Colorado, Arizona, Washington and New Mexico.

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. Leaves are broad, 2-5 cm long, ovate to ovate-lanceolate, 1-2.5 cm long and are alternate, generally clasping but crowded. Flowers are born in loose, elongate, terminal racemes. The pedicels are 2-4 mm long when the flowers are mature and releasing pollen. The calyx is 5-7.5 mm long, the segments subequal, broadly lanceolate to ovate, sharply acute, and rigid. The corolla is strongly two-lipped and 14-24 mm long, excluding the 9-17 mm spur. The upper lip is 10-15 mm long. The lower lip is 5-11 mm long with a well-developed palate closing off the throat. The palate is densely white to orange bearded. Flowers are bright yellow. *Linaria genistifolia ssp. dalmatica* typically flowers from May to August. It produces egg-shaped to nearly round capsulate fruits 4-10 mm long by 4-8 mm wide. Seeds are sharply angular, slightly winged, and 1-2 mm long. A mature plant can produce up to 500,000 seeds annually, and they can remain dormant for up to ten years. Dalmatian toadflax produces seed from July to October. Dalmatian toadflax rapidly colonizes open sites. It is most commonly found along roadsides, fences, range lands, croplands, clear cuts, and pastures. Disturbed or cultivated ground is a prime candidate for colonization. Toadflax can significantly reduce crop yields and stress native communities. Dalmatian toadflax is a persistent, aggressive invader capable of forming colonies through adventitious buds from creeping root systems. These colonies can push out native grasses and other perennials, thereby altering the species composition of natural communities. In North America toadflax is considered a strong competitor. It is quick to colonize open sites, and are capable of adapting growth to a wide range of environmental conditions (4). It is listed as weeds in North America, and is on noxious weed lists of several states and Canadian provinces.

Dalmatian toadflax is a native of the Mediterranean region from the coast of Croatia northeastward to Transylvania and Moldavia in northern Romania, southward and eastward around the Black Sea in the countries of Bulgaria, Albania, Greece, Crete, Turkey, Syria, Iran, and Iraq (Alex 1962). It generally grows in open, sunny places, from sea level up to 2,800 meters (roughly 9,200 feet). It was first reported in North America in 1894 by T. D. Hatfield. He was a gardener in Massachusetts who was growing it as a perennial herbaceous ornamental (Alex 1962). In North America, it primarily occurs on sandy or gravelly soil on roadsides, railroads, pastures, cultivated fields, range lands, and clear cuts (Saner *et al.* 1995). It can adapt its growth to fit a range of habitats, and have a tolerance for low temperatures and coarse textured soils. It has a northern limit of 55° to 65° latitude.



Dalmatian toadflax is most common in the western United States. In northeastern Washington, it is spread throughout open, low-elevation, coniferous forests and adjacent shrub-steppe. In Colorado, it is commonly found between 1,524 to 1,981 meters (5,000 to 6,500 feet) in oak, aspen, sagebrush, mountain brush, and riparian communities. Once established, high seed production and the ability for vegetative reproduction allow for rapid spread and high persistence (Saner *et al.* 1995). It relies upon insects for pollination. The two most important pollinators are bumble bees and halictid bees (Zimmerman 1996). Spring emergence occurs about mid-April and depends primarily on temperature. The stems of seedling plants seldom exceed 40 cm. First leaves are 1 cm long. Prostrate stems emerge in September and produce leaves that are ovate, 3.8 cm by 2.2 cm in size. Prostrate stems are tolerant to freezing and are associated with floral stem production the following year (Robocker 1974).

The strong upright floral stems that characterize mature toadflax plants develop after a winter's dormancy, and emerge about the same time as new seedlings in mid-April. The ultimate survival of the stand, and probability of re-establishment, depends heavily on the number of floral stems and their seed production (Robocker 1974). Flowering occurs from May-August and seeds mature from July-September. It can reproduce vegetatively. Stems develop from adventitious buds on primary and lateral roots. Vegetative reproduction from root buds can occur as early as 2-3 weeks after germination, and is possible from root fragments as short as 1 cm in length (Zimmerman 1996). These buds can grow their own root and shoot systems, and become independent plants the next year. Vegetative propagation can allow a stand of toadflax to spread rapidly. In addition to promoting growth, the large, deep, root system exploits water efficiently. The tap root may penetrate 1 meter into the soil and lateral roots may be several meters long. The deep root system prevents grazing and shallow cultivation methods from dislodging or destroying plants (Saner *et al.* 1995).

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

#### **MANAGEMENT INFORMATION:**

The key to managing Dalmatian toadflax is to: 1) eliminate or greatly reduce seed production from established individuals (by cutting or pulling seed stalks prior to seed set, or by using insects to destroy flowers, seeds, or damage plants sufficiently so that no or few seeds are produced); and 2) destroy toadflax seedlings that arise from the soil seed bank before these plants become established. Permanent, long-term control cannot be achieved with herbicide treatment alone (Saner *et al.* 1995). Herbicides should be applied during flowering when carbohydrate reserves in the root of the plants are at their lowest. At the latest, herbicide treatment should be applied before seed dispersal, if it is to be effective. The herbicides glyphosate, dicamba and picloram are considered effective for controlling toadflax. A six-year study found that phenoxypropionic herbicides such as diclorprop were more effective at controlling toadflax than phenoxyacetic herbicides such as 2,4-D (Robocker 1968). 2,4-D, MCPA, MCPB, and mecoprop do not control toadflax. 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.

A bioagent, *Mecinus janthinus*, a stem boring weevil, has been shown to be effective in controlling Dalmatian toadflax. Since 2002 over approximately 10,000 have been released on the SFWA.

### **CURRENT DISTRIBUTION ON THE SITE**

All units of the SFWA. The greatest infestations are on the Dormaier, Chester Butte, Bridgeport and Dezellem units.

**ACRES AFFECTED BY WEED:** > 800

**WEED DENSITY:** Low to high

### **GOALS**

Control expanding populations  
Prevent new occurrences

### **OBJECTIVES**

Survey and map existing populations  
More accurately calculate the acres affected by Dalmation toadflax  
Release biological control, *M. janthinus*, at infestations larger than approximately 1 acre  
Continue treating with small infestations with herbicides

### **ACTIONS PLANNED**

In 2006, the Bridgeport and Dezellem units will be surveyed and spot treated with herbicide by ATV.

The biological agent, *M. janthinus*, will be released in areas where the infestation size makes it impractical to treat with herbicides.

Monitoring will continue on an annual basis on all units.

### **CONTROL SUMMARY AND TREND**

2000- Approximately 10 acres were treated.  
2001- Approximately 30 acres were treated.  
2002- Approximately 50 acres were treated.  
2003- Approximately 40 acres were treated.  
2004- Approximately 50 acres were treated.  
2005- Approximately 40 acres were treated.

Trend is at best static. We continue to treat smaller isolated patches and individual plants with herbicides during the flowering stages and in late fall. Larger patches, and areas with large contiguous infestations have been treated with the release of the bioagent *Mecinus janthinus*. Releases begin in 2002. To date we have yet to observe a reduction in the size of the treated infestations.

## RUSSIAN KNAPWEED CONTROL PLAN

**Scientific name:** *Acroptilon repens*

**Common name:** Russian knapweed

**Updated:** 2005

**DESCRIPTION:** *Acroptilon repens* is a perennial herbaceous plant of the aster (sunflower) family (Asteraceae). It is characterized by its extensive root system, low seed production, and persistence. Russian knapweed spreads through creeping horizontal roots and seed. The stems of *Acroptilon repens* are erect, thin, stiff, corymbosely branched, 45-90 cm (18 to 36 in) tall, and when young are covered with soft, short, gray hair. Lower stem leaves are narrowly oblong to linear-lanceolate, and deeply lobed. The upper leaves are oblong, toothed, and become progressively smaller. Rosette leaves are oblanceolate, irregularly pinnately lobed or almost entire, 5-10 cm long, and 1-2.5 cm broad. The flower heads of Russian knapweed are urn-shaped, solitary, 15-17 mm high, and composed of disk flowers only (Zimmerman 1996). Involucres are 12-14 mm high, 5-7 mm broad, ovoid, entire, and greenish at the base with a papery, finely hairy tip. Flowers are numerous, all tubular. The petals are 12.5-13 mm, pink or purple, turning straw colored at maturity. Anthers are 4.5-5.5 mm long, tails absent. The stigma is 3.5 mm long. The pollen diameter is 48-51  $\mu\text{m}$ , spherical, 3-pored, thin-walled, about 2  $\mu\text{m}$  thick and finely granular.

Achenes (seeds) are 2-3 mm long, oval and compressed, 2 mm broad and 1 mm thick (Watson 1980). Achenes are grayish or ivory, with long white bristles (pappus); 6-11 mm long at the tip when young, but these fall from the seed as it matures (Allred and Lee 1996). Achenes are slightly ridged longitudinally with a sub-basal scar immediately lateral to the tip of the base of the seed (Watson 1980).

*Acroptilon repens* has a well-developed root system, which functions as the major means of propagation and spreading. The roots of *Acroptilon repens* can extend more than 7 meters below the soil surface with 2-2.5 meters of growth occurring the first year and 5-7 meters in the second year (Zimmerman 1996). The roots are easily recognizable by their black or dark brown color and presence of small alternately arranged, scale leaves which support buds in their axils (Zimmerman 1996). These buds develop into adventitious shoots, enabling the plant to spread rapidly, and form dense colonies.

*Acroptilon repens* is native to Mongolia, western Turkestan, Iran, Turkish Armenia, and Asia Minor. It is now found on every continent, except Antarctica. Russian knapweed is listed as a serious noxious weed of dryland crops in the southern former Soviet Republics (Watson 1980).

Russian knapweed was first introduced into Canada around 1900 as a contaminant of Turkestan alfalfa seed (Watson and Harris 1984). It did not become a serious weed in Canada until 1928, and its spread is linked to the distribution of knapweed-infested hay (Maddox *et al.* 1985). It is now widespread in the southern portions of the four western provinces and southern Ontario.

The introduction of Russian knapweed into the United States is also thought to be the result of impure Turkestan alfalfa seed, and possibly sugarbeet seed (Maddox *et al.* 1985). It was first introduced in California between 1910-1914. Since then, it has become widespread in the United States and is currently found in at least 412 counties in 21 states (Maddox *et al.* 1985). It is most common in the semi-arid portions of the western U.S. and adjacent Canada, but infestations have also been reported in South Dakota, Minnesota, and Virginia (Maddox *et al.* 1985). The worst-infested states are California, Idaho, Montana, Oregon, and Washington.

## MANAGEMENT INFORMATION:

*A. repens* is a strong competitor and can form dense colonies in disturbed areas. Dense patches of Russian knapweed may have up to 100-300 shoots/m<sup>2</sup> (Watson 1980). The plant extends radially in all directions and can cover an area of 12 m<sup>2</sup> within two years (Watson 1980).

Russian knapweed invades many disturbed western grassland and shrubland communities, as well as riparian forests. Once established, Russian knapweed can dominate an area and significantly reduce desirable vegetation (e.g. perennial grasses). *A. repens* contains an allelopathic polyacetylene compound which inhibits the growth of competing plants (Watson 1980). Tests conducted with alfalfa (*Medicago sativa*), barnyard grass (*Echinochloa crusgalli*), and red millet (*Panicum miliaceum*) indicated Russian knapweed effectively inhibits root length elongation of grasses as well as broad-leaved plants by 30% when the polyacetylene compound is at a soil concentration of 4 parts per million (Stevens 1986). This allelopathic effect, combined with dense vegetative reproduction, allows for Russian knapweed to quickly colonize and dominate new sites. Infestations of Russian knapweed can survive indefinitely through their root system (Watson 1980). A stand in Saskatchewan has survived for almost 100 years (Allred and Lee 1996), and Watson (1980) reported that stands of Russian knapweed have been reported to survive for more than 75 years.

There is no single “silver bullet” control method for Russian knapweed. Lasting control requires an integration of mechanical control, chemical control, biological control, proper land management, and vegetative suppression. An effective management program must first control existing infestations, and then promote repopulation by native plants. Continued monitoring and follow-up treatments should be conducted annually to eliminate any re-infestation of knapweed.

The keys to controlling Russian knapweed are to 1) stress the weed and cause it to expend nutrient reserves in its root system, 2) eliminate new seed production, and 3) control its vegetative spread. If sufficient human resources are available, mechanical control is good place to start. Pulling Russian knapweed plants two to three times annually contained, but did not eliminate, an infestation in Washington (Youtie 1998). Cutting, mowing or discing several times annually will also control the existing topgrowth. Often, the plants that do re-emerge are smaller in size and lower in vigor. This is a good indication that the plants are under stress and that their nutrient reserves are declining.

If an infestation is too large to be treated mechanically, herbicides can be applied for effective control. Tordon<sup>TM</sup> (picloram), Transline<sup>TM</sup> (clopyralid), Curtail<sup>TM</sup> (clopyralid + 2,4-D), and Roundup® (glyphosate) are herbicides that have been shown to be effective (Beck 1996, Duncan 1994). Timing the application of herbicides can be critical and is dependent upon the particular herbicide and surrounding environmental conditions.

Biological control agents can place additional stress on Russian knapweed plants. Two biological agents for Russian knapweed have been released in the United States; *Subanguina picridis*, a gall forming nematode, and *Aceria acroptiloni*, a seed gall mite.

Once the initial infestation has been controlled, native species should be replanted to act as a vegetative suppressant. Suppressor species must remove a significant amount of moisture from the soil during the seedling stage, when knapweeds are most vulnerable. Early emergence, rapid dense

growth, and maintenance of high vigor until frost are attributes required by plant species to suppress Russian knapweed.

#### **CURRENT DISTRIBUTION ON THE SITE**

Found in varying degrees of density and area on all units

**ACRES AFFECTED BY WEED:** ~100  
patches.

**WEED DENSITY:** Low, widely scattered

#### **GOALS**

Control expanding populations  
Prevent new occurrences

#### **OBJECTIVES**

Survey and map existing populations  
More accurately calculate the acres affected by Russian knapweed  
Continue treating infestations with herbicides

#### **ACTIONS PLANNED**

In 2006, the newly acquired Dezellem unit and additions to the Bridgeport unit will be surveyed and spot treated with herbicide by ATV. Where practical, larger infestations will be mowed before seed set and subsequently treated with herbicides in the fall.  
Monitoring will continue on an annual basis on all units

#### **CONTROL SUMMARY AND TREND**

2000- Less than 1 acre was treated  
2001- Approximately 1 acre was treated.  
2002- Approximately 1 acre was treated.  
2003- Approximately 1.5 acres were treated.  
2004- Approximately 2 acres were treated.  
2005- Approximately 1 acres were treated.

Slowly declining. Infestations are localized and static. The proximity of some infestations to water limit treatment options, however treatment of upland sites is straight forward and continuing. Formally infested sites have been reseeded with basin wild rye. Cheatgrass control is essential on these sites once the Russian knapweed is eliminated to reduce competition with the wild rye.

## DIFFUSE KNAPWEED CONTROL PLAN

**Scientific name:** *Centaurea diffusa*

**Common name:** Diffuse knapweed

**Updated:** 2005

**DESCRIPTION:** The genus name *Centaurea* commemorates the centaur, the mythical creature of Hippocrates, half horse and half man (Allred and Lee 1996). The specific epithet *diffusa* refers to the open branching pattern of mature plants (Allred and Lee 1996). *Centaurea diffusa* is a highly competitive herb of the aster (sunflower) family (*Asteraceae*). The plants first form low rosettes and may remain in this form for one to several years. After they reach a threshold size they will bolt, flower, set seed, and then die. Thus they may behave as annuals, biennials or short-lived perennials, bolting in their first, second, third, or later summer, respectively. Plants of this type are often called semelparous perennials or short-lived monocarpic perennials.

Stems are upright, 10-60 cm (4-24 in) tall from a deep taproot, highly branched, angled, with short, stiff hairs on the angles (Allred and Lee 1996). There are two types of leaves. The long, deciduous basal leaves, which form the rosette, are stalked and divided into narrow, hairy segments, 3-8 cm (1-3 in) long, and 1-3 cm (0.4-1 in) wide (Zimmerman 1997, Allred and Lee 1996). The stem, or cauline, leaves, which are alternately arranged on the stems, are smaller, less divided, stalkless, and become bract-like near the flower clusters (Zimmerman 1997, Allred and Lee 1996). Flower heads are broadly urn-shaped, 1.5-2.0 cm (0.6-0.8 in) tall, solitary or in clusters of 2-3 at the ends of the branches (Allred and Lee 1996, Watson and Renney 1974). The heads contain two types of flowers, ray flowers around the edges surrounding tubular disk flowers. The petals are white, rose-purple, to lavender (Allred and Lee 1996, Watson and Renney 1974). Mature seeds are formed by mid-August (Watson and Renney 1974). A single diffuse knapweed plant can produce up to 18,000 seeds (Harris and Cranston 1979) and a stand of diffuse knapweed can produce up to 40,000 seeds per square meter (Watson and Renney 1974). In one study, open-pollinated, purple-flowered plants set significantly more seed than white-flowered plants (Harrod and Taylor 1995). Schirman (1981) determined that diffuse knapweed seed production was 1,000 fold that necessary to maintain observed levels of infestation. Laboratory germination tests showed up to and sometimes greater than 95% seed viability (Zimmerman 1997, Schirman 1981). These two observations indicate that an extreme reduction of seed production would be needed to control diffuse knapweed.

*Centaurea diffusa* is a native of Asia minor, the Balkans, and the southern portion of the former Soviet Union, especially the Ukraine and Crimea (Zimmerman 1997). Diffuse knapweed is also common in Romania, the former Yugoslavia, northern Italy, Turkey, Greece, Bulgaria, Syria, and the eastern shore of the Mediterranean (Zimmerman 1997). Diffuse knapweed is found on plains, rangelands, and forested benchlands, particularly on rugged terrain that is not well suited for cultivation. In the United States, *Centaurea diffusa* is generally found on light, dry, porous soils (6). Diffuse knapweed has a northern limit of 53°N Latitude (Watson and Renney 1974), and has been observed at elevations up to 7,000 feet (Zimmerman 1997). Diffuse knapweed can thrive in semi-arid and arid conditions which allows it to be a serious problem in the western United States and the arid southwestern interior of Canada, especially British Columbia (Zimmerman 1997). The density of a diffuse knapweed stand is often correlated with the level of soil disturbance. Additionally, diffuse knapweed prefers open habitats to shaded areas (Watson and Renney 1974). *Centaurea diffusa* is not common on cultivated lands or irrigated pasture because it cannot tolerate cultivation or excessive moisture (Watson and Renney 1974).

Diffuse knapweed was first collected in the U.S. in a Washington state alfalfa field in 1907 and is thought to have been introduced through impure Turkestan alfalfa or possibly hybrid alfalfa seed from Germany (Zimmerman 1997). Diffuse knapweed is now widespread throughout nineteen states, including all of the contiguous states west of the Rocky Mountains (Zimmerman 1997). Idaho, Montana, Oregon, and Washington report the worst infestations (Zimmerman 1997). In western Canada, levels of diffuse knapweed are increasing and roughly 7.5 million hectares appear to be susceptible to knapweed invasion (Harris and Cranston 1979).

### **MANAGEMENT INFORMATION:**

An effective management program needs to first control existing infestations, and then develop a land management plan to deter re-infestation. Since diffuse knapweed reproduces entirely by seed, the key to controlling existing infestations is to eliminate new seed production and deplete the existing seed bank. Since diffuse knapweed tends to grow in dense patches, it is relatively easy to locate and conduct spot treatments. If adequate labor is available, and the infested area is relatively small, hand pulling before seed set may be an effective method of control. Tordon (picloram) is the most widely recommended herbicide for treatment of diffuse knapweed (Harris and Cranston 1979, Watson and Renney 1974). 2,4-D, dicamba, and glyphosate are also considered effective (Muller-Scharer and Shroeder 1993, Watson and Renney 1974). Effective, long-term control will be extremely difficult without development of effective biocontrols for diffuse knapweed (Harris and Cranston 1979).

Once the existing infestation has been controlled, steps should be taken to deter any new infestations of diffuse knapweed. Walk through hand pulling or spot herbicide treatment programs should be conducted three times annually for several years to eliminate any seedlings that germinate from seeds that break out of dormancy. In the fall, the number of rosettes can indicate the quantity of diffuse knapweed plants that will bolt the following spring and help determine what type of management effort will be required. A successful management program should set a goal of < 5% knapweed cover. This is the assumed density of the weed in its native range (Muller-Scharer and Shroeder 1993). Lasting control will require a combination of proper land management, biological control, physical control, chemical control, and suppression by desirable vegetation. This “cumulative stress” method will keep the plant constantly under stress, reducing its ability to flourish and spread. Also, a cumulative stress approach provides a level of redundancy in case one type of control treatment is missed or ineffective. Additionally, since diffuse knapweed has the ability to travel and spread seeds over relatively long distances as a tumble weed, an effort should be made to analyze prevailing winds and infestations on neighboring lands to identify any populations that may pose a threat. Finally, public awareness should be included in any management program. Diffuse knapweed does not respect boundaries and maintaining a high level of public awareness is important for successful control (Muller-Scharer and Shroeder 1993).

Several herbicides are relatively effective at controlling diffuse knapweed. Tordon (picloram) is the most widely recommended (Harris and Cranston 1979, Watson and Renney 1974). Other effective herbicides include dicamba, 2,4-D, and glyphosate (Beck 1997, Youtie 1997, Watson and Renney 1974). To save money and reduce grass injury resulting from higher use rates of a single herbicide, several of these herbicides can be combined (Beck 1997). Tank-mixes of picloram and dicamba (0.25 to 0.5 lb./acre + 0.125 to 0.25 lb./acre), picloram plus 2,4-D (0.188 lb./acre + 1.0 lb./acre), and dicamba plus 2,4-D (0.5 lb./acre + 1.0 lb./acre) all control diffuse knapweed (Beck 1997). A backpack sprayer or a wick is highly recommended in small areas to minimize damage to

non-target plants. Herbicides should be applied before the mature plants set seed to maximize effectiveness.

Currently, there is no single biological control agent that effectively controls diffuse knapweed populations. The biological control of weeds is based on the premise that insect feeding kills and/or stresses plants, or reduces seed production, and eventually causes a reduction in weed density (Berube and Myers 1982). Biological controls, which lower the competitive ability of weeds, could also enhance the effectiveness of other control methods. Biological agents rarely completely eliminate the target pest from an area. Complete elimination of the pest would be self-defeating to long-term control as it would lead to the starvation of the agent and leave the area wide open to re-invasion. WDFW has had some success releasing *Larinus minutus*. *Larinus minutus* a seed eating weevil native to Greece, and now established Montana, Oregon, and Washington. Adult weevils are 4 to 5 mm (0.16 to 0.2 in) long, black, and have a large snout. They deposit eggs in the unopened seed-heads between the pappus hairs from June to September. The larvae feed on pappus hairs and move downward to the seeds. Each larva constructs a cocoon and pupates within it. Adults are active in the field from May until August and will feed on leaves and flowers prior to laying eggs. Adults generally live up to fourteen weeks.

#### **CURRENT DISTRIBUTION ON THE SITE**

Found predominately along roadsides within the units as well as adjacent county roads. Scattered patches within the Dezellem, Bridgeport, Chester Butte and Dormaier units.

**ACRES AFFECTED BY WEED:** ~50, plus 6-10 miles of roadside **WEED DENSITY:** Low, widely scattered patches.

#### **GOALS**

Control expanding populations  
Prevent new occurrences

#### **OBJECTIVES**

Survey and map existing populations  
More accurately calculate the acres affected by diffuse knapweed  
Continue treating infestations with herbicides  
Release bio-control at large infestations

#### **ACTIONS PLANNED**

In 2006, the newly acquired Dezellem unit and additions to the Bridgeport unit will be surveyed and spot treated with herbicide by ATV. Roadside spraying will continue including portions of adjacent county roads (with county concurrence). Monitoring will continue on an annual basis on all units

#### **CONTROL SUMMARY AND TREND**

2000- Approximately 4 acres were treated  
2001- Approximately 4 acres and 3 miles of road were treated.  
2002- Approximately 8 acres and 6 miles of road were treated.  
2003- Approximately 6 acres and 4 miles of road were treated.  
2004- Approximately 4 acres and 4 miles of road were treated.



2005- Approximately 1 acres and 4 miles of road were treated.

Declining. Diffuse knapweed is primarily confined to roadsides and thus relatively to control. One large infestation on the Bridgeport Unit has been treated with the biocontrol *Larinus minutus*.

## KOCHIA CONTROL PLAN

**Scientific name:** *Kochia scoparia*

**Common name:** Kochia

**Updated:** 2005

**DESCRIPTION:** Kochia is an annual plant that reproduces from seeds. It has a deep taproot. The erect, much-branched stems are three to seven feet long, smooth below but usually hairy above. The alternate, simple leaves are pubescent to nearly glabrous, one to two inches long, lanceolate to linear with hairy margins, and without petioles. The small green flowers lack petals and are found in clusters in the axils of the upper leaves and in terminal spikes. The brown flattened seeds are about 1/16 inch long and grooved on each side. The species typically produces around 14,600 seeds per plant. Seeds are dispersed in the fall when the plant becomes a tumbleweed. The plant tumbles with the wind, dropping seeds as it is blown about. Laboratory studies report germination rates of 76 percent or better over a temperature range of 39-106 degrees F. Seeds buried in the soil have five percent viability after one year and zero percent after two years. Kochia reproduces by seed only. Like many other species of the Chenopodiaceae, it becomes a tumble weed when mature. An abscission zone develops at the base of the stem in autumn. When winds reach velocities of 25 miles per hour, the stem breaks and the plants tumble. Kochia overwinters as seeds. The seeds germinate very early in spring because of their frost tolerance. Kochia grows very rapidly through spring and summer and sends down a very long taproot (up to 16 feet). It flowers in late summer and sets seed. Kochia is able to spread long distances very rapidly. Its ability to tolerate drought also enables it to spread quickly. It was considered a rare plant in North Dakota and Kansas in the late 1920's, but with the drought during the 1930's it became abundant. Native to southern and eastern Russia, kochia was introduced to North America from Europe. It was grown as an ornamental hedge around gardens, or used as a backdrop planting because of its dense, conical shape and attractive red color in the late fall. It has since escaped cultivation and spread westward.

### MANAGEMENT INFORMATION:

Early tillage in the spring gives good control of the kochia seedlings. Mowing or slashing the plants before flowering is effective in reducing seed production. Infestations of triazine resistant kochia has been found along railroad lines in eleven states. Research has shown that triazine resistant biotypes were more susceptible to 2,4-D ester than triazine susceptible biotypes. There are also biotypes resistant to 2,4-D or Banvel (dicamba). It is suggested that rotating herbicides would reduce the possibility of an increase in the proportion of plants tolerant to 2,4-D or Banvel.

### CURRENT DISTRIBUTION ON THE SITE

Found predominately along and within the firebreak located on the Sagebrush Flat Unit. Also found along county roadways adjacent the other units.

**ACRES AFFECTED BY WEED:** ~60 (includes Sagebrush Flat **WEED DENSITY:** Low to high firebreak), plus an additional 4-5 miles of roadside.

### GOALS

Control expanding populations  
Prevent new occurrences

**OBJECTIVES**

Survey and map existing populations  
Continue treating small infestations with herbicides

**ACTIONS PLANNED**

In 2006, the Sagebrush Flat firebreak will be plowed approximately 4 times to keep it free of weeds. Roadside (up to 10 miles) spraying will continue including portions of adjacent county roads (with county concurrence).

Monitoring will continue on an annual basis on all units.

**CONTROL SUMMARY AND TREND**

2000- Approximately 60 acres were treated

2001- Approximately 60 acres were treated.

2002- Approximately 60 acres and 2 miles of road were treated.

2003- Approximately 60 acres and 4 miles of road were treated.

2004- Approximately 60 acres and 3 miles of road were treated.

2005- Approximately 60 acres and 3 miles of road were treated.

At present kochia is predominately confined to the firebreak at the Sagebrush Flat Unit and some roadsides. Consequently it has been relatively easy to control with plowing and spot spraying with herbicide.

## CANADA THISTLE CONTROL PLAN

**Scientific name:** *Cirsium arvense*

**Common name:** Canada thistle

**Updated:** 2005

**DESCRIPTION:** *Cirsium arvense* is an erect perennial rhizomatous thistle, usually 0.5 - 1.0 m tall, distinguished from all other thistles by 1) creeping horizontal lateral roots; 2) dense colonial growth; and 3) small dioecious (male and female flowers on separate plants) flower heads. Four varieties are recognized: var. *vestitum* Wimm. & Grab. (leaves gray-tomentose below); var. *integrifolium* Wimm. & Grab. (leaves glabrous below, thin, flat, and entire or shallowly pinnatifid); var. *arvense* (leaves glabrous below, thin, flat, and shallowly to deeply pinnatifid); var. *horridum* Wimm. and Grab. (leaves glabrous below, thick and wavy, with many marginal spines) (Moore 1975). The most common variety of the species in North America is *horridum*. All varieties are interfertile, and one plant of var. *integrifolium* produced seedlings of all four varieties (Detmers 1927). Within each variety there are numerous genotypes, which vary in appearance and in response to management activities. Additionally, *Cirsium arvense* changes morphology in response to environmental conditions (Nadeau and Vanden Born 1989).

Phenology of *Cirsium arvense* varies with ecotype, but follows a general pattern. In Washington state, over-wintering Canada thistle roots develop new underground roots and shoots in January and begin to elongate in February (Rogers 1928). Shoots emerge March - May when mean weekly temperatures reach 5° C. Rosette formation follows, with a period of active vertical growth (about 3 cm/day) in mid-to-late June. Flowering is from June to August in the U.S., and June to September in Canada, when days are 14 to 18 hours long (Hodgson 1968, Van Bruggan 1976, Moore 1975): *Cirsium arvense* is a long-day plant (Linck and Kommedal 1958, Hunter and Smith 1972). Natural areas invaded by *Cirsium arvense* include prairies and other grasslands in the mid-west and Great Plains and riparian areas in the intermountain west. *Cirsium arvense* threatens natural communities by directly competing with and displacing native vegetation, decreasing species diversity, and changing the structure and composition of some habitats. Canada thistle invades natural communities primarily through vegetative expansion, and secondarily through seedling establishment. *Cirsium arvense* spreads primarily by vegetative growth of its roots. The root system can be extensive, growing horizontally as much as 6 m in one season (Rogers 1928). Most patches spread at the rate of 1-2 m/year (Amor and Harris 1975). Most *Cirsium arvense* roots can be found directly below the above-ground shoots, with little extension beyond the border of a patch (Donald 1994). Apparently, the horizontal roots give rise to shoots frequently as they expand the range of a patch. Horizontal roots grow within 15-30 cm of the soil surface, and typically grow in a straight line for 60-90 cm, then bend down and grow vertically. Another horizontal root system is usually initiated at the downward bend (Rogers 1928). Vertical roots can grow as deep as 6.8 m (Rogers 1928) but most roots are in the upper 60 cm of soil (Haderlie et al. 1987). *Cirsium arvense* roots commonly reach a depth of 1.5 m in one-year old plants, and 2 m in 2-10 year old plants (Nadeau 1988). *Cirsium arvense* spreads vegetatively through horizontal growth of the root system, which can extend 4-5 m radially in one season (Bakker 1960). Individual clones can reach 35 m in diameter (Donald 1994).

*Cirsium arvense* readily propagates from stem and root fragments and thus plowing or other soil disturbance can increase thistle densities (Nadeau and Vanden Born 1989). Small root fragments (2 cm) can survive and produce clones up to 2.8 m across within one year (Rogers 1928). Hayden (1934) reported plants developing from root fragments as small as 0.5 cm, and 95% establishment from 1 cm

long root fragments. Root fragments are able to produce new shoots, independent of the presence of root buds (Nadeau 1988). Rogers (1928) stated that a six week old root fragment can still regenerate a plant. Partially buried stem fragments have much higher survival than fully buried fragments, as the cut stems remain photosynthetically active (Magnusson *et al.* 1987). Regrowth from stem fragments is highest in mid-June (>70%) and lower thereafter (0-55%) (Magnusson *et al.* 1987). *Cirsium arvense* is native to southeastern Europe and the eastern Mediterranean (Moore 1975) and possibly to northern Europe, western Asia and northern Africa (Detmers 1927, Amor and Harris 1974). It now has a near global distribution between 37 and 58-59 degrees N in the northern hemisphere (Moore 1975), and at latitudes greater than 37 degrees S in the southern hemisphere exclusive of Antarctica (Amor and Harris 1974). *Cirsium arvense* occurs throughout Europe, northern Africa, western and central Asia, northern India, Japan, China, and northern North America, South Africa, New Zealand, Tasmania, and southeastern Australia (Dewey 1901, Rogers 1928, Hayden 1934, Amor and Harris 1974).

#### **MANAGEMENT INFORMATION:**

Where possible it is best to kill all *Cirsium arvense* plants within a site. Where resources are limited two strategies are recommended: 1) Target *Cirsium arvense* clones based on location, controlling plants in high quality areas first, then in low quality areas. Treat entire clones to prevent resprouting from undamaged roots: 2) Target female clones to reduce seed production and additional spread of *Cirsium arvense*. However, some apparently "male" clones are self-fertile. Control techniques for natural areas are constrained by the need to minimize damage to native species. The best option in prairies and other grasslands is to first enhance growth of native herbaceous species by spring burning, and then cut or spot treat Canada thistle with glyphosate when it is in late bud or early bloom (usually June). It is necessary to prevent shoot growth for at least two years to deplete roots and kill Canada thistle. *Cirsium arvense* management programs should be designed to kill established clones since the species spreads primarily by vegetative expansion of the root system. Prevention of seed production is a secondary consideration since spread by seeds is relatively rare. On the other hand, seedlings are the most susceptible growth stage (Bakker 1960). In areas that are susceptible to thistle invasion but which have not yet been invaded, management programs should be implemented to prevent the species from becoming established. It is important to understand the biology of *Cirsium arvense* as control is greatly influenced by clonal structure (Donald 1994), growth stage (Tworkoski 1992), season of treatment, weather conditions, ecotype (Hodgson 1964), soil type, and control method(s) used. A single control method is rarely effective and it is often necessary to use two or more methods at any given site (Lee 1952, Donald 1992, Diamond 1993). In addition, treatments or combinations that are effective at one site may be ineffective at others (Frank and Tworkoski 1994).

Canada thistle's deep, well-developed root systems make it resilient to most control methods including herbicides. However, *Cirsium arvense* undergoes several growth stages during the growing season and during certain stages root carbohydrates are depleted. Root carbohydrate depletion is related to growth stage and is greatest when flowering occurs, but replenishment is related only to environmental conditions, and generally occurs in late summer and fall. Younger growth stages (spring) are likely more susceptible to herbicide, but the root system is larger and more difficult to kill in spring before the flower stalk emerges; older growth stages (fall) are somewhat less susceptible, but the root system is depleted and smaller, and assimilates are naturally moving from the leaf tissues to the root system (Tworkoski 1992). More assimilate (and hence herbicide) moves into the roots under short days and low temperatures (fall) than long days and warm temperatures (summer; McAllister 1982).

Herbicide effect is enhanced when 1) *Cirsium arvense* roots are weakened during the growing season by herbicide treatment, crop competition, or frequent mowing or tilling; and 2) new shoots are stimulated to grow. Suitable herbicides (e.g. glyphosate) should be applied to new growth when leaves are green (September or October). Avoid applying herbicide to old leaves (thick cuticle limits absorption) or to drought-stressed leaves. Hunter (1996) found that control is improved if thistles are cut in late July and the resprouts treated with glyphosate about 4 weeks later in late August (the 'August rosette stage'). Second best treatment time is at flower-bud stage, when root reserves are lowest, particularly under droughty conditions (Haderlie *et al.* 1987). However, native species can be damaged by growing season herbicide application.

Mowing temporarily reduces above-ground biomass, but does not kill *Cirsium arvense* unless repeated at 7-28 day intervals for up to 4 years. This intensity of mowing is not recommended in natural areas, where it would likely damage native vegetation. Mowing just twice a year, in mid-June and September may reduce or contain Canada thistle. When mowing, cut high enough to leave > 9 leaves/stem, or >20 cm of bare stem tissue, as mature Canada thistle leaves and stems independently inhibit development of shoots from rootbuds. When the primary stem is removed, rootbuds are stimulated to produce new shoots that might otherwise be suppressed, especially under low humidity.

Early studies recommended mowing at frequent intervals to starve Canada thistle's root systems and remove *it* from farm fields and pastures (Cox 1913, Johnson 1912, Hansen 1918, Detmers 1929). Mowing monthly for a four-year period eliminated practically all thistles (Welton *et al.* 1929) and mowing at 21-day intervals weakened roots and prevented seed production (Seely 1952). Hodgson (1968) found that mowing alfalfa fields twice annually, at Canada thistle's early-bud to pre-flowering stage (early to mid-June in Montana) and early fall (September) reduced Canada thistle to 1% of its initial value in four years. Mowing two to three times a year can prevent seed set (Hansen 1913, Rogers 1928) but mowing once a year is ineffective (Donald 1990). In order to prevent production of viable seeds, stems must be mown before the flowers open when they have been open for only a few days. Stems with flowers that have been open 8-10 days can develop viable seeds (Derscheid and Schultz 1960).

### **CURRENT DISTRIBUTION ON THE SITE**

Heaviest infestations occur on the Bridgeport Unit in moister sites. The Chester Butte Unit has at least two sites with scattered occurrence.

**ACRES AFFECTED BY WEED:** ~15

**WEED DENSITY:** Low to high

### **GOALS**

Control expanding populations  
Prevent new occurrences

### **OBJECTIVES**

Survey and map existing populations  
More accurately calculate the acres affected by Canada thistle  
Continue treating infestations with a combination of mechanical control and appropriate use of herbicide

### **ACTIONS PLANNED**

Mow or use weed eaters to eliminate seed heads prior to flowering as described above. Treat rosettes in fall with herbicide.

**CONTROL SUMMARY AND TREND**

2002- Approximately 1 acre was treated.

2003- Approximately 2 acres were treated.

2004- Approximately 2 acres were treated.

2005- Approximately 4 acres were treated.

Some infestations are declining due to annual mowing and herbicide applications.

## WHITETOP CONTROL PLAN

**Scientific name:** *Cardaria draba*  
**Updated:** 2005

**Common name:** Whitetop

**DESCRIPTION:** *C. draba* is a hardy perennial with stout, erect or procumbent stems that can grow 2-5dm tall. The plant is leafy below and branching above with grayish stems (Jepson, 1953). Plants are glabrous or nearly so at the top and densely hairy below (Mulligan & Findlay, 1974). In general, they have a gray-green, soft hairy appearance (hence the name 'hoary').

Seedlings are distinguished by their hypocotyl, which is dull brown-green, but green above. Seed leaves are 2.5x7-9mm, pale, dull gray-green, with a sharp, pepper taste. While young, the leaves are more or less opposite below but alternate above and obscure the stem. Leaves are rolled in bud (Kummer, 1951).

Mature *C. draba* leaves are blue-green, 1.5-7.5 (or even 10) cm long (Fernald, 1950), and are broadly ovate to obovate (Fischer *et al.*, 1978). The lower leaves are long, slender, and taper to a short petiole (Robbins, 1952; Mulligan & Frankton, 1962). The margins are irregular, and may be either smooth or toothed. The leaf surface is weakly to densely hairy (Mulligan and Findlay, 1974). These leaves wither before the flowers open (Scurfield, 1962) and are shed as the seeds mature (Selleck, 1965). The upper leaves are shorter and broader (Fischer *et al.*, 1978). They lack developed petioles, and clasp the stem. The leaf bases may have two sagittate lobes (Fischer *et al.*, 1978; Mulligan & Frankton, 1962).

*C. draba* blooms in early spring and looks like conspicuous patches of snowy white (Robbins *et al.*, 1952; Fischer *et al.*, 1978). The showy inflorescences consist of many white flowers in a flattened corymb of racemes. The flower pedicels (stalks) diverge slightly from the stem. Each flower is 2mm wide, and has four petals with long narrow bases, like a spoon (Robbins *et al.*, 1952; Mulligan & Findlay, 1974). The sepals are green and 1.5-2.5mm long. Like other mustard species, there are six stamens and one pistil.

*Cardaria* species are native to southwest Asia, although *C. draba*'s range extends into southeast Europe (Mulligan & Frankton, 1962). *C. draba* probably traveled to the USA in ship's ballast or contaminated alfalfa (Mulligan & Findlay, 1974). It was first collected in North America in Yreka, California in 1876, and Ontario, Canada in 1878 (Robbins, 1940; Mulligan & Findlay, 1974). Other collections, such as in Napa, California (in 1893), a southwestern alfalfa field (in 1898), and New York City (also in 1898) firmly established its presence on the continent (Robbins, 1940; Robbins *et al.*, 1952).

### MANAGEMENT INFORMATION:

Because they can regenerate from their extensive root systems, the hoary cresses readily re-establish after eradication measures. Therefore, control must be persistent, and requires at least 2-3 years of follow-up work (Blackman, *et al.* 1939; Garrad, 1923; Willis, 1950).

Successful control is most likely achieved with a combination of approaches. Selleck (1965) used a combination of mowing and competitive cropping to control *C. chalepensis* and *C. pubescens*. O'Brien and O'Brien (1994)--managers for The Nature Conservancy--controlled *C. draba* by ceasing its irrigation, removing outlying plants, and increasing the general health of the grasslands



they were managing. Other managers for The Nature Conservancy have decreased grazing (Carr, 1995), or developed restoration plans (Hill, 1995).

Prevent new infestations originating from seed sources. Seed may travel in contaminated hay, on farming equipment, and in fresh manure (Carr, 1995). *Cardaria* seeds have been eliminated from manure after one month of decomposition under very moist, warm conditions in late summer (Anonymous, 1970).

Cutting is somewhat effective in controlling *C. draba*. A combination of weed-whacking and applying 2,4-D from a backpack sprayer has provided 50% control at a preserve maintained by The Nature Conservancy (O'Brien & O'Brien, 1994). Meanwhile, a single late-April treatment of cutting plants back to the ground did nothing to control plants in England (Willis, 1950). Cutting in this way, combined with an herbicide application, was no more effective than using herbicides alone. If cutting is to be used, it clearly should be timed properly. Cutting before plants are flowering does little to control plants, while waiting for the plants to be in full flower will result in smaller plants and less seed production (McInnis *et al.*, 1990). However, McInnis *et al.* 1990 recommend that cutting plants be combined with grazing as a primary or long-term solution for control of *C. draba*.

#### **CURRENT DISTRIBUTION ON THE SITE**

Whitetop occurs only on the Bridgeport unit.

**ACRES AFFECTED BY WEED:** ~20      **WEED DENSITY:** Low, confined to areas within the Middle and West Foster Creek as well as the Fye Draw corridors.

#### **GOALS**

Control expanding populations  
Prevent new occurrences

#### **OBJECTIVES**

Survey and map existing populations  
More accurately calculate the acres affected by whitetop.  
Continue treating infestations with a combination of mechanical control and appropriate use of herbicide

#### **ACTIONS PLANNED**

In 2006, the newly acquired Dezelle unit and additions to the Bridgeport unit will be surveyed and spot treated with herbicide by ATV. Where practical, larger infestations will be mowed before seed set and subsequently treated with herbicides in the fall.  
Monitoring will continue on an annual basis on all units

#### **CONTROL SUMMARY AND TREND**

2001- Approximately 1 acre was treated  
2002- Approximately 2 acres were treated.  
2003- Approximately 1.5 acres were treated.  
2004- Approximately 1 acre was treated.  
2005- Approximately 1 acre was treated.

Declined. Rehabilitation of formally infested areas has been attempted using basin wild rye. Cheatgrass control and continued monitoring of sites for reestablishment of whitetop is essential to long term maintenance.

## GENERAL WEEDS CONTROL PLAN

**Scientific name:** *Many*  
**Updated:** 2005

**Common name:** General Weeds

**DESCRIPTION:** General weeds describe mixed vegetation that interferes with maintenance, agricultural, or restoration activities. Examples of general weeds may include vegetation occurring along roadsides, parking areas, trails, and structures and include species like blackberry, cheatgrass, sandbur, puncturevine etc. General weeds may also occur in agricultural fields, or comprise the dominant vegetation at a site identified for habitat restoration and includes species like Jim Hill mustard, reed canarygrass, bindweed, Russian thistle, jointed goatgrass, prostrate knotweed, bursage.

### 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 units have general weeds to some extent.

**ACRES AFFECTED BY WEED:** ~400  
depending on site and weed.

**WEED DENSITY:** Low to moderate

### GOALS

- Control expanding populations
- Prevent new occurrences
- Restore agricultural fields

### OBJECTIVES

Treat high public use areas with residual herbicide to prevent seed production.  
Summer fallow fields in second phase of restoration. Continue treating infestations with a combination of mechanical control and appropriate use of herbicide

### ACTIONS PLANNED

Through 2006 continue summer fallow operations at the Sagebrush Flat Unit, spot treatments of fields reseeded in 2002, 2003 and 2004. Continue roadside spraying and areas of high public use.

### CONTROL SUMMARY AND TREND

2002- Approximately 60 acres were treated.  
2003- Approximately 100 acres were treated.  
2004- Approximately 50 acres were treated.  
2005- Approximately 20 acres were treated.

The acreage of general weeds treated in any one year will vary depending on the number, size and restoration stage of former agricultural fields. “General weeds” occurring along roadsides and higher use areas are treated during spraying operations for diffuse knapweed and Dalmatian toadflax.

## **APPENDIX 3. SAGEBRUSH FLAT WILDLIFE AREA FIRE MANAGEMENT PLAN**

### **Fire Control**

The Sagebrush Flat Wildlife Area maintains fire protection contracts with four local fire districts: Grant County #13 of Ephrata, Douglas County #5 of Mansfield, Douglas County #8 of Coulee City and Douglas-Okanogan County #15 of Brewster and Bridgeport Bar. These districts are paid an annual fee based on the assessed value of the Wildlife Area units within their districts.

It is the Departments policy that Wildlife Area employees are not firefighters and should not fight fires. Wildlife Area staff are trained in fire fighting and fire behavior, however, in order to provide support and information regarding critical habitat values to the Incident Commander of the responding fire district.

Wildlife Habitat Concerns: The Sagebrush Flat Wildlife Area contains fire sensitive habitat that is critical to the survival of the Columbian Basin pygmy rabbit and the Columbian sharp-tailed grouse. Therefore, when a fire occurs in or near the wildlife area, WDFW requests that the Incident Commander or other fire fighting personnel on site to 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 Sagebrush Flat Wildlife Area causes an immediate threat to the area, WDFW requests that he/she seeks aerial support as possible.

Fire on the Area: Request aerial support by contacting the Interagency Dispatch Office (phone number: 509-663-8575 or 800-826-3383 and ask for the Operation or Staff Coordinator). 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.

Any Off-site Fire Threatening the Area: If, in the professional judgment of the Incident Commander, a fire on lands adjacent to Sagebrush Flat threatens the Area, the Incident Commander is to request aerial support as outlined above.

Any Fire Within One Mile of the Area: Alert Interagency Dispatch Center and inform them of the situation.

The following tables list emergency telephone numbers in order of calling priority.

### **Fire Districts – DIAL 911**

NAME	TELEPHONE	CELL
Grant Co. District 13 Ephrata, Shane Heston - Chief Covers the Sagebrush Flat unit	509-754-3276 fire hall	509-750-9017
Douglas Co. District 8	509-632-5280	509-681-0150

Coulee City, Don Rushton – Chief Covers the Sagebrush Flat unit and the south portion of Chester Butte	509-632-5452 work	
Douglas Co. District 1 Waterville, Dale Jordan – Chief Mutual aid for Sagebrush Flat and Chester Butte units	509-745-8270 fire hall 509-745-8375 home	509-669-5570
Douglas Co. District 5 Mansfield, Tom Snell - Chief Covers the Chester Butte and West Foster Creek North units	509-683-1114 fire hall 509-683-1974 home	
Douglas-Okanogan Co. District 15 Brewster and Bridgeport Bar, Mike Webster – Chief Covers the West Foster Creek Bridgeport units	509-689-9408 home	509-733-1674

**Department of Fish and Wildlife** - contact in order listed

NAME	TELEPHONE	PRIVATE TELEPHONE	CELL
Marc Hallet, Wells WA Manager, Office	509-686-4305		509-679-4780 509-449-0386
Dan Peterson, Wells WA Assistant manager	509-686-4305		509-670-1284 509-449-0016
Fidel Rios, Wells WA	509-686-4305		509-670-2485
Fred Wiltse, Wildlife Agent, Brewster			509-733-0079
Jim Brown – Sargeant, Omak Office	509-826-7371		
Regional Office - Ephrata	509-754-4624		
Regional Program Manager – Matt Monda	509-754-4624 (16)		
Beau Patterson, District Biologist	509-663-9764		509-670-9089
Tom McCall, Field Biologist	509-886-5287		509-670-2199
State Patrol Dispatch	911		
Steve Dauma, Enforcement Captain, Ephrata	509-754-4624 (18)		509-989-4984

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

NAME	TELEPHONE
Interagency Dispatch Office Wenatchee	509-663-8575 800-826-3383

**Aerial Support**

Johnson Air Service, Waterville	509-745-8983
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## APPENDIX 4. WATER RIGHTS

### Sagebrush Flat Unit

File #	Cert #	Stat	Doc	Priority Dt	Purpose	Qi	UOM	Qa	Irrig. Acres	WRIA	County	TRS	QQ/Q	1stSrc
G4-039901CL		A	Claim L		ST					44	DOUGLAS	23.0N 25.0E 27	NWSE	WELL
G4-067516CL		A	Claim L		ST					44	DOUGLAS	23.0N 25.0E 22	NWNW	WELL

### Chester Butte Unit

File #	Cert #	Stat	Doc	Priority Dt	Purpose	Qi	UOM	Qa	Irrig. Acres	WRIA	County	TRS	QQ/Q	1stSrc
GA-117742CL		A	Claim S		IR					44	DOUGLAS	26.0N 26.0E 22	SESW	WELL
G4-117743CL		A	Claim S		IR					44	DOUGLAS	26.0N 26.0E 27		TWIN LAKES
G4-117744CL		A	Claim S		IR					44	DOUGLAS	26.0N 26.0E 34	NENW	WELL

### Bridgeport Unit

File #	Cert #	Stat	Doc	Priority Dt	Purpose	Qi	UOM	Qa	Irrig. Acres	WRIA	County	TRS	QQ/Q	1stSrc
S4-049883CL		A	Claim L		IR ST				20	50	DOUGLAS	28.0N 25.0E 10	NWNE	SPRING
G4-08306AWRIS		I	New App.	9/16/1966	DS IR		GPM		105	50	DOUGLAS	29.0N 25.0E 02	SENE	WELL
S4-49886CL		A	Long Form		ST		CFS			50	DOUGLAS	28.0N 25.0E 03	SESE	SPRING
S4-30523		A	New App.	1/07/1991	IR	0.05	CFS		4	50	DOUGLAS	28.0N 25.0E 10		SPRING
S4-162018CL		A	Long Form		DG IR ST		CFS		40	50	DOUGLAS	28.0N 25.0E 15		SPRING
S4-020299CL		A	Long Form		St		CFS			50	DOUGLAS	28.0N 25.0E 15	SWNW	
GA-01780CWRIS	778	A	Cert	1/15/1951	Ci	500	GPM	200		50	DOUGLAS	29.0N 25.0E 35	NENE	INFILTRATION TRENCH

### Abbreviations

**CI**, Commercial Industrial; **DG**, domestic Ground; **DS**, Single Domestic; **FR**, Fire Protection; **IR**, Irrigation; **Qa**, Annual quantity; **Qi**, Instantaneous quantity; **SR**, Storage; **ST**, Stock; **WL**, Wildlife

## APPENDIX 5. MANAGEMENT PLAN COMMENTS & RESPONSES

Washington State Department of Fish and Wildlife, February 2007

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

Comment Author	Organization	Location
Bill Sieverkropp	Unk	Unk
Sharon Davis	Adjacent Landowner	Coulee City

Comments received on the Sagebrush Flat 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
Bill Sieverkropp	Hi Mark, I was looking at this plan and the advisory group and the names, it seem to me that most of the people on the group are special interest people, there needs to be more landowners, because these are the people that these areas affect. Bill	Several private landowners are on the CAG as well as representatives of land management agencies. We will invite other interested parties including other landowners to participate in the future as needed.
	<b>Public Access</b>	
Sharon Davis	I have some concerns that weren't sufficiently addressed in your draft management plan. We own a few sections of land adjacent to one of these wildlife areas. Since WDFW has purchased this land we've seen an increase in traffic and also more trespassing on our property along with vandalism and littering. Trespassers are driving thru our fields and also parking there since WDFW has no parking areas available on their property. Every year our No Trespassing signs are shot gunned and this year some of our signs were replaced with our neighbors Feel Free To Hunt Signs. Our local Game Agents do a good job of policing that area, but they can't be there everyday. We are not against deer hunting. In fact	Your suggestion to educate the hunting public about the sage grouse is an excellent one. We will be working with the Watchable Wildlife Section and regional biologists to develop appropriate materials for public distribution. We will be building parking areas on the Chester Butte and Dormaier units in 2007. Thank you for your comment.



	<p>we allow family and friends to hunt our land. We DO NOT allow any upland game bird hunting on our property. We advise our hunters that they will encounter sage grouse while hunting deer and we ask that they not harass the birds. They respect both our property and the wildlife unlike some of the hunters accessing WDFW lands. I would guess that the majority of those hunters don't even know what a sage grouse is and would not hesitate to shoot them. My proposal to you would be to work with your local landowners prior to hunting season, consider building parking lots on YOUR property and educate YOUR hunters to the fact that Sage Grouse are a species of concern (and could be listed as endangered). This won't do much to curb our trespassing and littering problems, but it would certainly be a step in the right direction for WDFW.</p>	
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## REFERENCE AND RELATED LINKS

WDFW Strategic Plan  
Wildlife Area Statewide Plan  
WDFW policies and procedures  
Sagebrush Flat Wildlife Area - Bonneville Power Administration, 2002 Provincial Project Review, 2002  
Sagebrush Flat Wildlife Area Work Plan Addendum, 2001  
Birds in a Sagebrush Sea, Managing Sagebrush Habitats for Bird Communities. Paige & Ritter, 1999  
Sagebrush Flat Wildlife Area Work Plan, 1998  
WDFW Sage grouse Recovery Plan, 2004  
WDFW Sharp-Tailed Grouse Recovery Plan, 1997  
WDFW Bald Eagle Status Report, 2001  
WDFW Pygmy Rabbit Recovery Plan, 1995  
Sagebrush Flat Wildlife Area Management Plan, 1997  
Steppe Vegetation of Washington. Daubenmire, 1970  
Northwest Power Planning Council, Crab Creek Subbasin Plan, 2004  
(<http://www.nwcouncil.org/fw/subbasinplanning/crab/plan/>)  
Northwest Power Planning Council, Upper Middle Mainstem Subbasin Plan, 2004  
(<http://www.nwcouncil.org/fw/subbasinplanning/uppermidcolumbia/plan/>)  
WDFW Strategic Plan ([http://wdfw.wa.gov/depinfo/strat\\_goals\\_obj.htm](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](http://wdfw.wa.gov/depinfo/strat_goals_obj.htm))  
WDFW Priority Habitat and Species List (<http://wdfw.wa.gov/hab/phslist.htm>)  
WDFW Priority Habitat and Species Recommendations (<http://wdfw.wa.gov/hab/phsrecs.htm>)  
WDFW Sage grouse Recovery Plan, 2004  
WDFW Sharp-Tailed Grouse Recovery Plan, 1997  
WDFW Bald Eagle Status Report, 2001  
WRIAs 44/50 Watershed Plan – Moses Coulee/Foster Creek  
WRIA 49 Watershed Plan – Okanogan Watershed Plan  
WRIA 48 Watershed Plan – Methow Watershed Plan