

**DRAFT**  
**DRISCOLL ISLAND WILDLIFE AREA MANAGEMENT PLAN**  
Washington Department of Fish and Wildlife



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## **CHAPTER I. INTRODUCTION**

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

### **1.1 Agency Mission Statement**

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

### **1.2 Agency Goals and Objectives**

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

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

- Objective 1: Develop, integrate and disseminate sound fish, wildlife and habitat science.
- Objective 2: Protect, restore and enhance fish and wildlife populations and their habitats.
- Objective 3: Ensure WDFW activities, programs, facilities and lands are consistent with local, state and federal regulations that protect and recover fish, wildlife and their habitats.
- Objective 4: Influence the decisions of others that affect 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.
- Objective 15: Reconnect with those interested in Washington's fish and wildlife.

### **1.3 Agency Policies**

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

- 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

- Other policies/contractual obligations/responsibilities

#### **1.4 Driscoll Island Wildlife Area Goals**

Management goals for the Driscoll Island Wildlife Area are to preserve and restore habitat including the processes that maintain healthy functioning habitat, i.e., fire and flooding, 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 fish and wildlife and where they live. Specific management goals and objectives for the Driscoll Island Wildlife Area can be found Chapter 3.

#### **1.5 Planning Process**

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

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

In Eastern Okanogan County a unique opportunity exists to have a single CAG for several Wildlife Areas. This will help reduce numbers of meetings and hopefully encourage sustained participation by CAG members in that they won't have to attend multiple meetings for different wildlife areas. Therefore a single CAG was formed to address management of the Chiliwist, Scotch Creek, Tunk, Chesaw, Driscoll Island and Sinlahekin Wildlife Areas. A list of EOC CAG representatives is in **APPENDIX 7**. Individuals representing these entities will provide input during the planning process and annual reviews.

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 (including the Comprehensive Wildlife Conservation Strategy), 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.

In addition to periodic meetings, field trips will be conducted either in conjunction with meetings or independent of meetings to better acquaint EOC CAG members and DT members with each wildlife area, its plant communities, habitat types, wildlife, visible management activities and topography. This "on-the-ground" time will provide a new dimension regarding each wildlife area for the individuals who participate on the field trips.

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

The final DIWA plan is intended to be a working document reflecting Adaptive Management, i.e., learning by doing, which provides a basis for taking an action, monitoring the outcome of the action and adapting future management actions to better achieve the desired outcome. Additionally, the DIWA management plan will provide information to the interested public including grazing permittees, sharecroppers and neighbors as well as provide a means of trying to maximize benefits from the limited resources provided for management of the DIWA by the Washington State legislature and Federal entities. In short the DIWA plan will attempt to assure money is well spent in management, fish and wildlife needs are being met as best can be provided, and the public's needs and expectations are being met as best as possible. While undertaking all of this, management of the DIWA is accomplished with the idea of being a good neighbor with adjacent landowners.

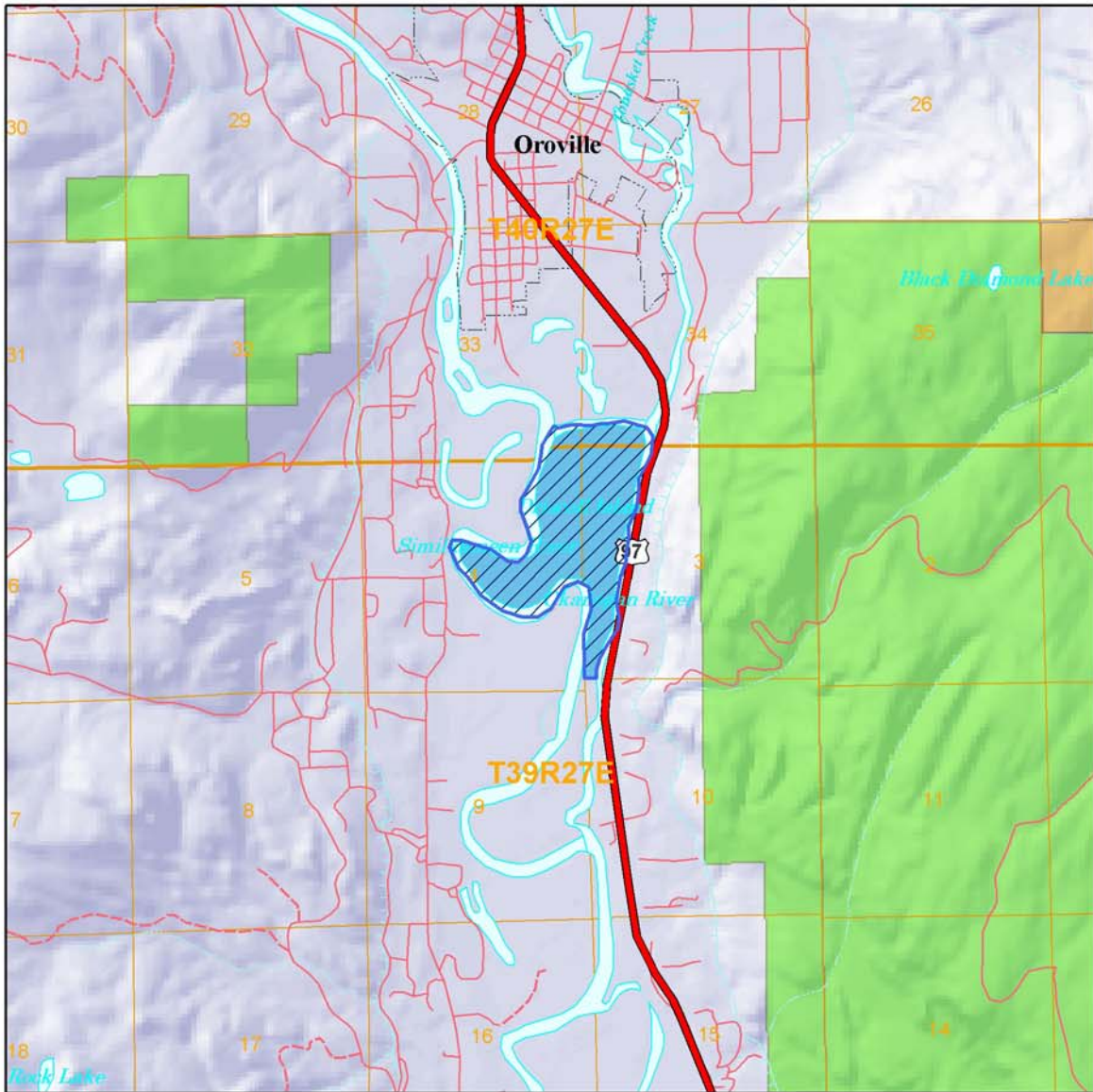


## **CHAPTER II. AREA DESCRIPTION AND MAP**

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

Driscoll Island Wildlife Area (DIWA) (Figure 1) is located about 1 mile south of Oroville in North Central Washington, Okanogan County, at the confluence of the Similkameen and Okanogan Rivers. DIWA is approximately 260 acres in size. All lands owned and managed as part of the DIWA are located in T40N R27 Sections 33, 34 and T39N R27E Sections 3, 4.

**Figure 1. Driscoll Island Wildlife Area**



**Washington Department of Fish and Wildlife**

- Driscoll Island 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

## **2.2 Purchase History and Purpose**

Purchased in 1974, the 260-acre Driscoll Island Wildlife Area became the focal point of Canada goose management in the Oroville area. The primary objective was to provide goose nesting and foraging habitat. In order to provide better goose foraging habitat the island needed to be grazed because the Canada geese prefer short grasses for foraging and to watch for predators that would approach. Additionally, by providing grazed grass pastures next to the rivers, the Canada geese would be lured onto the island for foraging rather than private property in the area. On top of goose habitat management, other activities include the management for upland game birds by planting grain crops and fencing riparian areas to protect the trees and shrubs, needed for cover, from livestock use. Also wildlife-oriented recreation such as hunting and fishing were further reasons for the purchase.

Since the arrival of Europeans Driscoll Island has been farmed and/or grazed. Prior to the Europeans, the island was inhabited by Native Americans for camping and the gathering of such foods as freshwater mussels and fish. Dan Driscoll first settled the island in 1869; in fact one of the cabins he built is still standing on the island.

After purchasing Driscoll Island in 1974, WDFW continued grazing on the island to maintain short grazed grasses for Canada geese forage. Additionally farming of grains was continued to provide feed for upland game birds. Presently only farming for alfalfa and grass hay production occurs. Livestock grazing has been discontinued since 2001.

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

Adjacent landowners are situated across the river channels, where private property can be found to the north, east, and south. Federal ownership, under Bureau of Reclamation administration, is to the West. Almost all of the private lands surrounding DIWA are active agricultural fields contain crops and orchards, which makes up the majority of agricultural fields.

## **2.4 Funding**

The Sinlahekin Wildlife Area Complex including SWA, Driscoll Island Wildlife Area and Chiliwist Wildlife Area are all jointly funded with Federal Aid in Wildlife Restoration Act dollars. The total annual operations and maintenance budget under the Federal Aid in Wildlife Restoration Act fund is \$24,313 with non Federal Aid being \$135,827 for a total annual O&M budget of \$160,140. This amount includes salary and benefits as well as funds for combined. In 1998 a Wildlife Habitat Improvement Program (WHIP) grant was obtained through the Natural Resources Conservation Service (NRCS). The grant funding was used to build fences to keep livestock out of riparian areas, install watering troughs for off river watering sites, plant shrubs and install a watering system for the shrubs. Income from sharecrop agreements is used for capital improvements and/or maintenance.

## **2.5 Climate**

The DIWA climate is typically characteristic of the climate associated with the eastern slopes of the north Cascade Mountains. Hot and dry in the summer months and cold with some precipitation in the winter months. The average annual maximum temperature is 61.3 degrees F (Range 33.0 – 87.2 degrees F)<sup>1</sup>. Average annual minimum temperature is 37.4 degrees F (Range 22.7 – 54.4 degrees F)<sup>1</sup>. Average total annual precipitation is 11.43 inches (Range .5” – 1.44”)<sup>1</sup>. Average total snowfall is 13.9 inches (Range 0”-6”)<sup>1</sup> **APPENDIX 5** - Climatic Information

## 2.6 Physiography

DIWA is at the confluence of the Similkameen and Okanogan Rivers in the Okanogan River Valley. The island is virtually flat with an overflow channel transecting Northeast to Southwest. Evidence suggests that over the millennia the channels of two rivers have shifted back and forth across the island. The island is approximately 280 feet or less Above Sea Level (ASL).

## 2.7 Soils and Geology

Soils of DIWA are described as “Deep mostly grassland and meadow soils on terraces and flood plains” with 2 subcategories: “Pogue-Cashmont-Cashmere association: Deep, somewhat excessively drained and well drained soils” and “Colville-Okanogan association: Deep, somewhat poorly drained and well drained soils” (Soil Survey of Okanogan County Area, Washington. 1980)

## 2.8 Hydrology and Watersheds

DIWA is at the confluence of the Okanogan and Similkameen Rivers. During high water years, much of the island is subjected to flooding. The floodwaters originate from the Similkameen drainage. The Okanogan River is subject to dam control throughout the system by dams within the US and several water control structures in Canada.

## 2.9 Fire History

DIWA is primarily riparian habitat and completely surrounded by river channels, has not been subjected to many fires. Therefore, its fire history has likely been closely associated with Native Americans and Europeans. In 2004 a fire, caused by a goose flying into a power line, occurred. This fire burned most of the riparian area on the portion of Driscoll Island, known as Williams Island. A fire history analysis of DIWA would be very difficult since there are no ponderosa pine trees or Douglas fire trees present that could record fire history on the island.

## 2.10 Vegetation Characterization

Vegetation on DIWA, excluding cultivated ground, is a combination of grasses, shrubs and trees. Refer Appendix 6 for lists of plant species. Patches of brush and trees characterized by Black



Cottonwood, Red Osier Dogwood, Wild Rose, Hawthorn and willow line portions of the shoreline and the overflow channel bisecting the island. The vegetation types are classed primarily as Wetland with several subtypes characterized by Snowberry, Black Cottonwood, Red Osier Dogwood, Hawthorn, Water birch, Mountain Alder and grass/sedges.

DIWA is heavily infested with weeds and is a constant challenge for weed control. A partial list of weeds of concern includes Dalmatian Toadflax, Russian knapweed, diffuse knapweed, and Plumeless thistle. Located at the confluence of two rivers, the island is subject to perpetual re-infestation of weeds due to recurring flood.



## 2.11 Important Habitats

**Riparian**—Areas adjacent to flowing water that support both aquatic and terrestrial life forms. These areas provide cover, create stream channel diversity and provide bank stability and generally support a wider diversity of fish and wildlife than surrounding habitats.



## 2.12 Fish and Wildlife

River channels surrounding DIWA provide migration and spawning habitat for Upper Columbia Steelhead, Fall Chinook salmon and Osoyoos Sockeye salmon. The channels also provide habitat for resident Rainbow trout, Smallmouth bass, and other fish species as well as migration routes for salmon and steelhead.



A small population of White-tailed deer and Mule deer inhabit the island. Upland game birds that use DIWA include Ring-necked pheasant, Hungarian partridge, California quail and Mourning doves. Waterfowl using the island include Canada geese, Woodduck and Mallards. Numerous non-game birds and mammals use the island along with a small number of

amphibians and reptiles. Refer to **appendix 6** for Fish and Wildlife species lists.

## 2.13 History of user groups/recreation use

During the first 12 years of ownership, a footbridge provided year round access to DIWA for hunters, fisher persons and birdwatchers. In 1986 the footbridge was condemned as unsafe for the public to use and was torn out within a year. Presently the only access to DIWA is by wading across the ford during low water generally July 15 – April 15 or by boat. For administrative purposes only, WDFW employees and the sharecropper are allowed vehicle access.

DIWA is a popular place for upland bird hunters in the fall when they pursue the California quail, Hungarian partridge and the Ring-necked pheasants that are found on the island. Those that enjoyed fishing for steelhead can be found wading across the ford in the fall through spring to get to prime fishing holes. There is a small population of Mule deer and a few White-tailed deer that inhabit the island and are hunted occasionally. When there was access to the island by footbridge, people would search for wild asparagus, which can be seen growing throughout the Island. Few use the island for hiking and training their dogs.

The North Okanogan County Sportsmen’s Council and Oroville Sportsmen’s Club installed “goose tubs” to increase nesting sites and production for nesting Canada geese since the 1940’s on Driscoll Island and the surrounding area. The large flocks of Canada geese attest to the success of this program. These organizations have also installed and maintained Wood Duck nesting boxes.

#### **2.14 History of issues**

Driscoll Island was originally acquired to provide an alternative foraging area for Canada geese, to lure onto the island for foraging rather than private property in the area. Cattle grazing became necessary to maintain the preferred foraging conditions for Canada geese. However, grazing was discontinued, because of accessibility and potential riparian issues to the DIWA’s riverbanks involving the endangered Upper Columbia Steelhead, the Summer Chinook salmon and the Osoyoos Sockeye salmon.

Presently the only access to Driscoll Island is by boat or swimming during the high water period (approx. April 15 – July 15). During the remainder of the year DIWA is accessible by driving or wading across an established ford across the east channel, which is subject to periodic water level fluctuations from Zosel Dam and or unseasonable heavy rains.

Access to the island has been an oft-debated issue and was a particularly hot issue shortly after the footbridge was closed and removed. Continual efforts to obtain funding for building a new foot bridge or a service vehicle bridge to DIWA has been unsuccessful, but efforts continue in hopes of providing better access for management and recreationists.

## CHAPTER III. MANAGEMENT OBJECTIVES, ISSUES & STRATEGIES

Statewide goals and objectives listed in chapter one shape management priorities on wildlife areas. Specific wildlife area information including why the area was purchased, habitat conditions, species present, and public issues and concerns are evaluated to identify wildlife area activities or strategies. *Public issues from past planning efforts and the Citizens Advisory Group are noted in italics and are captured in **appendix 1**.* Objectives and associated strategies or tasks specific to the Driscoll Island Wildlife Area are listed where appropriate under applicable agency objectives. Unfunded needs are underlined.

### **Agency Objective: Develop, integrate and disseminate sound fish, wildlife and habitat science**

#### **1. Inventory and map distribution of all species of fauna**

Knowledge of occurrence, distribution, and abundance of fauna including functionality of habitat as it occurs on the DIWA provides information needed in making management decisions. In some cases decisions made to enhance conditions for a species or suite of species may be detrimental to other species.

**A.** Strategy: Conduct systematic baseline inventories of fauna POTENTIAL

FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**B.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 10.

**C.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 13.

**D.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 14.

#### **2. Inventory and map distribution of all species of flora**

Knowledge of occurrence, distribution, and abundance of flora on the DIWA provides information needed in making management decisions. A complete inventory of flora provide information on presence of exotic species including weed species and exotic species that may not be weeds but need control due to their invasive nature. Additionally knowledge about the presence of TES plant species will allow consideration for them in management plans.

**A.** Strategy: Conduct systematic baseline inventories of flora POTENTIAL

FUNDING: Agency Support (Federal Aid), State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., NRCS, BLM, assistance from other WDFW personnel.

TIMEFRAME: Ongoing grant search and application.

**B.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 11

**C.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 12

**D.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 14.

### **3. Inventory and map all historic and contemporary plant communities**

Knowledge of historic and contemporary plant communities provides an opportunity for comparative analysis of historic conditions relative to current conditions. With historic conditions documented, which are often touted as the “future” desired condition, and mapped. Such knowledge, incorporated into DIWA management, provides information needed in making management decisions relative to a documented a historic baseline and future desired conditions. This knowledge, in addition to enhancing the understanding of historic disturbance regimes, e.g., fire and flooding, on the plant communities and ultimately influenced the fish and wildlife species, can also be incorporated into site-specific educational material. This information combined with geologic information, aided by computer animation, would help visualize the vegetational changes as they occurred over the landscape, in a very coarse way since the Cordilleran Ice Sheet covered the area. As the more recent information, e.g., 300-400 years BP, is incorporated the vegetational changes depicted would be more refined. This information would be an important element in contributing to the education of the public regarding the dynamics of plants, climate, soils, geology, disturbance regimes and wildlife

**A. Strategy:** Conduct a comprehensive geofluvial morphological analysis.

POTENTIAL FUNDING: Agency Support (Federal Aid), State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., USFS. TIMEFRAME: Ongoing grant search and application.

**B. Strategy:** Conduct historic fire analysis based on charcoal deposition in sediment layers. POTENTIAL FUNDING: Agency Support (Federal Aid), grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., USFS. TIMEFRAME: Ongoing grant search and application

**C. Strategy:** Conduct historic vegetation presence from pollen deposition in sediment layers. POTENTIAL FUNDING: Agency Support (Federal Aid), State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., USFS. TIMEFRAME: Ongoing grant search and application.

**D. Strategy:** See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 11

**E. Strategy:** See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 12

**F. Strategy:** See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 14.

### **4. Inventory and map soils**

Soils are a fundamental component contributing to plant communities and associations. Knowledge of soils in conjunction with historic fire regimes and historic forest stand conditions will contribute to knowledge about spatial and to some degree temporal relationships of historic vegetation composition and structure. Which will contribute by inference to knowledge about historic quantity and condition of plant communities. Currently soils have only been mapped but not in detail on the DIWA.

**A. Strategy:** Conduct a complete detailed soils survey and map. POTENTIAL FUNDING: Agency Support (Federal Aid), State Wildlife Account, grants when



successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., NRCS. TIMEFRAME: Ongoing grant search and application.

**B.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 11.

**C.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 12.

**D.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 14.

## **5. Research, document and map historic ecosystem functions**

Historic ecosystem functions such as fire and flooding had significant impacts on the plant communities and ultimately the wildlife indigenous to the DIWA. To continue to provide conditions necessary for sustaining populations of indigenous wildlife species these significant ecosystem functions need to be sustained. Knowledge about the historic frequency, magnitude and duration of these functions can be used in developing management prescriptions to maintain conditions for sustaining indigenous populations.

**A.** Strategy: See Agency Objective: Develop, integrate and disseminate sound fish, wildlife and habitat science. Sub-Objective 3.

**B** Strategy: Conduct historic flood regime assessment POTENTIAL FUNDING: Agency Support (Federal Aid), State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., NRCS. TIMEFRAME: Ongoing grant search and application.

**C.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 11.

**D.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 12.

**E.** Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 14.

## **6. Conduct research relative to management activities and impacts on plant communities and wildlife**

Certain management techniques, tools and methods are perpetually contentious, e.g., domestic livestock grazing on rangelands, shrub-steppe; logging after a stand replacing fire; prescribed burning in the spring, summer or fall, etc. Resources devoted to advocating, opposing or defending these management actions can likely be reduced or at least develop prescriptions that use these actions most effectively to meet objectives.

**A.** Strategy: Design and implement research projects to determine impacts of grazing strategies in different plant communities POTENTIAL FUNDING: Agency Support (Federal Aid), State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., NRCS, BLM, USFS. TIMEFRAME: Ongoing grant search and application.

**B.** Strategy: Design and implement research projects to determine impacts of logging after stand replacing fires. POTENTIAL FUNDING: Agency Support (Federal Aid), State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., USFS. TIMEFRAME: Ongoing grant search and application.

C. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 11.

D. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 12.

E. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and their habitats. Sub objective 14.

**7. Establish photo transects and vegetation transects to monitor, over time, vegetation changes in response to management strategies.**

Dynamics of plant communities and disturbance regimes are a significant factor in creating the composition and structure of wildlife habitat. Documenting changes, over time, to plant communities as a result of various management strategies allows for determining cause and effect relationships affecting wildlife species dependent on and/or using that particular plant community. Using this knowledge, management strategies can be refined.

A. Strategy: Establish photo transects and begin regularly scheduled visits, e.g., annually, biennially, decadal, etc., to these transects to collect photos. POTENTIAL FUNDING: Agency Support (Federal Aid), State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, and assistance from other agencies, i.e., NRCS, BLM, other organizations. TIMEFRAME: Ongoing grant search and application.

B. Strategy: Schedule regularly scheduled readings, e.g., decadal, bidecadal, etc., of all vegetation transects established. POTENTIAL FUNDING: Agency Support (Federal Aid), State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., NRCS, BLM, other organizations. TIMEFRAME: Ongoing grant search and application

**8. Participate and cooperate with Federal, State, County and local organizations in research efforts to enhance knowledge regarding all aspects of fish, wildlife, habitat and management of all three on the DIWA.**

Many opportunities exist for participation and cooperation with other governmental and private organizations in research projects that would enhance knowledge about the fish, wildlife, habitat and management of all three. Through cooperative efforts knowledge can be gained which will contribute to an overall more robust program on the DIWA.

A. Strategy: Continually seek opportunities to cooperate and participate in research projects with other governmental agencies and private organizations. FUNDING: Agency Support (Federal Aid), grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., USFS, USFWS, USGS, BLM. TIMEFRAME: Ongoing grant search and application.

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

**1. Manage for big game**

Mule Deer

A very small population of Mule deer inhabits DIWA. The current management of providing irrigated alfalfa and grains on a portion of the DIWA is likely contributing to the reason the Mule deer are using the area. DIWA does not seem to contribute much in terms of winter range judging by the seemingly constant year round population level. It

seems there is not much to offer in terms of management to contribute to better or more Mule deer habitat on DIWA. DIWA provides a very limited opportunity for Mule deer hunting and could provide a limited opportunity for viewing.

The Game Management Plan Statewide Goals for deer management calls for:

“1. Preserve, protect, perpetuate, and manage deer and their habitat to ensure healthy, productive populations.

2. Manage deer for a variety of recreational, educational, and aesthetic purposes including hunting, scientific study, cultural, subsistence, and ceremonial uses by Native Americans, wildlife viewing, and photography.

3. Manage statewide deer populations for a sustainable annual harvest.”

Additionally Objective 57 under Mule deer management states:

“Try to maintain or enhance mule deer habitat including forage and security cover. Direct the Department’s focus toward mule deer habitat improvement and protection.”

And the Strategies under Objective 57 are listed as:

“a. Acquire critical mule deer habitat or conservation easements on critical mule deer habitat.

b. Work with state, federal, and private land managers to conduct prescribed burns that will benefit mule deer.

c. Work with county government growth management planners to limit the expansion of human development on mule deer range.”

d. Work with the Mule Deer Foundation to conduct projects that improve winter range for mule deer.” (Washington Department of Fish and Wildlife Game Management Plan. 2003)

**A. Strategy:** Work with adjacent landowners and other landowners to acquire conservation easements or use other means to provide long-term protection of Mule deer habitat. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, grants when successful. TIMEFRAME: Ongoing grant search and application

**B. Strategy:** Work with private, county, state and federal land managers to promote use of prescribed fire, in a coordinated effort on all lands, to improve mule deer habitat, i.e., North Central Washington Prescribed Fire Council. FUNDING: Federal Aid, State Wildlife Account, Landowner Assistance. TIMEFRAME: Ongoing

### White-tailed Deer

A few White-tailed deer are permanent inhabitants of the DIWA. DIWA provides habitat more typical of that associated with White-tailed deer. Hunting opportunity for White-tailed deer on DIWA is very limited and there may be some potential for limited viewing opportunity.

The Game Management Plan Statewide Goals for deer management call for:

“1. Preserve, protect, perpetuate, and manage deer and their habitat to ensure healthy, productive populations.

2. Manage deer for a variety of recreational, educational, and aesthetic purposes including hunting, scientific study, cultural, subsistence, and ceremonial uses by Native Americans, wildlife viewing, and photography.

3. Manage statewide deer populations for a sustainable annual harvest.

Additionally Objective 58 under White-tailed deer management states:

“Try to maintain current status of white-tailed deer habitat.”

And the Strategies under Objective 57 are listed as:

“a. Work with state, federal, and private land managers to conduct prescribed burns that will benefit mule deer and not expand white-tailed deer habitat.

b. Work with county government growth management planners to limit the expansion of white-tailed deer habitat due to human development.” (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: Continue to provide agricultural lease opportunities for sharecroppers where crops will provide diversity and concentrations of feed for white-tailed deer. FUNDING: Forage (Federal Aid), State Wildlife Account, grants when successful, interns, assistance from other agencies, i.e., USFS, NRCS, BLM, USFWS and other organizations, assistance from other WDFW personnel TIMEFRAME: Ongoing, ongoing grant search and application

### California Bighorn Sheep

California bighorn sheep do not inhabit Driscoll Island however they do frequent the west slopes of Mount Hull across SR 97 from the eastern shorelines of DIWA. There is opportunity to establish a sheep viewing and an interpretive stop for tourists on the DIWA lands on the east shore of the east channel.

Public viewing issue statement under Bighorn Sheep management states: “Bighorn sheep claim a strong aesthetic value throughout most western states. However, because bighorns have a relatively small range in Washington, viewing opportunities are limited. Where viewing opportunities do exist, they have proven to be extremely popular with the public.”

Objective 70 under Bighorn Sheep management states: “Develop viewing opportunities for two bighorn sheep herds.

And the strategies under objective 70 are listed as:

a. Develop vehicle tour and education board for bighorn sheep viewing areas.

b. Develop a web-cam viewing opportunity for bighorn sheep. (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: In coordination with the effort to provide educational viewing opportunities, develop and viewing opportunities on the DIWA near where bighorn sheep frequent and are easily observed. POTENTIAL FUNDING: FNAWS & Bighorn Raffle Fund Grants, when successful, Oroville Gun and Sportsmen’s Club, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, USFS, DNR, USFWS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

Public education issue statement under Bighorn Sheep management: “Bighorn sheep were extirpated from Washington by the early 1900s. However, by securing critical habitats and transplanting sheep, bighorns have slowly recovered. As bighorns continue to do well in Washington, it’s important to inform the public about the biology and management of bighorn sheep, as well as their ecological role in the ecosystem.”

Objective 71 under Bighorn Sheep management states: “Provide educational information on bighorn sheep to at least 50,000 people annually and emphasize contribution of hunters to bighorn sheep recovery.

And the strategies under Objective 71 are listed as:

- “a. Develop a brochure describing bighorn sheep ecology and management, threats from disease, as well as their history in Washington. b. Develop educational viewing opportunities for bighorn sheep (see Objective 70).
- c. Discuss bighorn sheep management at public forums.
- d. Develop segment for Wild About Washington video.

(Washington Department of Fish and Wildlife Game Management Plan. 2003)

**A. Strategy:** In coordination with the effort to provide educational viewing opportunities, develop viewing opportunities on the DIWA where bighorn sheep frequent and are easily observed. POTENTIAL FUNDING: FNAWS & Bighorn Raffle Fund Grants, when successful, Oroville Gun and Sportsmen’s Club, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, USFS, DNR, USFWS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**B. Strategy:** In coordination with the effort to develop a brochure, provide a point of distribution to the public in an area where bighorn sheep are generally readily visible. POTENTIAL FUNDING: FNAWS & Bighorn Raffle Fund Grants, when successful, Oroville Gun and Sportsmen’s Club, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, USFS, DNR, USFWS, assistance from other WDFW personnel. POTENTIAL TIMEFRAME: Ongoing grant search and application.

### Moose

Moose have been observed in the general area surrounding DWIA, but none have been seen or reported as occurring on DIWA. It could be potential moose habitat, but very limited.

The Game Management Plan Statewide Goals for moose management call for:

- “1. Preserve, protect, perpetuate, and manage moose and their habitats to ensure healthy, productive populations.
- 2. Manage moose for a variety of recreational, educational and aesthetic purposes including hunting, scientific study, cultural and ceremonial uses by Native Americans, wildlife viewing and photography.
- 3. Manage statewide moose populations for a sustained yield.”

Habitat Management Issue Statement:

“Moose are expanding both in abundance and range in Washington. However, the quantity and quality of moose habitat has not been evaluated or mapped. Therefore, the potential density and range expansion of moose is unknown.”

Objective 82 under Moose management states:

“Develop a document that identifies the distribution and quality of moose habitat in Washington State.

And the strategies under Objective 82 are listed as:

- “a. Conduct literature review on moose habitat requirements.
- b. Conduct a survey to assess the quality of moose habitats.
- c. Develop a GIS model to predict moose range and the quality of moose habitats.
- d. Develop cooperative partnerships to assess the quality of moose habitats. (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: Assist in efforts to map distribution and quality of moose habitat on and adjacent to the DIWA. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

Information and Education Issue Statement:

The Department has limited information available for the public on moose ecology, population status, and management. To encourage public involvement in moose, there is a need for additional educational materials. Objective 86 under moose management states: Develop educational document regarding moose in Washington.

The strategies under Objective 86 are listed as:

- a. Develop a brochure describing moose ecology and management in Washington.
- b. Expand WDFW's website regarding moose to include basic biology, population statistics, and management. (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: In coordination with the effort to develop and distribute a brochure, provide a point of distribution to the public in an area where moose are present. Additionally provide a link to the moose web page on the DIWA Website.

FUNDING: Watchable Wildlife & other Grants when successful. TIMEFRAME: Ongoing grant search and application.

### Black Bear

There has been one observation of a black bear on DIWA, indicating that they may use it or pass through periodically. Due to the proximity to a high-density human population area, opportunities to manage for black bear are very limited to non-existent. The Game Management Plan Statewide Goals for black bear management call for:

“1. Preserve, protect, perpetuate, and manage black bear and their habitats to ensure healthy, productive populations.

2. Minimize threats to public safety and property damage from black bears, while at the same time maintaining a sustainable and viable bear population.

3. Manage black bear for a variety of recreational, educational and aesthetic purposes including hunting, scientific study, cultural and ceremonial uses by Native Americans, wildlife viewing and photography. 4. Manage statewide black bear populations for a sustained yield.”

Habitat Management Issue Statement: Black bear distribution and habitat use are influenced by a variety of environmental and human factors. It's important to understand and predict how these factors influence bears to better manage bear populations for sustainable harvest, as well as minimizing negative human-bear interactions.

Objective 96 under black bear management states: “Develop a document and map identifying core habitat areas for black bears.

The strategies under Objective 96 are listed as:

- a. Delineate core habitat areas for black bears using regional staff expertise.
- b. Expand habitat preference results from 2001 black bear study final report to entire state.
- c. Work cooperatively with state, federal, tribal, and private entities to develop relative habitat use probability model for black bears (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: Assist in efforts to delineate core black bear habitat on and adjacent to the DIWA. POTENTIAL FUNDING: Agency Support (Federal Aid).  
TIMEFRAME: Ongoing.

## **2. Manage for waterfowl**

Being completely surrounded by river channels Driscoll Island is well suited for management activities to enhance habitat for certain waterfowl species. As indicated earlier DIWA was purchased to provide foraging habitat for Canada geese. Additionally over the years many “goose” tubs have been installed in cottonwood and other species of trees on DIWA. Wood duck nest boxes have been installed on DIWA. Other ducks that commonly use or would use portions of DIWA include Hooded Merganser, Common Merganser, Barrow’s Goldeneye and Mallard. Waterfowl hunting on DIWA is popular with many local residents who primarily use the hunting techniques know as “jump shooting” and “pass shooting”.

DIWA could be a popular bird watching area if access was easier. There is some sentiment against improving the access to DIWA by people who do use it and enjoy the fact there are fewer people because of limited access.

The Game Management Plan Statewide Goals for waterfowl management call for:  
“1. Manage statewide populations of waterfowl for a sustained yield consistent with Pacific Flyway management goals.

2. Manage waterfowl for a variety of recreational, educational and aesthetic purposes including hunting, scientific study, cultural and ceremonial uses by Native Americans, wildlife viewing and photography.

3. Preserve, protect, perpetuate, and manage waterfowl and their habitats to ensure healthy, productive populations.”

Habitat Management Issue Statement:

Wetlands and other waterfowl habitats are being lost throughout Washington due to development and conversion to other uses.

Objective 108 under waterfowl management states:

Provide funding through state migratory bird stamp/print revenues and the Washington Wildlife and Recreation Program to protect/enhance 1000 acres of new habitat annually for all migratory birds.

This acreage target was selected based on past annual accomplishments of the migratory bird stamp/print program.

The strategies under Objective 108 are listed as:

- a. Determine habitat protection and enhancement needs considering Joint Venture plans, literature, and regional expertise.
- b. Solicit project proposals from regional staff and external organizations.
- c. Develop a stamp/print expenditure plan before the start of each new biennium, using an evaluation team from a statewide cross-section of Department experts.
- d. Provide emphasis on projects to increase waterfowl recruitment in eastern Washington, wintering habitat and access in western Washington.
- e. When allocating migratory bird stamp funds, consider fund allocation goals presented to the Legislature when the program was established:

- .. Habitat acquisition 48%
- .. Enhancement of wildlife areas 25%

- .. Project administration 18%
- .. Food plots on private lands 9%

f. Monitor effectiveness of habitat projects through focused evaluation projects before and after implementation. (Washington Department of Fish and Wildlife Game Management Plan. 2003)

**A. Strategy:** Assist in efforts to determine habitat enhancement needs considering Joint Venture plans and participate in waterfowl habitat enhancement on the DIWA. POTENTIAL FUNDING: Grants when successful, WDFW, Ducks Unlimited.

TIMEFRAME: Ongoing grant search and application.

**B. Strategy:** Maintain existing “goose” tubs – metal wash tubs placed on platforms or in trees for Canada geese to nest in and Wood Duck nest boxes. POTENTIAL FUNDING: Nest Structures (Federal Aid), Grants when successful, Ducks Unlimited, Oroville Gun and Sportsmen’s Club, volunteers. TIMEFRAME: Annual Ongoing.

**C. Strategy:** Install additional “goose” tubs and Wood duck nest boxes.

POTENTIAL FUNDING: Nest Structures (Federal Aid), Grants when successful, Ducks Unlimited, Oroville Gun and Sportsmen’s Club, volunteers. TIMEFRAME: Annual Ongoing.

**D. Strategy:** Maintain a minimum of 20 acres of cropped alfalfa to provide forage for Canada geese. FUNDING: Maintain forage (Federal Aid). TIMEFRAME: Ongoing.

**E. Strategy:** Experiment with prescribed burns to improve foraging habitat quality for Canada geese and create a mosaic of vegetation in various successional stages.

POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, USFS, DNR, USFWS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

### **3. Manage for migratory upland game birds**

#### Mourning Dove, Band-tailed Pigeon, Coot, and Snipe

Mourning doves and snipe use DIWA for nesting and brood rearing. Snipe likely use DIWA year round whereas mourning doves are present during spring summer and fall. However, a small number of mourning doves have been present on DIWA on a year round basis. Band-tailed pigeons have not been documented on the DIWA. Mourning dove hunting is not a big draw to the DIWA, but more doves are likely to be encountered than snipe hunters.

The Game Management Plan Statewide Goals for mourning doves, band-tailed pigeons, coots, and snipe call for:

- “1. Manage statewide populations of mourning doves, band-tailed pigeons, coots, and snipe for a sustained yield consistent with Pacific Flyway management goals.
2. Manage mourning doves, band-tailed pigeons, coots, and snipe for a variety of recreational, educational and aesthetic purposes including hunting, scientific study, cultural and ceremonial uses by Native Americans, wildlife viewing and photography.
3. Preserve, protect, perpetuate, and manage mourning doves, band-tailed pigeons, coots, and snipe and their habitats to ensure healthy, productive populations. “

Habitat Management Issue Statement:



Habitats for mourning doves, band-tailed pigeons, coots, and snipe are being lost throughout Washington due to development and conversion to other uses.

Objective 122 under mourning doves, band-tailed pigeons, coots, and snipe management states:

Quantify and reduce habitat loss by developing habitat maps and management guidelines. The strategies under Objective 122 are listed as:

a. Provide resource information to other agencies and organizations to influence land use decisions (e.g., WDFW Priority Habitats and Species (PHS) management guidelines for band-tails) (ongoing).

b. In cooperation with other agencies, track critical habitat status and trends (e.g., mineral sites, freshwater wetlands) (ongoing). (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: Assist in efforts to determine and track critical mourning doves and snipe habitat status on DIWA. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

Objective 123 under mourning doves, band-tailed pigeons, coots, and snipe management states:

Provide funding through state migratory bird stamp/print revenues to protect/enhance 50 acres of habitat annually for doves, pigeons, coots, and snipe.

The strategies under Objective 123 are listed as:

a. Determine habitat protection and enhancement needs considering literature and regional expertise.

b. Solicit project proposals from regional staff and external organizations.

c. Develop expenditure plan before the start of each new biennium, using an evaluation team from a statewide cross-section of Department experts, to fulfill funding requirements for non-waterfowl migratory birds specified in legislation.

d. Monitor effectiveness of habitat projects through focused evaluation projects before and after implementation. (Washington Department of Fish and Wildlife Game Management Plan. 2003)

B. Strategy: Assist in efforts to determine mourning doves and snipe habitat protection and enhancement needs on DIWA. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

C. Strategy: Provide opportunities for mourning doves and snipe habitat projects on the DIWA. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

Information and Education Issue Statement:

Members of the general public and recreational users are sometimes uninformed about management issues and hunting opportunities.

Objective 129 under mourning doves, band-tailed pigeons, coots, and snipe management states:

Generate at least one information and education product each year to improve transfer of information to public.

The strategies under Objective 129 are listed as:

a. Increase public awareness about management issues through brochures, news releases, Internet, pamphlets (ongoing).

b. Develop materials describing hunting opportunities for other migratory game birds in Washington (ongoing). (Washington Department of Fish and Wildlife Game Management Plan. 2003)

D. Strategy: Assist in the transfer of information about mourning doves, band-tailed pigeons, coots and snipes and their management by posting information or adding a link to the DIWA website. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

E. Strategy: Assist in developing materials describing hunting opportunities for mourning doves and snipe on DIWA. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

#### **4. Manage for wild turkey**

Wild turkeys have been observed flying onto and roosting on Driscoll Island during late winter and early spring. No other observations of wild turkeys using DIWA have been documented. If wild turkey were present on DIWA during the hunting season the opportunity would be extremely limited due to accessibility since the water level is usually up when wild turkey season is ongoing. Opportunity for wild turkey management on DIWA is extremely limited.

#### **5. Manage for forest grouse**

Only one species of forest grouse, ruffed grouse, is known to use DIWA with ruffed grouse. Blue grouse may use DIWA for nesting and brood rearing, but it would be limited. Forest grouse hunting on DIWA is primarily incidental to hunting for California quail and Ring-necked pheasant.

The Game Management Plan Statewide Goals for forest grouse call for:

1. Preserve, protect, perpetuate, and manage forest grouse and their habitats to ensure healthy, productive populations.
2. Manage forest grouse for a variety of recreational, educational and aesthetic purposes including hunting, scientific study, wildlife viewing, cultural and ceremonial uses by tribes, and photography.
3. Manage statewide forest grouse populations for a sustained harvest.

Habitat Management Issue Statement:

Forest grouse habitat quality is tied directly to forest management strategies implemented on public and private lands.

As new information about forest grouse management becomes available, it is important to make that information available to forest managers.

Objective 146 under forest grouse management states:

Develop one additional habitat management publication by 2008.

The strategies under Objective 146 are listed as:

- a. Review forest grouse literature concerning forest management techniques.
- b. Update existing or create additional forest grouse habitat management guidelines.
- c. Make guidelines available to forest landowners and encourage them to incorporate management practices that benefit forest grouse. (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: Assist in developing forest grouse habitat management techniques and guidelines on DIWA for application on other forest lands. POTENTIAL FUNDING: Agency Support (Federal Aid), Grants when successful, Ruffed Grouse Society,

graduate students, interns, qualified volunteers. TIMEFRAME: Ongoing grant search and application.

**B. Strategy:** Enhance ruffed grouse habitat by increasing the riparian vegetation component on DIWA. POTENTIAL FUNDING: Agency Support (Federal Aid), Grants when successful, Ruffed Grouse Society, graduate students, interns, qualified volunteers. TIMEFRAME: Ongoing grant search and application.

**C. Strategy:** Experiment with prescribed burning to increase habitat diversity by encouraging early successional vegetation patches on DIWA. POTENTIAL FUNDING: Grants when successful, Ruffed Grouse Society, graduate students, interns, qualified volunteers. TIMEFRAME: Ongoing grant search and application.

## **6. Manage for upland game birds**

Upland game birds found on the DIWA include Hungarian partridge, Ring-necked pheasant, and California quail. The California quail and Hungarian partridge on DIWA are progeny of released birds. Through a pheasant release program, pen raised Ring-necked pheasants are being released during hunting season on DIWA. DIWA is a popular destination for upland bird hunters who don't mind wading across the ford.

The Game Management Plan Statewide Goals for upland game birds call for:

“1. Preserve, protect, perpetuate, and manage upland game birds and their habitats to ensure healthy, productive populations.

2. Manage upland game birds for a variety of recreational, educational and aesthetic purposes including hunting, scientific study, wildlife viewing cultural and ceremonial uses by Native Americans, and photography.

3. Manage statewide upland game bird populations for a sustained harvest.”

Habitat Management Issue Statement:

Pheasant habitat in eastern Washington has been lost, altered or degraded over the past 50 years. This is considered to be a major factor in the decline in pheasant populations (Flaherty 1979).

Objective 153 under upland game bird management states:

By 2008, increase the quantity and quality of pheasant habitat in select WDFW districts within identified key pheasant management areas.

The strategies under Objective 153 are listed as:

a. Inventory current pheasant habitat and identify and prioritize key areas for improvement.

b. Define quality pheasant habitat.

c. Develop specific strategies for enhancing pheasant habitat.

d. Purchase high priority pheasant habitat acreage using funds from the sale of western Washington land holdings identified for that purpose.

e. Work with public and private landowners and funding agencies (e.g.

United States Department of Agriculture (USDA)) to increase quality pheasant habitat acreage through programs like the Conservation Reserve Program (CRP), and the Wildlife Habitat Incentives Program (WHIP).

f. Improve pheasant habitat quality by funding habitat improvement projects through the Eastern Washington Pheasant Enhancement Program (EWPEP).

g. Integrate pheasant habitat improvements and priorities with native species needs (e.g. sharp-tailed grouse and salmon). (Washington Department of Fish and Wildlife Game Management Plan. 2003)

**A. Strategy:** Assist in development of specific strategies for enhancing upland bird habitat on the DIWA. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

**B. Strategy:** Seek funding for upland bird habitat enhancement on the DIWA. POTENTIAL FUNDING: Grants when successful. TIMEFRAME: Ongoing grant search and application.

**C. Strategy:** Continue to provide standing grains for upland game bird feed as part of the sharecropping program on DIWA. FUNDING: Maintain Forage (Federal Aid). TIMEFRAME: Ongoing.

**D. Strategy:** Continue to maintain and fill a minimum of 6 upland game bird feeders on DIWA. POTENTIAL FUNDING: Winter Feeding (Federal Aid). TIMEFRAME: Ongoing.

**E. Strategy:** Maintain adequate amounts of trees and brush to meet the foraging and cover needs of upland birds. POTENTIAL FUNDING: Grants when successful, volunteers. TIMEFRAME: Ongoing grant search and application.

**F. Strategy:** Experiment with prescribed burns to improve habitat quality for Upland birds and create a mosaic of vegetation in various successional stages. POTENTIAL FUNDING: Grants when successful, Ruffed Grouse Society, graduate students, interns, qualified volunteers, Agency Support (Federal Aid). TIMEFRAME: Ongoing grant search and application.

## **7. Manage for small game, furbearers, and Unclassified Species**

There are many small game, furbearers and unclassified species on the DIWA including bobcats, coyotes, muskrats, beaver, mink, long-tailed weasel, raccoon, river otter, etc. Due to access and the restriction on the use of body gripping traps trapping efforts on DIWA is very low. However, all of these species can provide wildlife viewing opportunity.

The statewide goals for small game mammals, furbearers, and unclassified wildlife are:

1. Preserve, protect, perpetuate, and manage species and their habitats to ensure healthy, productive populations
2. Manage wildlife species for a variety of recreational, educational and aesthetic purposes including hunting, trapping, scientific study, cultural and ceremonial uses by Native Americans, wildlife viewing and photography.
3. Manage statewide populations for a sustained yield.

Population Management Issue Statement:

There is little documentation on the current distribution and relative densities of individual small game and furbearer species in Washington.

Objective 168 small game mammals, furbearers, and unclassified wildlife states: “Revise the distribution map for all small game and furbearer species by 2008.”

The strategies under Objective 168 are listed as:

a. missing from Game Management Plan

b. missing from Game Management Plan

c. Revise the distribution maps using Priority Habitats and Species (PHS) protocols.

d. Revise the distribution maps from harvest and trapping data, sightings, and regional biologist interpretations.

e. Revise the distribution maps from survey and ground truthing activities. (Washington Department of Fish and Wildlife Game Management Plan. 2003)

**A. Strategy:** Assist in revising distribution maps of small game, furbearers and unclassified species on the DIWA. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

**B. Strategy:** Provide viewing opportunity of the small game, furbearer and Unclassified wildlife. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing grant search and application.

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

Channels of the Okanogan and Similkameen Rivers, which provide migration, spawning and rearing habitat for the ESA-listed endangered Upper Columbia River steelhead, surrounding the DIWA. In addition, Okanogan/Similkameen summer Chinook, Okanogan River Sockeye, and other resident game fish utilize the area.

The Upper Columbia Salmon Recovery Board (UCSRB), established by the Salmon Recovery Planning Act in 1998, is responsible for developing Salmon Recovery Plans for the Okanogan watershed in addition to other watersheds. Management of DIWA will be consistent with these plans.

The anadromous species are present at some point during the year, in the channels surrounding Driscoll Island, in one life stage or another. It is assumed that other aquatic life will benefit from managing toward suitable conditions for these species, due to their wide range of habitat requisites. The most common limiting factors for both Upper Columbia steelhead and Fall Chinook are habitat diversity, sediment load, and quantity of key habitats for various life stages. A list of fish species found in the waters around Driscoll Island can be found in (**appendix 6**).

**A. Strategy:** Work with Colville Confederated tribes, other landowners, Federal Agencies, State Agencies, i. e., Salmon Recovery Funding Board; Non-government Organizations, e.g., Upper Columbia Regional Fisheries Enhancement Group, to restore floodplain and riparian functionality to the portion of the river systems of which DIWA is a part. POTENTIAL FUNDING: Grants when successful, volunteers, USWFS, NOAA, Colville Tribe. TIMEFRAME: Ongoing grant search and application, coordination and collaboration with groups.

**B. Strategy:** Restore riparian vegetation with shrub and tree plantings along the shorelines of Driscoll Island. POTENTIAL FUNDING: Grants when successful, volunteers, USWFS, NOAA, Colville Tribe. TIMEFRAME: Ongoing grant search and application, coordination and collaboration with groups.

**C. Strategy:** Improve instream habitat for salmonid species and other indigenous fish species. POTENTIAL FUNDING: Grants when successful, volunteers, USWFS, NOAA, Colville Tribe. TIMEFRAME: Ongoing grant search and application, coordination and collaboration with groups.

**D. Strategy:** Seek funding to improve salmonid fish habitat on and adjacent to DIWA. FUNDING: Grants when successful, volunteers, USWFS, NOAA, Colville Tribe. TIMEFRAME: Ongoing grant search and application, coordination and collaboration with groups.

**E. Strategy:** Provide for fishing access during fisheries for non-listed species. FUNDING: Grants when successful, volunteers, USWFS, NOAA, Colville Tribe. TIMEFRAME: Ongoing grant search and application, coordination and collaboration with groups.

## 9. Manage for species diversity

Most if not all wildlife are dependent on some form of plant life either directly or indirectly. Some species are totally dependent on a specific genus or species of vegetation. It is important to know the species of plant life in order to better manage for a diversity of wildlife. Additionally, to manage for species diversity it is necessary to know what species are present and where they are in order to provide maximal consideration for them. Lists of birds, mammals, herptiles, fishes, butterflies and other species are under construction for the DIWA, **Appendix 6**. These lists will include species known to occur on the DIWA as well as species that may occur, but have not been verified. Anecdotal presence/absence surveys have been ongoing on the DIWA for the last 4 years. Once comprehensive surveys have been completed, develop and/or maintain quality habitat that will provide life requisites for the species present. Nearly all activities on DIWA benefit a diversity of species. *Birds in general – people have an interest in seeing a variety of birds – bird watching can provide positive economic benefits.*

**A. Strategy:** Determine Diversity Species use by performing surveys for breeding nongame birds, reptiles and amphibians, small mammals, aquatic and terrestrial mollusks, Odonata and butterflies or explain what general rules will apply so as not to indirectly create threats to intrinsic species. POTENTIAL FUNDING: Agency Support (Federal Aid), Grants when successful, volunteers, graduate students, students, interns, assistance from other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**B. Strategy:** Develop GIS layers depicting distribution of species on the DIWA. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**C. Strategy:** Determine ecological processes that historically maintained the habitat upon which diversity species depended and attempt to manage for those processes. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**D. Strategy:** Conduct a complete and comprehensive vascular plant survey, club moss, bryophyte and lichen survey. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

## 10. 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. Fire exclusion in riparian areas has resulted in a stagnation of vegetative succession and reduced the mosaic effect that contributes to increased diversity necessary for sustaining a variety of species.

**A. Strategy:** See also Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objective 8.

**B. Strategy:** Work with Area and Field Wildlife Biologists to identify riparian areas for additional restoration or protection. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, interns, assistance from other

agencies, i.e., BLM, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**C. Strategy:** Use prescribed fire to return the fire effects component to riparian ecosystem to increase diversity of plant communities and wildlife. POTENTIAL

FUNDING: Grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, assistance from other WDFW personnel.

TIMEFRAME: Ongoing grant search and application.

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

The agency has prioritized shrub-steppe habitat management and protection. Shrub steppe areas provide habitat for a diversity of fish and wildlife species and for comparatively high densities of animals. Shrub steppe is also very vulnerable to habitat conversion and alteration practices. There is very little shrub steppe habitat on the DIWA, most of it is on a sliver parcel between the east shore of the east channel and the railroad right-of-way.

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

POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

## **12. Protect and maintain prescriptive grazing, agricultural and forest practices as tools for manipulating and managing vegetation and cover-types to benefit fish and wildlife**

Washington Department of Fish and Wildlife, as owner and manager of lands is in a position and has a unique opportunity to demonstrate through responsible management, how lands can be managed to benefit fish and wildlife using prescriptive grazing, logging and agricultural practices as part of the management program to maintaining healthy fish and wildlife populations and habitat. WDFW can lead the way in this endeavor.

However, in the case of DIWA, prescriptive grazing will not be a part of the management of DIWA unless year round access is possible. *Timber management – fuels management and prescribed (Rx) burning, Income can help program. Grazing – restore economically and environmentally sustainable grazing using grazing plans, fencing, water, supplements, etc.*

**A. Strategy:** Continue to provide opportunities for prescribed grazing as a tool to manage vegetation to benefit wildlife. This will not be possible unless year round access is possible. FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, assistance from other agencies, i.e., USFS, BLM, USFWS, other organizations, assistance from other qualified WDFW personnel. TIMEFRAME: Ongoing, grant search and application.

**B. Strategy:** Continue to provide agricultural lease opportunities for sharecroppers where crops will provide diversity and concentrations of feed for wildlife species. FUNDING: Forage (Federal Aid), Sate Wildlife Account, grants when successful, interns, assistance from other agencies, i.e., USFS, NRCS, BLM, USFWS and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

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

A primary management effort in “protecting” habitat involves recognition and perpetuation of historic disturbance regimes that were the engines, which influenced the conditions in which indigenous fauna and flora evolved. By assuring that those disturbance regimes, fire and flooding, will continue to be a part of the ecosystem. Fire was an historically significant disturbance regime for thousands of years until about 100 years ago. Fire dependent plant communities and wildlife dependent thereon will continue to exist. It is assumed that most other habitat management activities and efforts will benefit if this disturbance regime is perpetuated. The flooding disturbance regime was altered when the river channels were riprapped and channelized. Removal of riprap and restoration of meandering channels, with instream structures, will contribute to restoration of habitat for many species and in particular the Endangered\* Upper Columbia Steelhead, the Fall Chinook and the Osoyoos Sockeye salmon.

**\*At the Federal level the Endangered Species Act of 1973 defines "endangered" as "any species which is in danger of extinction throughout all or a significant portion of its range." "Threatened" is defined as "any species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range." What is the Federal Endangered Species Act (ESA)?**

**The Endangered Species Act (ESA) is a law enacted in 1973 for this purpose:**

- 1. To identify animals and plants that are in trouble.**
- 2. To protect these plants and animal and their habitat.**

**What is the difference between a State listed species and a Federally listed species?**

**States determine standards for listing species that live within the borders of their state regardless of how rare or common they are outside those borders. A Federally listed species must be threatened or endangered throughout all or a significant portion of the geographic range in which it lives.**

**At the State level the definitions are essentially the same, but apply to species, as they exist within the boundaries of a state regardless of the population status outside the state. A species, after scientific review, may be designated as Threatened, Endangered or Sensitive Species of Concern (T, E, S) at the state level.**

**A. Strategy: Work with Area and Field Wildlife and Area Fish Biologist determine what species may be of special significance and develop management plans to address them.** POTENTIAL FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., USFS, USFWS, BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**B. Strategy: Protect nesting and foraging habitat for several woodpecker species. Protect and create snags.** POTENTIAL FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., USFS, USFWS, BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application

**C. Strategy: Conduct prescribed burning on an average of 20 acres per year for a 10-year rotation to improve habitat diversity and quality.** POTENTIAL FUNDING: Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., USFS, BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.



**D. Strategy:** See also Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objective 8.

**14. Conduct research to determine management strategy 1) impacts to other resources, 2) effectiveness relative to objectives, 3) costs, and 4) benefits**

Wildlife Area managers are “Disturbance Managers” in that they can use disturbance agents, i.e., fire, chainsaws, domestic livestock, etc., to influence plant communities in a manner to meet defined objectives to influence wildlife use or make environmental modifications (disturbances) to influence wildlife use, i.e., water impoundments, artificial nest structures, food plots, etc. Management strategies may benefit one species while negatively impacting another, i.e., species dependent primarily on late successional plant communities won’t benefit from management strategies designed to convert plant communities to early successional stages. In some cases management strategies don’t meet objectives or provide little benefit, i.e., upland bird guzzlers. Research is needed to identify relationships of wildlife with various habitat disturbance regimes including the class, the duration, the frequency, the spatial relationships and the magnitude/severity of the disturbance, e.g., fire, domestic livestock grazing, logging, recreational activities, roads, etc. Domestic livestock grazing is often a contentious issue that needs scientific scrutiny to support the use of grazing. Alteration of historic disturbance regimes, e.g., fire, flooding, resulting in changes to habitat dynamics needs to be addressed. To begin, an assessment of what the historic disturbance regimes were, their dynamics and what the plant communities likely existed under those regimes will provide “target” plant communities and plant community spatial and temporal dynamics. Using these target plant communities adaptive management strategies can be developed, implemented and changed according to measured responses of wildlife to the changes. Additionally there is a need for: 1) more information on what wildlife species use the DIWA, 2) what their habitat requirements are, 3) a complete soil survey of the DIWA.

**A.** See Agency Objective: Develop , integrate and disseminate sound fish, wildlife and habitat science.

**B. Strategy:** Coordinate with the Wildlife Program and Habitat Science Divisions to develop, design and prioritize research projects, and find funding and researchers to meet research needs. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., USFS, USFWS, BLM, NRCS, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing grant search and application.

**C. Strategy:** Seek funding to research impacts, positive or negative, of domestic livestock grazing so that undisputable facts are known when making decisions to use or not use, how much, when and where, domestic livestock grazing. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., BLM, NRCS, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing grant search and application.

**D. Strategy:** Continue to seek funding for conducting research on historic disturbance regimes to determine the frequency, spatial relationships and the magnitude/severity of the disturbances and how they maintained habitat features and attributes needed by indigenous wildlife species. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance

from other agencies, i.e., BLM, NRCS, assistance from other WDFW personnel.

TIMEFRAME: Ongoing grant search and application.

**E. Strategy:** Seek funding to determine cost and benefits of environmental modification, e.g., artificial nest structures, upland bird guzzlers, and etc. strategies.

POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., BLM, USFWS, other organizations, e.g., Ducks Unlimited, Blue Bird Society, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**F. Strategy:** Seek funding to inventory all species of wildlife on the DIWA including generalized habitat requirements.

POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., BLM, USFWS assistance from other WDFW personnel.

TIMEFRAME: Ongoing grant search and application.

**G. Strategy:** Seek funding and/or provide encouragement to the NRCS soil survey shop to complete the soil survey for the DIWA.

POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, assistance from other WDFW personnel.

TIMEFRAME: Ongoing grant search and application.

**H. Strategy:** Maintain contact with educational institutions, i.e., Colleges,

Universities and Community Colleges, High Schools, to provide opportunities for students and interns to conduct research on the DIWA that will increase knowledge about the DIWA and contribute to management of the DIWA. FUNDING: Ongoing.

TIMEFRAME: Ongoing.

**Agency Objective: Influence the decisions of others that affect fish, wildlife and their habitats.**

Washington Department of Fish and Wildlife, as owner and manager of lands is in a position and has a unique opportunity to demonstrate through responsible management, how lands can be managed to benefit fish and wildlife and have grazing, logging and agricultural activities as part of the management. WDFW can lead the way in this endeavor. *Timber management – fuels management and prescribed (Rx) burning, Income can help program. Grazing – restore economically and environmentally sustainable grazing using grazing plans, fencing, water, supplements, etc.*

**1. Provide the DIWA as a model, demonstrating cost effective responsible land management practices that benefit fish and wildlife, for other private, county, state and federal land managers to follow.**

**A. Strategy:** Work with other local private, county, state and federal land managers to share knowledge about cost effective responsible management practices that benefit fish and wildlife.

POTENTIAL FUNDING: Ongoing. TIMEFRAME: Ongoing.

**B. Strategy:** Continue to seek ways to be more cost effective in implementing land management practices that benefit fish and wildlife. FUNDING: Ongoing.

TIMEFRAME: Ongoing.

**C. Strategy:** Continue to strive to be a good model of cost effective responsible land management that benefits fish and wildlife. POTENTIAL FUNDING: Ongoing.

TIMEFRAME: Ongoing.

**D. Strategy:** Develop and provide educational “Field Day” opportunities demonstrating land/vegetation management techniques that are fish and wildlife friendly. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**E. Strategy:** Continue to participate in Coordinated Resource Management process. FUNDING: Ongoing. TIMEFRAME: Ongoing.

**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.**

Washington Department of Fish and Wildlife, as owner and manager of lands is in a position to provide a diversity of wildlife-oriented experiences in a manner that is not detrimental to management of or the protection of the fish and wildlife or the habitat.

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

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

**A. Strategy:** Provide access to DIWA in the form of a footbridge at minimum, preferably a bridge that can accommodate service vehicles and equipment that can also be used as a footbridge. POTENTIAL FUNDING: Grants when successful, Capitol projects. TIMEFRAME: Ongoing grant search and application.

**B. Strategy:** Sign all entry roads with rules on use and recreational use on the DIWA. POTENTIAL FUNDING: Signs (Federal Aid), grants when successful, assistance from other WDFW personnel, e.g., WCC. TIMEFRAME: Ongoing grant search and application.

**C. Strategy:** Provide fishing and wildlife viewing opportunities for persons with disabilities. POTENTIAL FUNDING: Grants when successful, qualified volunteers, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**D. Strategy:** Provide trails for hunting, fishing, hiking, walking, horseback riding, bird watching, wildflower viewing, butterfly watching, interpretive and sightseeing opportunities compatible with wildlife. POTENTIAL FUNDING: Grants when successful, qualified volunteers, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**E. Strategy:** Provide self guided interpretive tours, including kiosks, reader boards, pamphlets and brochures, on the DIWA to help the public better understand fish and wildlife habitat management including farming, domestic stock grazing, fuels treatments and prescribed burning, and the ecological processes that sustain fish and wildlife habitat. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, USFS, DNR, etc. other organizations TNC, Audubon Society,

Oroville Sports Club, Okanogan Wildlife Council, Okanogan County Tourism Council, Okanogan County Cattlemen's Association, etc., assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**F. Strategy:** Develop maps, brochures and pamphlets of the DIWA for issuance to the public. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, USFS, DNR, etc. other organizations TNC, Audubon Society, Oroville Sports Club, Okanogan Wildlife Council, Okanogan County Tourism Council, etc., assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**G. Strategy:** Develop a GIS layer depicting all roads on the DIWA. FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**H. Strategy:** Develop a GIS layer depicting all trails on the DIWA indicating their use status and condition. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**I. Strategy:** Develop GIS layer(s) depicting all facilities, toilets, parking areas and boat launches indicating their use status and condition. FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**J. Strategy:** Provide access and information for water trails and paddle sports opportunities on the river channels around DIWA (RJR & Associates, 2004). FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**K. Strategy:** Develop ADA and non-ADA trails and facilities to enhance fish and wildlife recreational opportunities. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: ongoing grant search and application.

**L. Strategy:** Work to provide hiking and viewing opportunities on DIWA. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: ongoing grant search and application.

## **2. Provide commercial opportunities compatible with fish, wildlife protection and habitat management.**

**A. Strategy:** Use proven contractors to implement prescribed burns. POTENTIAL FUNDING: Grants when successful, assistance from other agencies, i.e., USFS, BLM, and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**B. Strategy:** Continue to provide agricultural lease opportunities for sharecroppers where crops will provide diversity and concentrations of feed for wildlife species. FUNDING: Forage (Federal Aid). TIMEFRAME: Ongoing.

**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**

Federal, State, County and local laws protecting fish, wildlife and their habitat govern WDFW activities. As a leader in enforcing and seeking compliance with laws for protecting fish, wildlife and their habitat it is imperative WDFW ensure that its own activities are not contrary to its stated mission.

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

Weed control is required by state law to protect public economic and natural resources.

Invasive weeds are one of the greatest threats to fish and wildlife habitat quality.

Cooperative weed efforts are encouraged to improve efficacy and to minimize impacts on adjacent landowners as part of the agencies good-neighbor priority.

**A. Strategy:** Produce and implement weed management plan to include weed identification and inventory, risk/threat, control priorities, and monitoring (**appendix 2**). FUNDING: Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., NRCS, BLM, other organizations Okanogan County Noxious Weed Office/Board, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**B. Strategy:** Coordinate weed efforts with federal, state and local entities to improve efficacy and minimize costs. FUNDING: Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., USFS, DNR, NRCS, BLM, and other organizations Renton Fish and Game Club, Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**C. Strategy:** Continue to use Integrated Pest Management strategies, including biological control, chemicals, mechanical and cultural methods, to control invasive weeds. FUNDING: Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., USFS, NRCS, BLM, other organizations Quad County Weed Control Initiative, Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**D. Strategy:** Continue to control weeds along all roads on the DIWA - TBD miles of roads to reduce the spread of weeds. FUNDING: Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., DNR, BLM, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**E. Strategy:** Map all weed locations using GPS to create GIS layers showing all locations of weeds and to assist in monitoring weed control efforts. FUNDING: Grants when successful, qualified volunteers, students, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**F.** Strategy: Continue to use volunteers and volunteer work parties, e.g., Americorp, Oroville Gun and Sportsmen's Club, Renton Fish and Game Club, for cutting and pulling weeds. FUNDING: Grants when successful, qualified volunteers, students, interns, assistance from other agencies and other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**G.** Strategy: Work with the WDFW Contracts Office to obtain a contract with Okanogan County jail to allow use of trustee work crews to cut and pull weeds. FUNDING: Program Administration, Grants when successful. TIMEFRAME: **COMPLETED 2006.**

**H.** Strategy: Continue to seek funding to assure a 9-month FTE dedicated to weed control on the DIWA, SWA and CWA. FUNDING: Grants when successful, assistance from other agencies, i.e., NRCS, BLM, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**I.** Strategy: Continue to use WCC crews to control weeds. FUNDING: Grants when successful, assistance from other agencies, i.e., DNR, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**J.** Strategy: Use Okanogan County Jail Trustees for weed control and fence maintenance efforts. FUNDING: Grants when successful, assistance from other agencies, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

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

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

**A.** Strategy: Map all ESA species and their habitats on the DIWA and develop GIS layers depicting the location, species and habitat. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**B.** Strategy: List specific management practices associated with ESA species present or likely present. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., USFS, USFWS, NRCS, BLM, and other organizations, e.g., TNC, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**C.** Strategy: Inventory all roads to identify sedimentation and passage issues. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**D. Strategy:** Develop fuels treatment, e.g., prescribed burn plans with considerations for ESA species present or likely present. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., USFS, USFWS, NRCS, BLM, other organizations, e.g., TNC, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**F. Strategy:** Protect buffers adjacent to wetlands and riparian habitat. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

### **3. Provide fire management on agency lands (appendix 3)**

Fire suppression agreements must exist for all agency lands to protect the people of Washington and to protect natural and economic resources of the agency and adjacent landowners from wildfire. Prescribed burning must be integrated into routine habitat management of the DIWA to ensure continued habitat dynamics associated with fire and sustenance of fire-dependent species as well as fuels reduction.

**A. Strategy:** Contract with local, state or federal entities to provide wildfire suppression support on the DIWA. POTENTIAL FUNDING: Grants when successful, assistance from other agencies, i.e., USFS, NRCS, BLM, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**B. Strategy:** Provide fire training for wildlife area manager and assistant manager. Develop a list of fire responsible individuals. POTENTIAL FUNDING: Grants when successful, assistance from other agencies, i.e., USFS, DNR, BLM, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**C. Strategy:** Develop a GIS layer depicting fuels treatment and prescribed burn units. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., USFS, USFWS, NRCS, BLM, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**E. Strategy:** Develop and implement fuels treatment prescriptions and prescribed burn plans to reduce potential severity of wildfires. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., USFS, USFWS, NRCS, BLM, DNR other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**F. Strategy:** Develop protocol and mechanisms necessary to conduct and/or contract for prescribed burning to reduce time and effort spent in bureaucratic quagmires involving uncooperative, unknowledgeable and uncaring individuals. POTENTIAL FUNDING: Grants when successful, qualified volunteers, assistance from other agencies, i.e., USFS, USFWS, NRCS, BLM, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

#### **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 of all structures before renovation or removal. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., Okanogan County Historical Society, OAHP, NRCS, BLM, USFS, Colville Confederated Tribes, other organizations, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**B. Strategy:** Perform cultural resource survey and assessment before digging- including posts for new fence line, parking lots, toilets, buildings, new agricultural fields, etc. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., OAHP, NRCS, BLM, USFS, Colville Confederated Tribes, other organizations, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**C. Strategy:** Obtain funding to initiate a complete and comprehensive cultural resources survey for the DIWA. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., Okanogan County Historical Society, NRCS, BLM, USFS, Colville Confederated Tribes, OHAP, other organizations assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**D. Strategy:** Map all cultural resources on the DIWA and develop a GIS layer depicting the location and type of cultural resources. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., OHAP, NRCS, BLM, USFS, Colville Confederated Tribes, other organizations, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**E. Strategy:** Assess cultural resources for wildlife values, i.e., bats, Vaux's swifts, for wildlife values before renovation or removal. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., BLM, other organizations, e.g., Audubon, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**F. Strategy:** Work with Okanogan County Historical Society and others to develop plans and obtain funding for cultural resources to be preserved and protected. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., BLM, other organizations, e.g., Audubon, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

#### **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. **FUNDING:** State Wildlife Account. **TIMEFRAME:** Annually.



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

Good business practices maximizing accomplishments with the limited funds available for managing the DIWA is expected and demanded by the public, WDFW Administration, Legislature and the Governor's office. It is essential to: 1) provide a safe working conditions for employees, 2) know where the property lines are for jurisdictional and management purposes and 3) know what facilities exist with their location for planning future maintenance needs.

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

**A. Strategy:** Obtain funding to get all boundary lines of the DIAWA surveyed, marked and/or fenced. **POTENTIAL FUNDING:** State Wildlife Account, Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., BLM, USFS, other organizations, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing grant search and application.

**A. Strategy:** Collect GPS data and develop GIS data layers for all facilities and features including fences, gates, buildings, guzzlers, photo points, old garbage dumps, signs, cultural resources, springs, watering troughs, water pumps, wells, etc. **FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., Okanogan County Planning, other organizations, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application

**B. Strategy:** Develop a monthly, quarterly, semi-annual, annual or biennial routine maintenance schedule for fences, signs, water control structures, buildings, guzzlers, watering troughs, cattleguards, etc. **POTENTIAL FUNDING:** Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, students, interns, Assistance from other agencies, other organizations, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**C. Strategy:** Remove old unnecessary fences and downed fences. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., Okanogan County Jail, other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**D. Strategy:** Remove all old garbage dumps and scrap metal piles on the DIWA. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., DOE, BLM, other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel, e.g., WCC. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**E. Strategy:** Maintain roads to prevent resource damage and provide access. Maintain ford to allow vehicular access. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, assistance from other agencies, e.g., Okanogan County Road Dept., other organizations, assistance from other WDFW personnel, e.g., Lacey Construction crew. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**F. Strategy:** Work with Access Maintenance to maintain parking areas to prevent resource damage and provide access. Sign all parking lots. **POTENTIAL**

FUNDING: Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., IAC, other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel, WCC, Lacey Construction crew. TIMEFRAME: Ongoing, ongoing grant search and application.

**G.** Strategy: Using the DIWA Facility/Building Inventory Assessment, identify the five highest priority structures that need to be addressed based on safety issues. Work with engineering staff to schedule and complete work. Engineering should include a cultural resource and wildlife habitat value assessment for historic structures. Surplus any materials/structures to generate revenue prior to demolition or removal. POTENTIAL FUNDING: For demolition: Bid out to wood used lumber salvage companies, grants when successful, qualified volunteers. For cultural resource and wildlife value habitat assessment: grants when successful, graduate students, students, interns, assistance from other agencies, i.e., USFWS, BLM, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**H.** Strategy: Identify and explain other capital needs. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, Capitol projects. TIMEFRAME: Annually.

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

**A.** Strategy: In coordination with the Engineering Division, Construction Crew and Dam Maintenance Crew, maintain all gates, wells, irrigation systems to perform operation and maintenance of area. POTENTIAL FUNDING: State Wildlife Account, Grants when successful, qualified volunteers, assistance from other agencies, i.e., DNR, BLM, other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**B.** Strategy: Replace/install new boundary and unit signs. FUNDING: State Wildlife Account, Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., USFS, BLM, DNR, other organizations Oroville Gun and Sportsmen's Club, Okanogan Wildlife Council, assistance from other WDFW personnel, e.g., WCC. TIMEFRAME: Ongoing, ongoing grant search and application.

## **3. Maintain equipment**

**A.** Strategy: Service all equipment including trucks, tractor and implements, weed sprayers, trailers, etc. Request replacement equipment when needed. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, students, interns, assistance from other agencies, other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**B.** Strategy: Rent equipment when it is more efficient to do so or when needed. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, assistance from other agencies, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

#### **4. Pursue funding opportunities**

**A.** Strategy: Apply for grants and other funding opportunities consistent with planned priorities to supplement funding, e.g., NRCS – WHIP, CRMP, CCRMP, etc. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, qualified volunteers, graduate students, students, interns, assistance from other agencies, other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**B.** Strategy: Enroll lands in CRP and other federal programs to generate revenue and accomplish desired habitat conditions. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., NRCS, ASCS, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**C.** Strategy: Establish sharecropping agreements with neighbors to address artificial cultivation needs and generate additional revenue to support enhanced O&M. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, assistance from other agencies, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**D.** Strategy: Establish and maintain prescribed grazing permits with benefits being income, fences maintained and weeds controlled. FUNDING: Federal Aid, State Wildlife Account, qualified volunteers, assistance from other agencies, i.e., NRCS, BLM, assistance from other WDFW personnel. TIMEFRAME: Ongoing.

**E.** Strategy: Continue “Internship” program for student volunteers. FUNDING: Grants when successful, qualified volunteers, graduate students, students, assistance from other agencies, i.e., NRCS, BLM, USFS, USGS, USFWS, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**F.** Strategy: Seek out and develop partnerships with other government entities, e.g., tribal, federal, state, county and local agencies, e.g., Colville Confederated Tribes, USFWS, USFS, USGS, BLM, WaDNR, USGS, Okanogan County Noxious Weed Control Board, Okanogan County Sheriff’s Office Jail to maximize use of resources for completing projects. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, students, interns, assistance from other agencies, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**G.** Strategy: Seek out and develop partnerships with Non-government Organizations (NGO’s), e.g., The Nature Conservancy, Okanogan Valley Land Council, FNAWS, Washington Native Plant Society, Mule Deer Foundation, etc., to maximize use of resources for completing projects. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**H. Strategy:** Seek out and develop partnerships with National, Regional and local sports groups, e.g., Washington State Bow Hunters, Inland Empire Wildlife Council, Oroville Gun and Sportsmen's Club, Omak Fish and Game Club, Okanogan Wildlife Council, etc., to maximize use of resources for completing projects. **FUNDING:** Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, students, interns, assistance from other agencies, other organizations Oroville Gun and Sportsmen's Club, Okanogan Wildlife Council, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

## **5. Assess all plant communities and habitats in regards to fire suppression and altered flood plain regime**

The only forest on DIWA is forest associated with riparian areas, e.g., cottonwoods, willows, hawthorns, red osier dogwood, etc. however periodic fire undoubtedly contributed to the dynamics of the vegetation communities on DIWA, but on a less frequent basis than the surrounding shrub steppe plant communities. Nevertheless, the history of fire suppression has resulted in changed habitat conditions, e.g., forest tree densities far greater than historic levels, forest is encroaching into shrub-steppe, shrub-steppe shrub component has increased over historic levels, early and mid successional plant communities are a very small part of all of the habitat, many fire dependent plants species are dying out, fire effects from the frequent fire regime have been absent for nearly 100 years. Additionally these changed conditions lead to other conditions symptomatic of a dysfunctional fire dependent ecosystem, e.g., increased risk of stand replacing fire events, increased levels of forest insects and diseases. Periodic flooding was an historic important disturbance regime that has now been altered on the DIWA.

**A. Strategy:** Conduct as best as feasibly possible a comprehensive fire history analysis of the DIWA with a report on the historic fire regime and GIS layer maps depicting acreages and areas of each of the historic fires detected. This will provide a better understanding of the historic fire regime on the DIWA to enable development of management plans for fuels treatment and mimicking the historic fire regime. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, USFS, USGS, other organizations, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**B. Strategy:** Determine and develop GIS layers, from historic aerial photos, as best as possible, the historic plant communities on DWIA. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, other organizations, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**C. Strategy:** Develop plans to address "restoration" of the Fire Dependent Ecosystem on the DIWA to benefit all species of wildlife dependent on a Fire Dependent ecosystem. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, USGS, USFS, other organizations, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

**D. Strategy:** Develop plans to address "restoration" of the flood plain functions on the DIWA to benefit all species of wildlife dependent on a functional flood plain

ecosystem. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, USGS, USFS, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

## **6. Perform administrative responsibilities**

Administrative responsibilities and duties are important business functions necessary for efficient use of resources in order to accomplish identified goals and objectives according to plans. Record keeping and monitoring are necessary to know where activities are in relation to the beginning and the end of plans or subparts of plans and what remains to be done as well as providing a basis for adaptive management, e.g., making changes to a plan based undesired/unplanned outcome from a management practice.

**A.** Strategy: Identify goals, objectives and tasks. FUNDING: Federal Aid, State Wildlife Account, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, USFS, other organizations, e.g., EOCCAG, TNC, Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**B.** Strategy: Develop and write plans based on identified goals and objectives. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, USFS other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**C.** Strategy: Develop and monitor budgets based on plans. FUNDING: Federal Aid, State Wildlife Account. TIMEFRAME: Ongoing.

**D.** Strategy: Supervise employees and provide ongoing training opportunity to staff. FUNDING: Federal Aid, State Wildlife Account. TIMEFRAME: Ongoing.

**E.** Strategy: Maintain files and records. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, students, interns, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**F.** Strategy: Monitor outcomes of tasks and projects in relation to stated objectives and goals. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**G.** Strategy: Write weekly, monthly and annual reports. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**H.** Strategy: Monitor compliance, renew grazing permits and agricultural leases. FUNDING: Federal Aid, State Wildlife Accounts, Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**I.** Strategy: Attend and participate in CRM meetings involving grazing permits on the DIWA or adjacent lands that could impact management on the DIWA. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified

volunteers, assistance from other agencies, i.e., NRCS, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**J.** Strategy: Write, update and implement wildlife area management plan, weed control plan and fire management plan. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, and assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**K.** Strategy: Conduct wildlife and habitat surveys. Identify and prioritize information and survey needs. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, interns, students, graduate students, assistance from other agencies, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**L.** Strategy: Manage an extensive equipment inventory used for habitat maintenance, enhancement, and restoration. FUNDING: Federal Aid, State Wildlife Account, Grants when successful. TIMEFRAME: Ongoing.

**M.** Strategy: Plan for and purchase supplies, tools and equipment. FUNDING: Federal Aid, State Wildlife Account, Grants when successful. TIMEFRAME: Ongoing.

**N.** Strategy: Attend meetings and meet with private individuals and agency representatives as needed. FUNDING: Federal Aid, State Wildlife Account, Grants when successful. TIMEFRAME: Ongoing

## **7. Protect and apply water rights for best use**

Water rights can impact wildlife area operations including food plots, restoration projects, etc. Water use can also reduce instream flows necessary to sustain fish and wildlife.

**A.** Strategy: Identify and record all water rights and uses of water (**APPENDIX 4**). FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., DOE, other organizations, e.g., Washington Water Trust, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**B.** Strategy: Move all unneeded water rights permanently or temporarily into the State Trust Water Rights Program. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, assistance from other agencies, i.e., DOE, other organizations Washington Water Trust, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

### **Agency Objective: Reconnect with those interested in Washington's fish and wildlife.**

The knowledge and experience of visitors to the DIWA could be enhanced regarding fish and wildlife habitat management by providing onsite interpretive trails and signs. When people visit the DIWA they may have questions about why certain things are being done or about the fish and wildlife and habitats on the DIWA. Other means of reconnecting with those interested can be through a Website and demonstration field days in conjunction with other agencies or organizations, i.e., USDA-FS, USDA-NRCS, USDI-BLM, USGS, WaDNR, FNAWS, Mule Deer Foundation, Okanogan Valley Land Council. *Route maps for wildlife watching with places to stop for rests and meals. Pullouts along roads in Wildlife areas. Interpretive trails on Wildlife Areas. Develop Informational fliers and have available*

at local businesses, agency offices or reader boards. More signs – interpretive signs, e.g., wildlife to see, explaining management activities

**1. Develop opportunities to educate and involve people interested in fish and wildlife habitat management.**

**A. Strategy:** Develop informational and educational materials, e.g., maps, pamphlets, brochures, self guided tours, birding and interpretive trails, interpretative center to educate people about the fish and wildlife of the DIWA and the processes that sustain the habitat that the fish and wildlife depend on. POTENTIAL

FUNDING: Federal Aid, State Wildlife Account, Watchable Wildlife Account, Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, USFWS, USFS, USGS, other organizations TNC, Audubon, Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**B. Strategy:** Develop programs and opportunities for college interns and other volunteers to work on the DIWA. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., WSU, EWU, CWU, UW, USU, other organizations TNC, Audubon, Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**C. Strategy:** Develop educational opportunities for local K-12 students and classes to be involved in projects on the DIWA. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., local and regional schools and colleges, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

**D. Strategy:** Develop opportunities for teachers and instructors to bring students, learning groups and others to visit the DIWA to learn about and experience fish and wildlife habitat management and observe fish and wildlife. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., local and regional schools and colleges, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

**E. Strategy:** Coordinate with Project WILD, Project Learning Tree, Adopt-A-Stream efforts. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., local and regional schools and colleges, other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

## **CHAPTER IV. PERFORMANCE MEASURES, MONITORING, EVALUATION AND UPDATES TO THE DIWA PLAN**

Wildlife area plan performance measures are listed below. Accomplishments and desired outcomes will be monitored and evaluated to produce an annual performance report. The wildlife area plan is a working document that will evolve as habitat and species conditions change, as new regulations are enacted, and as public issues and concerns change. Plan updates will address these changes.

### **1. The DIWA performance measures in 2006 include:**

- GPS and GIS map of all Dalmatian Toadflax, Plumeless Thistle, Russian knapweed and Common Tansy infestations and Russian Olive trees,.
- Continue weed control efforts using chemicals, hand pulling and biological control methods
- Remove all old scrap iron and metal.
- Maintain shrub planting irrigation system.
- Assess survival of shrubs and replace shrubs that died.
- GPS and GIS map all fences, bird feeders, structures, watering troughs, irrigation lines and wells.
- Monitor sharecropping to assure compliance with sharecropping lease.
- Prepare a trails grant application for DIWA
- Provide encouragement and assistance to keep Driscoll Island Bridge project with a bridge capable of holding a load consisting of a minimum of 15,000 lbs on track and moving
- Complete and/or review and update plans including WA plan, weed plan, and fire management plan



## APPENDIX 1. Public Issues

East Okanogan County Citizens Advisory Group (EOC CAG) and Okanogan District Team (ODT)  
Issues and Concerns

Driscoll Island Wildlife Area

March 9, 2005

The purpose of meeting with the EOC CAG and ODT was to obtain input to help guide management actions on the Driscoll Island Wildlife Area. A draft of the introduction and history of the wildlife area and copies of the Agency's goals and objectives were distributed for review and discussion. Below is a list of issues and concerns (I&C) identified by the EOC CAG and ODT. These issues were categorized. Issues specific to a particular Wildlife Area were deleted from the list for the areas they did not apply. Issues related to Wildlife Areas outside of the East Okanogan County Citizen's Advisory Group were passed on to the appropriate Wildlife Areas. Other issues related to Wildlife Management or General Agency issues were passed on to the appropriate program or person.

This input will assist in developing strategies to implement management goals and objectives. Underlined statements below indicate that the input was received from the ODT. Issues that are not underlined originated from the EOC CAG.

### Issue A. Access/Recreation

- Birds in general – people have an interest in seeing a variety of birds – bird watching can provide positive economic benefits.
- Route maps for wildlife watching with places to stop for rests and meals.
- Pull outs along roads in Wildlife areas.
- Develop Informational fliers and have available at local businesses, agency offices or reader boards.
- Bridge to Driscoll Island
- Interpretive trails on Wildlife Areas
- Develop a plan for trails on the wildlife areas and limiting them to the abandoned roadbeds. Reasoning would include managing public impact, noxious weeds, and erosion, which all can cause damage if poorly designed or user built trails start being allowed. The two old roadbeds are more than adequate trail access and are (or could easily be made) handicapped accessible. These old roadbeds will not create erosion, but would facilitate noxious weed management as part of the management plan. The County envisions a time when they would talk a trail from Fish Lake through Scotch Creek to the Conconully highway. It is an excellent chance to do educational kiosks on weed management, public impact etc.
- Planting more dumb pheasants as the natives are too hard to collect.
- Driscoll should be maintained as an island without a bridge to it. A bridge would increase human use too much.
- Trails? Do they think we are state parks?
- ATV use policy needs to be consistent agency wide.
- USFS trying to close all areas to ATV use unless designated open – WDFW should do the same.

- 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.

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

- Include language for long range plans, not only specific projects, i.e., whenever culverts wash out, not specific locations.
- Aspen stands need regeneration/restoration by logging, fire and other disturbances.
- Timber management – fuels management and prescribed (Rx) burning Income can help program.
- Grazing – restore economically and environmentally sustainable grazing using grazing plans, fencing, water, supplements, etc.
- Concern for keeping disturbance out of parcels permanently, i.e., fencing out riparian area and not grazing or burning it.
- Grazing management techniques, i.e., fall trees over streams to make access to riparian areas difficult vs. fencing out riparian areas.
- Specify what habitat objectives are in plan.
- Water rights – keep them up-to-date so don't lose them.
- Consider all species of grouse in management plans.
- Need augmentation of indigenous S-T grouse populations with birds from other areas.
- More signs – interpretive signs, e.g., wildlife to see, explaining management activities.
- Strategies 3.3 is important to remember
- Can justify grazing through good Coordinated Resource Management (CRM) – apply and influence good stewardship on other lands, e.g., federal and private lands.
- Include in the Wildlife Area goals a broadened approach to preserve, protect and manage for fish and wildlife species diversity (including habitat diversity) not just game species.
- Protect and preserve sensitive wildlife sites such as 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 as listed species preserve and protect the listed species.
- Actively manage for an increase in cottonwood gallery forest and associated habitat on Driscoll Island.
- Improve and manage wildlife viewing opportunities in a manner that is not detrimental to the wildlife resource.
- 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.
- Need to provide access to publicly held lands, especially in Okanogan County.
- Broaden wildlife area management to include multiple species management.

### **Issue C. Habitat**

- Plant food plots to pull deer off of private ground and feed for sharp-tailed grouse.
- Need more restoration planting of native grasses for S-T grouse.
- Noxious weeds is the concern that comes to mind right off... as if that is news to you.
- Reintroduction of fire to Driscoll island was a good idea. I recommend that be used in other locations as well. It appears to stimulate growth for a wider variety of plants, which in turn benefits wildlife. It adds to the diversity of the ecosystem.
- Are the "goose tubs" being used by wildlife? If so they should be maintained or enhanced. If not they should be picked up and discarded.
- I'm also in favor of planting blackberry as I've seen them utilized extensively by wildlife, especially in the winter. However such planting would be conditional upon the reintroduction of fire to control the blackberry plants. My dog prefers thornless blackberry please.
- Manage for native habitats and the processes that sustain them.

### **Issue D. Weeds**

- Weeds – there have been successes, but there are other weeds present and a sustained effort at eradication and control needs to be maintained.
- Keep weed management in plan when planning management activities that may create weed habitat, e.g., logging
- 

### **Issue E. Livestock Use**

- WDFW grazing leases create co-dependence for lessee and limit management flexibility.
- 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.

### **Issue F. Roads**

- Culverts – Plan needs to address road systems. Public roads vs. management roads. Weed management along roads. Maintenance of roads.

### **Issue G. Enforcement**

- Complete review of WDFW codes for lands.
- Law enforcement action can be taken regarding trespass livestock.
- Need to get regulations on the books to standardize camping limits to be the same as other public agencies.

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

- Wildlife Areas can be an educational opportunity to all levels of education.
- Informational signs and brochures for each wildlife area stating reason for purchase, funding source, funding resources, management funding, in lue of taxes, etc.
- Need a better photograph/picture on the "No ATV Allowed" signs.
- Law enforcement needs specific regulations to enforce social behavior on WDFW property – camping length of stay, removal of property, noise etc.
- Need informational boards at each end of wildlife areas stating what is allowed and not allowed to get away from signing each individual site. Marc Hallet has signs "Vehicular Travel Limited to County Roads".
- All wildlife areas should have maps like the Sinlahekin map.

**Issue I. Monitor, Survey and Inventory**

- Provide bird, mammal, butterfly, reptile and amphibian lists.

**Issue J. Other**

- DFW lands important for local economies. Concerned that DFW is using CAGS – credibility issue.
- CAG needs to be familiar with lands we are talking about.
- Citizen supported group is important.
- Water developments – regulations and policies regarding springs and intermittent streams.
- Employees on Eastern Okanogan County Wildlife Areas are appreciated.

## **APPENDIX 2. Driscoll Island Wildlife Area Weed Management Plan**

### **Weed Control Goals on WDFW Lands**

The goal of weed control on Department lands is to maintain and improve 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 weed densities that trigger control are sometimes different than on lands managed for other purposes (e.g. agricultural, etc.). For example, if a weed, with low invasiveness potential, 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 desired plant species and communities, rather than on simply eliminating weeds.

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

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:

- Minimizing soil disturbance.
- Restoring disturbed sites by planting desirable vegetation.
- Minimize risk of new weed infestations by encouraging/requiring “weed free” equipment, vehicles, people and domestic animals.
- Managing livestock use on the area.
- Managing public use.
- Coordinating weed prevention and control efforts with federal, state, county, local and private entities to improve efficacy and minimize costs.
- Establishing and requiring use of vehicle and equipment wash stations

Monitoring- Monitoring is necessary to locate new infestations, determine effectiveness of control efforts, implement prevention and to document the weed species, the distribution and the relative density on the wildlife area.

- Monitoring will include systematic gridding of the wildlife area, mapping weed infestation and documenting treatment effectiveness.

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.

- Several organizations have developed protocol for weed assessment and control prioritization including Nature Serve and The Nature Conservancy.

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.

- Singularly or in combination, treatment methods will be used to obtain maximum effect for control of the target weeds, while minimizing detrimental impacts to other vegetation if possible and maximizing weed control resources.

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

- Adaptive management will be the underlying principle for the DIWA weed management program.

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 Driscoll Island Wildlife Area:**

A vascular plant survey has not been completed for the Driscoll Island Wildlife Area. Therefore all exotic, species let alone, weed species that may be present have not been identified or detected. However, there are known to be at least 11 species of classified weed species by Washington State and/or Okanogan County Weed Board. These 11 species include 3 State Class B weeds, 5 State Class C weeds and 1 State Monitor specie. Additional exotic species exist on the DIWA that are not Classified as weed species by the State or County, however, based on observations of the current DIWA manager these species warrant eradication and/or control due to their demonstrated ability to spread.

State Class B Weeds present on the DIWA include: common houndstongue (*Cynoglossum officinale*), Dalmatian toadflax (*Linaria dalmatica ssp. dalmatica*), kochia (*Kochia scoparia*), Plumeless thistle (*Carduus acanthoides*), Purple Loosestrife (*Lythrum salicaria*), Russian knapweed (*Acroptilon repens*).

**State Class B – Designate (Bd) Weeds** present on the DIWA include: Dalmatian toadflax (*Linaria dalmatica ssp. dalmatica*), Plumeless thistle (*Carduus acanthoides*), and Purple Loosestrife (*Lythrum salicaria*)

**State Class C Weeds** present on the DIWA include: Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), Common tansy (*Tanacetum vulgare*) and reed canarygrass (*Phalaris arundinacea*).

**State Monitor List Weeds** present on the DIWA include: common mullein (*Verbascum thapsus*).

**County Class B – Designate (Bd)Weeds** present on the DIWA include: Dalmatian toadflax (*Linaria dalmatica ssp. dalmatica*) and Scotch thistle (*Onopordum acanthium*).

**County Class B & C - Reduction (B&Cr)Weeds** present on the DIWA include: common houndstongue (*Cynoglossum officinale*), diffuse knapweed (*Centaurea diffusa*), and Russian knapweed (*Acroptilon repens*).

**County Class B & C – Suppression (B&Cs) Weeds** present on the DIWA include: diffuse knapweed (*Centaurea diffusa*), Canada thistle (*Cirsium arvense*), kochia (*Kochia scoparia*), Russian thistle (*Salsola kali*), and common mullein (*Verbascum thapsus*).

**DIWA Manager designated vascular plant species for eradication** includes: Russian olive (*Elaeagnus angustifolia*) and common burdock (*Arctium minus*).

Table 1. Driscoll Island Wildlife Area State Class B & C & Monitor weeds including Okanogan County class B & C weeds with abundance and approximate number of acres treated.

Weed Species Common Name	Weed Species Latin Name	2006 State Weed Class	2006 County Weed Class	Abundance As of 2005	2005 Treated Acres
Dalmatian Toadflax	<i>Linaria dalmatica ssp dalmatica</i>	Bd	Bd		
Diffuse knapweed	<i>Centaurea diffusa</i>	B	B&Cr/B&Cs		
Kochia	<i>Kochia scoparia</i>	B	B&Cs		
Purple Loosestrife	<i>Lythrum salicaria</i>	Bd	B&Cs		
Russian knapweed	<i>Acroptilon repens</i>	B	B&Cr		
Common Tansy	<i>Tanacetum vulgare</i>	C			
Bull thistle	<i>Cirsium vulgare</i>	C			
Canada thistle	<i>Cirsium arvense</i>	C	B&Cs		
Reed canarygrass	<i>Phalaris arundinacea</i>	C			
Common mullein	<i>Verbascum thapsus</i>	M	B&Cs		
Russian thistle	<i>Salsola kali</i>		B&Cs		

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

**B&Cr** – Reduction Weeds are too widespread to be immediately controlled or eradicated countywide. Landowners are encouraged to concentrate initial reduction efforts in high priority areas such as roadways, driveways and property boundaries.

**B&Cs** – Suppression Weeds are so widely disseminated that prevention of seed production within a single season is not practical. Landowners are encouraged to control them.

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)<sup>1</sup>. 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 bumblebees 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).

#### **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.

#### **Herbicides**

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. Telar or Escort also provides good control of DT. The best time to treat (with any herbicide) would be prior to seed dispersal as seedlings and first year growth or into fall as the plants are going dormant for the year (Okanogan County Noxious Weed Office 2006).

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.

### **Biological agents**

A bioagent, *Mecinus janthinus*, a stem-boring weevil, has been shown to be effective in controlling Dalmatian toadflax. *Calophasia lunula*, a defoliating moth, is well established in Washington and reportedly provides good control (William et al. 1996) and *M. janthinus*, a recently introduced stem-boring weevil, shows promise. *M. janthinus* is present on the DIWA. *M. janthinus* releases have been made on Dalmatian Toadflax infestations in the area. *Brachypterolus pulicarius*, although usually associated with yellow toadflax, can survive and may reduce seed production of Dalmatian toadflax.

### **Cultivation**

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

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

There are several known sites where DT occurs ranging from small patches of several plants to areas encompassing 50+ acres.

**ACRES AFFECTED BY WEED:** consolidated on Driscoll Island Wildlife Area it would be ~ acres.

**WEED DENSITY:** Low to high

### **GOALS**

- Contain, control and eliminate present infestations
- Prevent new occurrences

### **OBJECTIVES**

- Continue to actively search for new infestations by gridding with WCC, volunteers and employees
- GPS new infestations and add to the GIS weed layer for mapping
- Revisit infestations twice per year for a minimum of 10 years until site is declared weed free, i.e., it has been at least 10 years since Dalmatian toadflax seed was produced at the site and or live Dalmatian toadflax plants have been observed at the site.
- Treat infestations according to protocol, i.e., cut, bag and mature plants that have formed seed if present, spray remaining plants.
- More accurately calculate and delineate, on maps, the acres affected by Dalmatian toadflax.
- Release biological control agents on infestations that are wide spread and relatively inaccessible

- Establish regulations and procedures for assuring off road equipment is washed clean of soil and plant material before entering the DIWA.
- Develop posters to place on reader boards to educate the public about Dalmatian toadflax identification and control.
- Develop brochures to hand out to the public regarding Dalmatian toadflax identification and control.
- Develop informational material to include on the DIWA website regarding Dalmatian toadflax identification and control

### **ACTIONS PLANNED**

In 2006 systematic gridding for Dalmatian Toadflax will begin with data gathered regarding density and presence of biological agents. GPS and map all infestations. Begin containment actions by chemically treating outlying infestations with all mature seed heads collected, bagged and burned. All known Dalmatian toadflax infestations will be visited twice during the growing season with appropriate action being taken based on findings, e.g., hand pulling, cutting and bagging and/or spraying. The biological agent, *M. janthinus*, will be released in areas where the infestation size makes it impractical to treat with herbicides.

### **CONTROL SUMMARY AND TREND**

2000-

2001-

2002-

2003-

2004- Bioagent, *M. janthinus*, releases were made.

2005-

Trend analysis of Dalmatian Toadflax on the Driscoll Island Wildlife Area indicates that it has been and is increasing in density and distribution. The first efforts to control DT on the Driscoll Island Wildlife Area occurred in 200 with the location and hand pulling of DT additionally X releases of the bioagent *Mecinus janthinus* have been made. In 2005 a limited amount of spraying was done.

## **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.

### **Cultivation**

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.

### **Herbicides**

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 Agents**

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. However, neither species shows much promise of reducing populations of Russian knapweed.

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 throughout the DIWA.

**ACRES AFFECTED BY WEED:** To be determined      **WEED DENSITY:** Low to high

### **GOALS**

- Contain, control and eliminate present infestations
- Prevent new occurrences

### **OBJECTIVES**

- Continue to actively search for new infestations by gridding with WCC, volunteers and employees
- GPS new infestations and add to the GIS weed layer for mapping
- Revisit infestations twice per year for a minimum of 10 years until site is declared weed free, i.e., it has been at least 10 years since Russian knapweed seed was produced at the site and or live Russian knapweed plants have been observed at the site.
- Treat infestations according to protocol, i.e., spray plants.
- More accurately calculate and delineate, on maps, the acres affected by Russian knapweed.
- Establish regulations and procedures for assuring off road equipment is washed clean of soil and plant material before entering the DIWA.
- Develop posters to place on reader boards to educate the public about Russian knapweed identification and control.
- Develop brochures to hand out to the public regarding Russian knapweed identification and control.
- Develop informational material to include on the DIWA website regarding Russian knapweed identification and control.

### **ACTIONS PLANNED**

In 2006 known Russian knapweed infestations will be sprayed in the spring and again in the fall after the first frost, per finding the most effective means of control. Continue gridding for Russian knapweed infestations. Continue systematic gridding for Russian knapweed on the DIWA. GPS and map newly located infestations.

Russian knapweed is relatively easy to control using herbicides but the timing is critical. Spraying in early spring has the second greatest degree of effectiveness. Spraying in the fall after the first frost has the highest degree of effectiveness. In both cases follow-up is crucial to success eradication of Russian knapweed infestations.

### **CONTROL SUMMARY AND TREND**

2000- Unknown  
2001- Unknown  
2002- Unknown  
2003- 0

2004- 0  
2005-



## DIFFUSE KNAPWEED CONTROL PLAN

**Scientific name:** *Centaurea diffusa*  
**Updated:** 2005

**Common name:** Diffuse knapweed

**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).

### **Herbicides**

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.

### **Biological Agents**

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-infestation. WDFW has had some success releasing *Larinus minutus*. *Larinus minutus*, a seed-eating weevil native to Greece, and now is established in 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. *L. minutus* has been released on the DIWA, but it is too early to determine effectiveness. Other diffuse knapweed biological agents present on the DIWA include: bronze knapweed root-borer (*sphenoptera jugoslovica*) and banded gall fly (*Urophora affinis*) and UV knapweed seed head fly (*U. quadrifasciata*).

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

Found in varying degrees of density throughout the DIWA

**ACRES AFFECTED BY WEED:** To be determined      **WEED DENSITY:** Low to high

### **GOALS**

- Contain, control, suppress and/or reduce present infestations
- Prevent new occurrences

### **OBJECTIVES**

- Continue to actively search for new infestations by gridding with WCC, volunteers and employees
- GPS new infestations and add to the GIS weed layer for mapping
- Revisit infestations twice per year for a minimum of 10 years until site is declared weed free, i.e., it has been at least 10 years since diffuse knapweed seed was produced at the site and or live Diffuse knapweed plants have been observed at the site.
- Treat infestations according to protocol, i.e., release/redistribute biological agents, or spray.
- Continue to treat roadsides, field perimeters, campgrounds, parking and other high use areas with herbicides
- More accurately calculate and delineate, on maps, the acres affected by diffuse knapweed.

- Continue to monitor biological control agents' presence and effectiveness
- Collect/purchase and redistribute/release biological control agents on infestations that are wide spread and relatively inaccessible
- Establish regulations and procedures for assuring off road equipment is washed clean of soil and plant material before entering the DIWA.
- Develop posters to place on reader boards to educate the public about diffuse knapweed identification and control.
- Develop brochures to hand out to the public regarding diffuse knapweed identification and control.
- Develop informational material to include on the DIWA website regarding Diffuse knapweed identification and control

### **ACTIONS PLANNED**

In 2006 all known diffuse knapweed infestations will be visited twice during the growing season with appropriate action being taken based on findings, e.g., release of bioagents, collection of bioagents or spraying.

The biological agent, *L. minutus*, will be released in areas where the infestation size or location makes it impractical to treat with herbicides.

Note and map infestations observed during systematic gridding for weeds on the DIWA.

GPS and map newly located infestations.

Continue to monitor diffuse knapweed infestations and bioagents present and their effects

Purchase and/or collect bioagents and release/redistribution.

Develop and post information at entrances, parking, camping, hiking, hunting and fishing areas advising visitors of diffuse knapweed and control.

### **CONTROL SUMMARY AND TREND**

1999- Unknown

2000- Unknown

2001- Unknown

2002- Unknown

2003-

2004- *L. minutus* were released

2005- *L. minutus* were released

## 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 have 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 in highly disturbed areas, e.g., agricultural fields/foodplots, roadsides that were treated with chemical sterilant, high use areas where vegetation has difficulty growing.

**ACRES AFFECTED BY WEED:** to be determined

**WEED DENSITY:** to be determined

### **GOALS**

- Contain, control, suppress and/or reduce present infestations
- Prevent new occurrences

## **OBJECTIVES**

- Continue to actively search for new infestations by gridding with WCC, volunteers and employees
- GPS new infestations and add to the GIS weed layer for mapping
- Revisit infestations twice per year for a minimum of 10 years until site is declared weed free, i.e., it has been at least 10 years since diffuse kochia was produced at the site and or live kochia plants have been observed at the site.
- Treat infestations according to protocol, i.e., spray.
- Continue to treat roadsides, field perimeters, campgrounds, parking and other high use areas with herbicides
- More accurately calculate and delineate, on maps, the acres affected by kochia.
- Establish regulations and procedures for assuring off road equipment is washed clean of soil and plant material before entering the DIWA.
- Develop posters to place on reader boards to educate the public about kochia identification and control.
- Develop brochures to hand out to the public regarding kochia identification and control.
- Develop informational material to include on the DIWA website regarding kochia identification and control

## **ACTIONS PLANNED**

In 2006 an effort to locate, document, map and begin containment and control of kochia will begin.

Develop and post information at entrances, parking, camping, hiking, hunting and fishing areas advising visitors of kochia and control.

## **CONTROL SUMMARY AND TREND**

Kochia has not been a priority target weed on DIWA thus it was controlled inadvertently during efforts to control other weeds that it may have been growing with.

## 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 clonal growth; and 3) small dioecious (male and female flowers on separate plants) flowerheads. 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, overwintering 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 midwest 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 aboveground 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).

It is not known if there any biological control agents that attack Canada thistle present on DIWA.

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

Canada thistle is widely scattered throughout DIWA with infestation of greatest density in moister sites, e.g., riparian areas along streams, bodies of water and springs.

**ACRES AFFECTED BY WEED:** To be determined      **WEED DENSITY:** Low to high

### **GOALS**

- Contain, control, suppress and/or reduce present infestations
- Prevent new occurrences

### **OBJECTIVES**

- Continue to actively search for infestations by gridding with WCC, volunteers and employees
- GPS infestations and add to the GIS weed layer for mapping

- Revisit infestations twice per year for a minimum of 10 years until site is declared weed free, i.e., it has been at least 10 years since Canada thistle seed was produced at the site and or live Canada thistle plants have been observed at the site.
- Treat infestations according to protocol, i.e., purchase/collect biological control agents and release/redistribute, spray.
- Continue to treat roadsides, field perimeters, campgrounds, parking and other high use areas with herbicides
- More accurately calculate and delineate, on maps, the acres affected by Canada thistle.
- Establish regulations and procedures for assuring off road equipment is washed clean of soil and plant material before entering the DIWA.
- Develop posters to place on reader boards to educate the public about Canada thistle identification and control.
- Develop brochures to hand out to the public regarding Canada thistle identification and control.
- Develop informational material to include on the DIWA website regarding Canada thistle identification and control

### **ACTIONS PLANNED**

In 2006 an effort to locate, document, map and begin systematic containment of Canada thistle will begin.

Determine presence, abundance and effectiveness of biological control agents.

Document presence and map locations of biological control agents.

Develop and post information at entrances, parking, camping, hiking, hunting and fishing areas advising visitors of Canada thistle and control.

Use mechanical, biological and chemical methods to begin containment of Canada thistle infestations.

### **CONTROL SUMMARY AND TREND**

Canada thistle has not been a priority target weed on the DIWA. Control activities have been incidental to other weed control activities where Canada thistle was with other weeds or near other weeds subject to chemical or mechanical control.

## 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, structures agricultural fields/foodplots and include species like shepherd's purse, cheatgrass, lambsquarters, pigweed, quakgrass, wild tarragon, common burdock, Jim Hill mustard, etc.

### 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

DIWA has general weeds scattered throughout with heaviest infestations in areas subject to frequent prolonged disturbance that creates bare soil.

**ACRES AFFECTED BY WEED:** ~400    **WEED DENSITY:** Low to moderate depending on site and weed.

### GOALS

- Contain, control, suppress and/or reduce present infestations
- Prevent new occurrences
- Restore desirable vegetation to site as soon as possible.

### OBJECTIVES

- GPS sites with high probability of becoming or are infested with general weeds and add to the GIS weed layer for mapping
- Treat infestations according to protocol, i.e., mow, disc, release biological agents, hand pull and bag, spray.
- More accurately calculate and delineate, on maps, the acres affected by or potentially infested by general weeds.
- Establish regulations and procedures for assuring off road equipment is washed clean of soil and plant material before entering the DIWA.
- Develop posters to place on reader boards to educate the public about general weed identification and control.
- Develop brochures to hand out to the public regarding general weed identification and control.
- Develop informational material to include on the DIWA website regarding general identification and control

## **ACTIONS PLANNED**

Through 2006 continue summer fallow agricultural fields and foodplots until they have been planted. Continue roadside spraying and areas of high public use.

## **CONTROL SUMMARY AND TREND**

General weeds have been treated as part of the foodplot preparation and maintenance program, by spraying, summer fallowing and replanting. Also general weed control is accomplished in conjunction with chemical weed control of other “target species”.

In some cases exotic grasses constitute “weed species” where they have been planted in former foodplots and agricultural fields. In these instances the “weeds” infesting the former foodplots and agricultural fields need to be worked up and replanted to a mix of native vegetation that will contribute to the indigenous diversity of the site.

Other weed species that control plan sheets will be developed for in the future include:

Bull thistle (*Cirsium vulgare*)

Baby’s breath (*Gypsophila paniculata*)

Reed canarygrass (*Phalaris arundinacea*).

Scotch thistle (*Onopordum acanthium*)

Common mullein (*Verbascum thapsus*).

Russian thistle (*Salsola kali*)

In addition to the foregoing, the following actions will be pursued over the long term. In some cases, actions in this list may be redundant to previous actions listed.

## **WEED MANAGEMENT ACTIONS**

### **Prevention: Preventive actions to be used on the DIWA include:**

- 1) Perform regular inventories, gridding with groups of volunteers, e.g., Backcountry Horsemen or paid employees, e.g., WCC crews, of the DIWA looking for new weed species or new infestations of weeds already present, documenting findings and areas searched in GIS database and on maps.
- 2) Reseed bare ground to establish desirable vegetation and reduce ability of weeds to become established.
- 3) Use farming methods that reduce weed establishment.
- 4) Use livestock management techniques, e.g., graze heavy cheatgrass infestations early to reduce competition with later vegetation growth, to reduce weed establishment.
- 5) Maintain current records and maps of newfound areas of established HT, DT, DK and RK infestations.
- 6) DIWA personnel will learn to identify all weed species in all phenological stages and weed species with potential of infesting the DIWA.
- 7) Additional weed prevention actions will include:

**Wildlife Feeding** – all wildlife feeding on DIWA shall be done with certified “weed free” hay and grain.

### **Grazing Permits (NO GRAZING PERMITS HAVE BEEN ISSUED FOR DRISCOLL ISLAND SINCE 2001 AND DUE TO ACCESSIBILITY ISSUES NO GRAZING PERMITS ARE ANTICIPATED IN THE FUTURE)**

– all livestock entering, crossing or using the Driscoll Island Wildlife Area will be fed weed free forage for 3 days prior to entry on the DIWA. Additionally all livestock will be free of weed seeds in their hooves and hair. All persons and livestock, e.g., horses and dogs, and equipment including, but not limited to, cars, jeeps, ORV’s, SUV’s, trailers, pickups, trucks, semi-trucks, trailers, stock trailers, 4-wheelers, etc., used in moving livestock onto or across the DIWA will be free of weed seeds. All equipment will be power washed and free of plant materials and soil before entering the DIWA; all livestock will be inspected before entering the DIWA. All grazing permittees shall demonstrate the ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**Agricultural Leases** – all persons and equipment and accessories including, but not limited to, cars, 4-wheelers, pickups, trucks, semi-trucks, tractors, balers, swathers, mowers associated with agricultural leases will be weed free. All equipment will be washed and free of plant materials and soil before entering the DIWA. All agricultural lessees shall demonstrate the ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**Logging operations, fuels thinning and wood cutting contracts**– all persons and equipment and accessories including, but not limited to, cars, 4-wheelers, pickups, trucks, semi-trucks, tractors, skidders, caterpillar tractors, feller bunchers, feller processors, forwarders and loaders associated with fuels thinning and wood cutting contracts will be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. All fuels thinning and wood cutting contractors shall demonstrate the ability to identify weed species in all stages of growth and

their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**Road Maintenance and Construction** – all persons and road maintenance and construction equipment including, but not limited to, caterpillar tractors, graders, groomers, pickups, cars, dump trucks, semi-trucks, belly dumps shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. All road maintenance and construction personnel and/or their supervisor shall demonstrate the ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**Fence Maintenance and construction** – all persons and fence maintenance and construction equipment including, but not limited to, caterpillar tractors, pickups, cars, and 4-wheelers, ORVs, 4-wheel drives, backhoes shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. All fence maintenance and construction personnel and/or their supervisor shall demonstrate the ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**Culvert Maintenance and Installation** – all persons and culvert maintenance and installation equipment including, but not limited to, backhoes, caterpillar tractors, pickups, cars, and 4-wheelers, ORVs, 4-wheel drives shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. All fence maintenance and construction personnel and/or their supervisor shall demonstrate the ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**Infrastructure Maintenance and Construction** – all persons and infrastructure maintenance and construction equipment including, but not limited to, backhoes, caterpillar tractors, pickups, cars, and 4-wheelers, ORVs, 4-wheel drives shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. All building maintenance and construction personnel and/or their supervisor shall demonstrate the ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**Dump and Garbage Cleanup** – all persons and dump and garbage cleanup equipment including, but not limited to, backhoes, caterpillar tractors, pickups, cars, and 4-wheelers, ORVs, 4-wheel drives, trailers, shovels, rakes, hoes shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. All dump and garbage cleanup personnel or their supervisor shall demonstrate the ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**Weed Control Operations: Spraying, Mowing and Handpulling** – all persons and weed control operations equipment including, but not limited to, sprayers, mowers, pickups, cars, 4-wheelers, ORVs, 4-wheel drives, trailers, shovels, rakes, hoes shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA or being moved to a

new area on the DIWA. All weed control operations personnel and their supervisor shall demonstrate the ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**Fire Management: Prescribed burn operations, Wildfire Control** – all persons and fire management equipment including, but not limited to, caterpillar tractors, pickups, cars, and 4-wheelers, ORVs, 4-wheel drives, pumpers, tenders, engines, helicopters, trailers, shovels, rakes, hoes, pulaskis shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. All dump and garbage cleanup personnel or their supervisor shall demonstrate the ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**All Offroad Travel** – Unauthorized off road travel is strictly prohibited on the DIWA. All persons participating in and equipment used in travel off road or capable of traveling off road including, but not limited to, caterpillar tractors, pickups, cars, and 4-wheelers, ORVs, 4-wheel drives shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. All offroad travel personnel shall demonstrate the ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**Neighbors** – all personnel officially affiliated with the DIWA and associated equipment will be weed free before leaving the DIWA and/or entering neighbors' property.

**DIWA Equipment and Personnel** – All DIWA equipment entering the DIWA including, but not limited, to pickups, 4-wheelers, ORVs, 4-wheel drives shall be weed free. All DIWA equipment will be power washed and free of plant materials and soil before entering the DIWA. All DIWA personnel and their supervisor shall demonstrate the ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities.

**Hunters** - all persons participating in and equipment used for hunting including, but not limited to, dogs, horses, pickups, cars, 4-wheel drives and horse trailers shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. Weed identification information will be provided to and/or posted for hunters in order to increase their ability to identify weed species in all stages of growth and their seeds as well as increasing their understanding of weed dispersal mechanics and weed enhancing activities.

**Dog owners**- all persons participating in activities, hiking, hunting, fishing, walking, etc., on the DIWA with a dog shall make sure that their dog(s) are weed free before letting the dog loose on DIWA. Additionally they shall make sure that their dog is weed free before moving to a new site on the DIWA or leaving the DIWA.

**Fisherpersons** - all persons participating in and equipment used for fishing including boats, horses, pickups, cars, 4-wheel drives shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. Weed identification information will be provided to and/or posted for fisherpersons in order to increase their ability to identify weed species

in all stages of growth and their seeds as well as increasing their understanding of weed dispersal mechanics and weed enhancing activities.

**Birdwatchers** - all persons participating in and equipment used in birdwatching including, but not limited to pickups, cars, 4-wheel drives shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. Weed identification information will be provided to and/or posted for birdwatchers in order to increase their ability to identify weed species in all stages of growth and their seeds as well as increasing their understanding of weed dispersal mechanics and weed enhancing activities.

**Hikers** - all persons participating in and equipment used for hiking including, but not limited to, dogs, horses, pickups, cars, 4-wheel drives shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. Weed identification information will be provided to and/or posted for hikers in order to increase their ability to identify weed species in all stages of growth and their seeds as well as increasing their understanding of weed dispersal mechanics and weed enhancing activities.

**Horseback Riders** – all horses, persons participating in and equipment used in horseback riding including, but not limited to, pickups, cars, 4-wheel drives and horse trailers shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. Weed identification information will be provided to and/or posted for horseback riders in order to increase their ability to identify weed species in all stages of growth and their seeds. Further they shall demonstrate an understanding of weed dispersal mechanics and weed enhancing activities. All feed brought to the SWA for feeding riding stock, e.g., hay, grain, etc., shall be certified, “Weed free”.

**Campers** - all persons participating in and equipment used for butterfly and wildflower observation, but not limited to, dogs, horses, pickups, cars, 4-wheel drives shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. Weed identification information will be provided to and/or posted for hikers in order to increase their ability to identify weed species in all stages of growth and their seeds as well as increasing their understanding of weed dispersal mechanics and weed enhancing activities.

WDFW publications including, but not limited to, hunting and fishing pamphlets, wildlife area maps, informational brochures, carry information about weeds, weed identification, weed dispersal mechanics and weed enhancing activities.

**Butterfly and Wildflower observers** - all persons participating in and equipment used for butterfly and wildflower observation, but not limited to, dogs, horses, pickups, cars, 4-wheel drives shall be weed free. All equipment will be power washed and free of plant materials and soil before entering the DIWA. Weed identification information will be provided to and/or posted for hikers in order to increase their ability to identify weed species in all stages of growth and their seeds as well as increasing their understanding of weed dispersal mechanics and weed enhancing activities.

In addition to all of the foregoing all persons will be encouraged to report observations of weeds and provided information to facilitate reporting weeds and weed infestations.



**Clothing** - Lace up boots, wool shirts and pants, cotton shirts and pants, and fleece clothing readily collect weed seed and can contribute to dispersal of weed seeds.

**HELP PREVENT THE SPREAD OF WEED SEEDS**

Carry a small strong plastic bag with you when visiting DIWA and place all weed seeds you find attached to yourself, associates, dogs or horses in the bag, take it home and burn the seeds or burn them in a campfire during the season campfires are allowed and where campfires are allowed.

## APPENDIX 3. Fire Management

### Part 1 Wildfire Control and Suppression

Responsible Fire-Suppression Entities: **Depending upon where a fire occurs, the appropriate entity must be contacted first, followed by an immediate call to other jurisdictions adjacent to the fire. In some cases, where there are multiple landowners or fire responders, fire suppression activities may involve two or more fire fighting entities.** The Driscoll Island Wildlife Area (DIWA) falls entirely within the jurisdiction of the Okanogan County Rural Fire District (RFD) #1 (Oroville).

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

Wildlife Habitat Concerns: Although the historic fire regime of DIWA was likely infrequent mix severity fires, the habitat is nevertheless fire dependent and periodic fire is needed to maintain healthy habitat. However a wildfire will, in all probability, result in too much fire or extreme fire behavior due to extreme fuel conditions. Therefore initial attack on all wildfires on the DIWA should be aggressive. As more prescribed fire is applied to DIWA lands, fire severity potential will decrease substantially resulting in easier wildfire suppression and management.

Other Concerns: The greatest part of DIWA is an island, surrounded by river channels. Should a wild fire occur on the DIWA, there is little chance that the fire would cross the river channels without moderate to strong winds to carry sparks and embers across the river channels. However, a major concern is soil disturbance caused by heavy equipment used in fire suppression activities that result in increased noxious weed proliferation. Another concern is that fire fighting equipment, e.g., dozers, engines, semi-trucks, trailers, etc., brought to the area is not weed free. Thus new weeds can become established and result in many years and thousands of dollars spent on weed control. Of primary concern during a wildfire on the DIWA are structures, e.g., buildings, bird feeders, power poles, etc.

Additionally the preferred strategy for ground based fire suppression on the DIWA is to use existing roads and trails for holding and burnouts to minimize dozer trail construction. With the foregoing concerns in mind WDFW requests that the Incident Commander (IC) or other fire fighting personnel on site notify WDFW personnel immediately in the order listed above. A WDFW Advisor will provide information to the IC regarding plant community and vegetation concerns, maps of access roads and trails to the fire site. GIS maps of all existing, orphaned and abandoned roads and trails will be provided, if necessary, to a scale of ¼ Section per 8" or 1" = 330'.

Aerial Support: The WDFW recommends that fire-fighting entities suppress fires on the wildlife area as rapidly as possible. WDFW requests the IC to seek aerial support if needed to extinguish a fire on its land promptly. If, in the professional judgment of the IC, a fire on lands adjacent to the Driscoll Island Wildlife Area causes an immediate threat to the area, WDFW requests that the IC seek aerial support as soon possible.

**Reporting:** Report any wildfire on or adjacent to the DIWA by contacting the Okanogan County Sheriff's Office, local RFD and/or the DNR Dispatch Office in Colville (See contacts below). It is absolutely critical that any wildfire on the area is attacked as aggressively as possible during the initial attack given the expressed concerns stated previously. The importance of aerial support cannot be overstated.

**Rural Fire Districts – DIAL 911**

NAME	TELEPHONE	CELL
Okanogan Co. District #1, Oroville (Rod Noel, Chief)	509.476.2106	509.

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

NAME	TELEPHONE
DNR – For Fires Only	1.800.562.6010
DNR Dispatch (Colville)	509.684.7474
DNR Highlands District office	509.223.3110 (fire line)

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

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

NAME	TELEPHONE	PRIVATE TELEPHONE	CELL
Dale Swedberg, DIWA Manager	509.223.3358	509.223.3059	
Don Garrett, DIWA Assistant Manager	509.826.4626	509.826.4527	509.322.3966
Jim Olson, Scotch Creek Wildlife Area Manager	509.826.4430	509.846.8108	509.429.0796
Troy McCormick, Fish & Wildlife Officer	509.422.7206 (Ok. Co Sheriff (Dispatch))		
John Danielson, Fish & Wildlife Officer, Omak	509.422.7206 (Ok. Co Sheriff (Dispatch))		
Jim Brown – Sergeant, Omak Office	509.826.7371		
Regional Office - Ephrata	509.754.4624		
Regional Program Manager – Matt Monda	509.754.4624 (16)		

**Part II Prescribed (Rx) Fire**

Prescribed (Rx) fire is defined as any fire that is set or allowed to burn with predetermined goals, e.g., fuels reduction, reinitiate vegetation succession, initiate fire effects, enhance nutrient cycle, enhance water cycle, increase fire dependent vegetation habitat component, decrease fire sensitive habitat component. However, when a prescribed fire exceeds certain parameters, e.g., escapes predetermined boundaries, and it will be declared a wildfire and suppression action will be taken.

## **Background**

Fire has evolved with life forms through millennia, life forms provide the fuels that allow fire to exist. Thus fire regimes have developed, generally categorized as frequent low severity, mixed severity and infrequent high severity, as a result of topographic characteristics, weather patterns and fuels. Based on the long-term relationship with fire many life forms and ecosystems have become fire adapted if not out-right fire dependent to complete their life cycle and/or to maintain environmental conditions needed for survival. Fire's most obvious and primary influence is upon the vegetation component of wildlife habitat. Vegetation dynamics, composition and structure in the historic frequent fire regime zones, specifically dry site forest types and shrub-steppe, has changed dramatically under current and historic fire policies, i.e., total fire suppression for the past 80 years. The upshot being degraded habitat for the wildlife dependent on those vegetation types and plant associations.

## **Policy**

WDFW recognizes the integral part historic fire has had in creation and maintenance of fish and wildlife habitat. Further WDFW recognizes the benefits to wildlife through application of fire and encourages prescribed burning to benefit fish and wildlife on WDFW owned and managed lands as well as other lands under state, federal and private ownership.

## **Procedure**

Prescribed (Rx) burning shall be conducted in accordance with WDFW policies and procedures (in preparation) and all Federal and State laws, rules and regulations. All required permits or waivers shall be obtained prior to implementation of any Rx burn.

A Rx burn plan will be written and approved by the Wildlife Area Manager, District Team, Washington Department of Natural Resources and any other entity that will be directly involved in implementing the Rx burn. All Rx burn plans will have, at minimum, the following elements – see outline or example (in preparation)

All personnel and equipment participating in implementing a Rx burn shall have all necessary credentials and certifications required to participate in the implementation in their respective capacities. Prior to implementation of any Rx burn all credentials and certificates will be inspected and verified that the holder is qualified for the duties and responsibilities assigned to them during implementation.

WDFW can enter into agreements with other State, Federal or private entities to conduct Rx burning on WDFW lands independently or as part of a larger Rx burn that includes multiple ownerships.

To conduct a Rx burn all the following steps will need to be completed:

- 1) Pre-burn preparation
  - Selection of area(s) for Rx burn
  - Prescriptions and Justification for Rx burn
  - Development and writing Rx burn plan
  - Develop contracts and agreements
  - Obtain permits and/waivers

- Secure/hire qualified personnel to implement burn
- Verification of credentials and certificates
- Secure qualified equipment and operators to implement burn
- Verification of credentials and certificates of equipment and operators
- Assure that all equipment will be free of soil and plant material
- Fire/control line location and marking
- Identify fire sensitive resources, e.g., certain species of trees or shrubs, snags, legacy trees and mark them for protective action such as pulling burnable debris (duff and branches) back from the base of trees or snags, putting in fire line around shrubs or trees, e.g., Rocky Mountain Juniper, subAlpine fire, Engleman spruce.
- Make sure all fire sensitive resources have been properly addressed.
- Advise Burn Boss, Ignition Specialist and Holding Specialist of sensitive resources so they can use ignition techniques to reduce risk of losing sensitive resources.
- Fire/control line creation
- Get daily weather readings, e.g., Relative Humidity (RH), wind direction, speed and gusts, etc. for a week prior to planned ignition
- Get fuel moisture readings (10 hr and 100 hr) in open and under canopy
- Blackline
- Determine burn date and unit(s) to burn
- Get fire weather forecast
- Request smoke management
- Document progress and observations

## 2) Burn implementation

- All required personnel and equipment onsite
  - There will be portable radios for no less than half of the personnel participating in implementation
- All equipment inspected for condition and proper operation
  - Verification of credentials and certificates of equipment and operators
  - Verify all equipment it is free of soil and plant material
- All hands meeting with Burn Boss. Complete review of burn plan, safety considerations and all details relevant to conducting a safe Rx burn
- Verify fuel moisture (10 hr and 100 hr) in open and under canopy
- Test burn
- Verify that **all parameters** are within prescription
- If **ALL parameters** are within prescription, then begin ignition
- Fire/control lines will be patrolled until there is NO chance that fire will escape the line and no spot fires have started
- Patrol all lines of previously burned units before beginning ignition of new units
- Document progress and observations

## 3) Post-burn

- Patrol fire/control line twice a day minimum (once before conditions, i.e., RH goes down, allow fire behavior to become active and once after conditions, i.e., RH goes up, suppress fire behavior) looking for escaped fire or spot fires.
- Control and extinguish all escaped or spot fires.

- Continue to patrol until all “smokes” are out that are within 30 feet of the fire/control line, keeping in mind that strong gusty winds could spread sparks from a “smoke”
- Be aware of fire burning underground following a root or underground fuels and permitting fire outside the fire/control line
- Be aware of a tree or snag that could burn and fall outside the fire/control line permitting fire outside the fire/control line
- Immediately, after the fire has died down, patrol area within burn perimeter to check on resources that were to be protected from burning, e.g., shrubs, plant communities, legacy trees, structures, and take necessary action if these resources are still at risk, e.g., fire got into base of legacy tree, fire crossed fire line around shrub, etc. During this time personnel must always be aware of the potential danger of trees that may fall, burned out stumps or roots holes that a person can step or fall into, etc.
- Document observations

## APPENDIX 4 Water Rights

Okanogan County WRIA: 49														
File #	Cert #	Stat	Doc	Priority Date	Purpose	Qi	UOM	Qa	Irrig Acres	TRS	QQ/Q	Src's	1stSource	Comments
G4- *03795CWRIS	2257	A	Cert	10/29/54	IR	200.00	GPM	80.00	20.00	39.0N 27.0E 03		1	Well	Supplemented by G4- *07846AKSC WRIS
G4- *07846AKSCWRIS	05783 A	A	Cert	11/1/65	IR	250.00	GPM	465.00	155.00	39.0N 27.0E 03		3	Well	Supplemental to G4- *03795CWRIS Well No 1
G4- *07846AKSCWRIS	05783 A	A	Cert	11/1/65	IR		GPM			39.0N 27.0E 03			Well	Supplemental to G4- *03795CWRIS Well No 2
G4- *07846AKSCWRIS	05783 A	A	Cert	1/1/65	IR		GPM			39.0N 27.0E 03			Well	Supplemental to G4- *03795CWRIS Well No 3
G4- 150539CL		A	Claim L	4/1/38	IR	300.00	GPM	220.00	55.00	39.0N 27.0E 04	NE/NE	1	Well	Duplicative to G4- *07846AKSC WRIS Well No 1
G4- 150540CL		A	Claim L	4/1/38	IR	150.00	GPM	220.00		39.0N 27.0E 03	NE/NE	1	Well	Duplicative to G4- *07846AKSC WRIS Well No 2
G4- 150541CL		A	Claim L	4/1/38	IR	800.00	GPM	460.00	115.00	39.0N 27.0E 03	SW/NE	1	Well	Duplicative to G4- *07846AKSC WRIS Well No 3
G4- 150543CL		A	Claim L	4/1/38	IR	13.00	GPM	2.00		39.0N 27.0E 34		1	Well	

### Abbreviations

**CI** - Commercial Industrial; **DS** - Single Domestic; **FR** - Fire Protection; **IR** - Irrigation; **Qa** – allowed Annual Quantity in acre feet per year; **Qi** – Allowed Instantaneous Quantity in GPM (ground water) or CFS (surface water); **SR** - Storage; **ST** - Stock; **WL** – Wildlife; **DG** - General Domestic - defined as “use of water for all domestic uses not specifically defined in the water right record or not defined by the other specific domestic use categories. Includes sewage treatment, farm supply and laboratory use.” **UOM** – Unit of measure: **GPM** – gallons per minute, **CFS** – cubic feet per second; **Stat** – status: **A**=Active, **I**=Inactive and therefore conveys no right to divert water; **TRS** - Township, Range, Section – location of point of diversion. See document for description of the point of use.

**Note:** Copies of original documents in file

## APPENDIX 5 Climatic Information

### TONASKET 4 NNE, WASHINGTON (458520)

#### Period of Record Monthly Climate Summary

Period of Record : 7/ 1/1984 to 9/30/2004

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	33.9	41.3	54.4	65.2	72.9	79.9	87.2	86.1	76.6	61.0	43.6	33.0	61.3
Average Min. Temperature (F)	22.7	24.9	30.8	37.5	43.8	49.8	54.4	53.3	45.0	35.5	28.6	22.9	37.4
Average Total Precipitation (in.)	1.01	0.89	0.70	0.84	1.41	1.38	0.71	0.60	0.50	0.74	1.20	1.44	11.43
Average Total SnowFall (in.)	4.8	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	6.0	13.9
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.

Max. Temp.: 99.4% Min. Temp.: 99.3% Precipitation: 96.8% Snowfall: 94% Snow Depth: 82.6%

Check [Station Metadata](#) or [Metadata graphics](#) for more detail about data completeness.

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Western Regional Climate Center, [wrcc@dri.edu](mailto:wrcc@dri.edu)



## APPENDIX 6 Species and Habitat Information

### Priority Species List:      Invertebrates:

MOLLUSCS						
For information on state listed or candidate species, see the <a href="#">SOC List</a> .						
COMMON NAME	Scientific name	SPECIES CRITERIA		WASHINGTON STATUS	Priority Area	Presence Confirmed on DIWA
<b>Gastropods (Gastropoda)</b>						
Giant Columbia River limpet	<i>Fisherola nuttalli</i>	1	2	State Listed or Candidate Species	Any occurrence	
Great Columbia River spire snail	<i>Fluminicola columbiana</i>	1	2	State Listed or Candidate Species	Any occurrence	
<b>Bivalves (Bivalva)</b>						
California floater	<i>Anodonta californiensis</i>	1	2	State Listed or Candidate Species	Any occurrence	
ARTHROPODS						
<b>Butterflies (Lepidoptera)</b>						
Silver-bordered fritillary	<i>Boloria selene atrocotalis</i>	1		State Listed or Candidate Species	Any occurrence	
Yuma skipper	<i>Ochlodes yuma</i>	1		State Listed or Candidate Species	Any occurrence	

### Priority Species List:      Vertebrates:

FISH						
For information on state listed or candidate species, see the <a href="#">SOC List</a> .						
COMMON NAME	Scientific name	SPECIES CRITERIA		WASHINGTON STATUS	Priority Area	Presence Confirmed on DIWA
<b>Minnnows (Cyprinidae)</b>						
Lake chub	<i>Couesius plumbeus</i>	1		State Listed or Candidate Species	Any occurrence	
Leopard dace	<i>Rhinichthys falcatus</i>	1		State Listed or Candidate Species	Any occurrence	
Umatilla dace	<i>Rhinichthys umatilla</i>	1		State Listed or Candidate Species	Any occurrence	
<b>Suckers (Catostomidae)</b>						

Mountain sucker	<i>Catostomus platyrhynchus</i>	1			State Listed or Candidate Species	Any occurrence	
<b>Trout, Salmon, &amp; Whitefishes (Salmonidae)</b>							
Westslope cutthroat	<i>Oncorhynchus clarki lewisi</i>			3	Game	Any occurrence	
Rainbow trout/Steelhead	<i>Oncorhynchus mykiss</i>	1		3	State Listed or Candidate Species; Game	Any occurrence	
Kokanee	<i>Oncorhynchus nerka</i>			3	Game	Any occurrence	
<b>Sunfishes (Centrarchidae)</b>							
Smallmouth bass	<i>Micropterus dolomieu</i>			3	Game	Any occurrence	Yes
Largemouth bass	<i>Micropterus salmoides</i>			3	Game	Any occurrence	Yes
<b>Perches (Percidae)</b>							
Walleye	<i>Stizostedion vitreum</i>			3	Game	Any occurrence	
<b><u>AMPHIBIANS</u></b>							
For information on state listed or candidate species, see the <a href="#">SOC List</a> .							
<b>Frogs (Anura)</b>							
Western toad	<i>Bufo boreas</i>	1			State Listed or Candidate Species	Any occurrence	
Columbia spotted frog	<i>Rana luteiventris</i>	1			State Listed or Candidate Species	Any occurrence	
Northern leopard frog	<i>Rana pipiens</i>	1			State Listed or Candidate Species	Any occurrence	
<b><u>REPTILES</u></b>							
For information on state listed or candidate species, see the <a href="#">SOC List</a> .							
Sagebrush lizard	<i>Sceloporus graciosus</i>	1			State Listed or Candidate Species	Any occurrence	
<b><u>BIRDS</u></b>							
For information on state listed or candidate species, see the <a href="#">SOC List</a> .							
<b>Marine Birds</b>							
Western grebe	<i>Aechmophorus occidentalis</i>	1	2		State Listed or Candidate Species	Breeding areas	
Common loon	<i>Gavia immer</i>	1	2		State Listed or Candidate Species	Breeding sites, regular and regular large concentrations	
American white pelican	<i>Pelecanus erythrorhynchos</i>	1	2		State Listed or Candidate Species	Breeding areas; regular and regular large concentrations	
<b>Herons (Ciconiiformes)</b>							

Great blue heron	<i>Ardea herodias</i>		2			Breeding areas	Yes
Black-crowned night heron	<i>Nycticorax nycticorax</i>		2			Breeding areas	
<b>Waterfowl (Anseriformes)</b>							
	<i>Waterfowl concentrations</i>		2	3	Game	Significant breeding areas and regular large concentrations in winter	
Wood duck	<i>Aix sponsa</i>			3	Game	Breeding areas	Yes
Common goldeneye	<i>Bucephala clangula</i>			3	Game	Breeding areas	
Barrow's goldeneye	<i>Bucephala islandica</i>			3	Game	Breeding areas	
Bufflehead	<i>Bucephala albeola</i>			3	Game	Breeding areas	
Trumpeter swan	<i>Cygnus buccinator</i>		2	3	Game	Regular and regular large concentrations	
Tundra swan	<i>Cygnus columbianus</i>		2	3	Game	Regular and regular large concentrations	
Harlequin duck	<i>Histrionicus histrionicus</i>		2	3	Game	Breeding areas, regular and regular large concentrations in saltwater	
Hooded merganser	<i>Lophodytes cucullatus</i>			3	Game	Breeding areas	
<b>Hawks, Falcons, Eagles (Falconiformes)</b>							
Northern goshawk	<i>Accipiter gentilis</i>	1			State Listed or Candidate Species	Breeding areas, including alternate nest sites, post-fledging foraging areas	
Golden eagle	<i>Aquila chrysaetos</i>	1			State Listed or Candidate Species	Breeding and foraging areas	
Merlin	<i>Falco columbarius</i>	1			State Listed or Candidate Species	Breeding sites	
Prairie falcon	<i>Falco mexicanus</i>			3		Breeding areas	
Peregrine falcon	<i>Falco peregrinus</i>	1			State Listed or Candidate Species	Breeding areas, regular occurrences, hack sites	
Bald eagle	<i>Haliaeetus leucocephalus</i>	1			State Listed or Candidate Species	Breeding areas, communal roosts, regular and regular large concentrations, regularly-used perch trees in breeding areas	Yes
<b>Upland Game Birds (Galliformes)</b>							

Chukar	<i>Alectoris chukar</i>			3	Game	Regular and regular large concentrations in WDFW's Primary Management Zones for chukar	
Blue grouse	<i>Dendragapus obscurus</i>			3	Game	Breeding areas, regular concentrations	
Wild turkey	<i>Meleagris gallopavo</i>			3	Game	Regular and regular large concentrations and roosts in WDFW's Primary Management Zones for wild turkeys	Yes
Ring-necked pheasant	<i>Phasianus colchicus</i>			3	Game	Self-sustaining birds observed in regular or regular large concentrations in WDFW's eastern Washington Primary Management Zone for pheasant	Yes
<b>Cranes (Gruiformes)</b>							
Sandhill crane	<i>Grus canadensis</i>	1			State Listed or Candidate Species	Breeding areas, regular large concentrations, migration staging areas	
<b>Shorebirds (Charadriiformes)</b>							
Eastern Washington breeding occurrences of: Phalaropes			2			Breeding areas	
<b>Pigeons (Columbiformes)</b>							
Band-tailed pigeon	<i>Columba fasciata</i>			3	Game	Breeding areas, regular concentrations, occupied mineral springs	
<b>Cuckoos (Cuculiformes)</b>							
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	1			State Listed or Candidate Species	Any occurrence	
<b>Owls (Strigiformes)</b>							
<b>Swifts (Apodiformes)</b>							
Vaux's swift	<i>Chaetura vauxi</i>	1			State Listed or Candidate Species	Breeding areas, communal roosts	Yes
<b>Woodpeckers (Piciformes)</b>							
Pileated woodpecker	<i>Dryocopus pileatus</i>	1			State Listed or Candidate Species	Breeding areas	Yes
Lewis' woodpecker	<i>Melanerpes lewis</i>	1			State Listed or Candidate Species	Breeding areas	Yes
<b>Perching Birds (Passeriformes)</b>							

Loggerhead shrike	<i>Lanius ludovicianus</i>	1			State Listed or Candidate Species	Regular occurrences in breeding areas, regular and regular large concentrations	
<b>MAMMALS</b>							
For information on state listed or candidate species, see the <a href="#">SOC List</a> .							
<b>Bats (Chiroptera)</b>							
Roosting concentrations of: Pallid bat	<i>Antrozous pallidus</i>		2			Regular large concentrations in naturally occurring breeding areas and other communal roosts	Yes
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	1	2		State Listed or Candidate Species	Any occurrence	Yes
Roosting concentrations of: Big brown bat	<i>Eptesicus fuscus</i>		2			Regular large concentrations in naturally occurring breeding areas and other communal roosts	Yes
Roosting concentrations of: Myotis bats	<i>Myotis spp.</i>		2			Regular large concentrations in naturally occurring breeding areas and other communal roosts	Yes
<b>Terrestrial Carnivores (Carnivora)</b>							
Mink	<i>Mustela vison</i>			3	Game	Regular occurrences	
<b>Big Game Ungulates (Artiodactyla)</b>							
Moose	<i>Alces alces</i>			3	Game	Regular concentrations	Yes
Rocky Mountain mule deer	<i>Odocoileus hemionus hemionus</i>			3	Game	Breeding areas, migration corridors, regular and regular large concentrations in winter	Yes
Northwest white-tailed deer	<i>Odocoileus virginianus ochrourus</i>			3	Game	Breeding areas, migration corridors, regular and regular large concentrations in winter	Yes
Bighorn sheep	<i>Ovis canadensis</i>			3	Game	Breeding areas, regular and regular large concentrations	Yes

## DIWA Federal and State Listed and Candidate Species

(Federal and State Endangered, Threatened, Sensitive and Candidates)

**NOTE:** Not all species on this list have been documented as occurring on the DIWA, but the habitat characteristics of the undocumented species occur on the DIWA and it is possible that they do occur, and for some this may be rarely. Based on results from formal surveys species may be deleted from this list. See Appendices 6a – 6e for complete lists of the birds, mammals, reptiles, amphibians, fishes and butterflies of the DIWA. (See internet sites <http://www.wdfw.wa.gov/wlm/diversity/soc/soc.htm>, <http://www.wdfw.wa.gov/hab/phsinvrt.htm>, <http://www.wdfw.wa.gov/hab/phsvert.htm>, and <http://www.wdfw.wa.gov/hab/phspage.htm>).

COMMON NAME	SCIENTIFIC NAME	ANIMAL TYPE	FEDERAL STATUS	STATE STATUS	Confirmed on DIWA	PHS Criteria
AMERICAN WHITE PELICAN	<i>PELECANUS ERYTHORHYNCHOS</i>	Bird	none	SE		B, RSC
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	Bird	FT	ST	Yes	B, RSC, CR
CALIFORNIA FLOATER	<i>ANODONTA CALIFORNIENSIS</i>	Mollusk	FSC	SC	Yes	IO
COLUMBIA SPOTTED FROG	<i>RANA LUTEIVENTRIS</i>	Amphibian	FSC	SC	Yes	IO
COMMON LOON	<i>GAVIA IMMER</i>	Bird	none	SS	Yes	B
FISHER	<i>MARTES PENNANTI</i>	Mammal	FC	SE		IO
GOLDEN EAGLE	<i>AQUILA CHRYSAETOS</i>	Bird	none	SC	Yes	B
HARLEQUIN DUCK	<i>HISTRIONICUS HISTRIONICUS</i>	Bird	none	none	Yes	None
LEOPARD DACE	<i>RHINICHTHYS FALCATUS</i>	Fish	none	SC		None
LEWIS' WOODPECKER	<i>MELANERPES LEWIS</i>	Bird	none	SC	Yes	B
LOGGERHEAD SHRIKE	<i>LANIUS LUDOVICIANUS</i>	Bird	FSC	SC		B
MERLIN	<i>FALCO COLUMBARIUS</i>	Bird	none	SC	Yes	B
MOUNTAIN SUCKER	<i>CATOSTOMUS PLATYRHYNCHUS</i>	Fish	none	SC		IO
NORTHERN GOSHAWK	<i>ACCIPITER GENTILIS</i>	Bird	FSC	SC	Yes	B
PEREGRINE FALCON	<i>FALCO PEREGRINUS</i>	Bird	FSC	SS		B, RI
PILEATED WOODPECKER	<i>DRYOCOPUS PILEATUS</i>	Bird	none	SC	Yes	B
SANDHILL CRANE	<i>GRUS CANADENSIS</i>	Bird	none	SE	Yes	B, RLC
SILVER-BORDERED FRITILLARY	<i>BOLORIA SELENE ATROCOSTALIS</i>	Butterfly	none	SC	Yes	IO
TOWNSEND'S BIG-EARED BAT	<i>CORYHORHINUS TOWNSENDII</i>	Mammal	FSC	SC	Yes	B, CR
UMATILLA DACE	<i>RHINICHTHYS UMATILLA</i>	Fish	none	SC		None
VAUX'S SWIFT	<i>CHAETURA VAUXI</i>	Bird	none	SC	Yes	B, CR
WESTERN TOAD	<i>BUFO BOREAS</i>	Amphibian	FSC	SC	Yes	None
YELLOW-BILLED CUCKOO	<i>COCCYZUS AMERICANUS</i>	Bird	FC	SC		B, RI

Federal Endangered (FE), Federal Proposed Endangered (FPE), Federal Threatened (FT), Proposed Federal Threatened (FPT), Federal Candidate (FC), Federal Species of Concern (FSC), State Endangered (SE), State Threatened (ST), State Sensitive (SS), State Candidate (SC)

**State Endangered Species** -A species native to the State of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state. As designated in Washington Administrative Code 232-12-014

**State Threatened** - A species native to the state of Washington that is likely to become endangered within the foreseeable future throughout a significant portion of its range within the state without cooperative management or removal of threats. As designated in Washington Administrative Code 232-12-011

**State Sensitive** - A species native to the state of Washington that is vulnerable or declining and is likely to become endangered or threatened in a significant portion of its range within the state without cooperative management or removal of threats. As designated in Washington Administrative Code 232-12-011

**State Candidate** - Species that the Department will review for listing as State Endangered, Threatened, or Sensitive. The Department reviews species for listing following procedures in Washington Administrative Code 232-12-297. Public comment is solicited before the Department takes its listing recommendation to the Washington Fish and Wildlife Commission, which makes listing decisions. Listing is based solely on the biological status of the species.

**PHS Criteria:** B: Breeding Location (Nest or Den)  
RC,RLC,RSC: Regular (Large or Small) Concentration  
IO: Individual Occurrence

CR: Communal Roost  
RI: Regular Individual

**DIWA Priority Habitats as related to the DIWA**

Habitat Type or Element	Priority Area
<p><b>Freshwater Wetlands and Deep Freshwater</b></p>	<p><u>Freshwater Wetlands:</u> Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands must have one or more of the following attributes: the land supports, at least periodically, predominantly hydrophytic plants; substrate is predominantly undrained hydric soils; and/or the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.</p> <p><u>Fresh Deepwater:</u> Permanently flooded lands lying below the deepwater boundary of wetlands. Deepwater habitats include environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. The dominant plants are hydrophytes; however, the substrates are considered nonsoil because the water is too deep to support emergent vegetation. These habitats include all underwater structures and features (e.g., woody debris, rock piles, caverns).</p>
	<p><b>Criteria:</b> Comparatively high fish and wildlife density and species diversity, important fish and wildlife breeding habitat, important fish and wildlife seasonal ranges, limited availability, high vulnerability to habitat alteration</p>
	<p>The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.</p>
<p><b>Instream</b></p>	<p><b>Criteria:</b> Comparatively high fish and wildlife density and species diversity, important fish and wildlife seasonal ranges, limited availability, high vulnerability to habitat alteration, dependent species.</p>
<p><b>Old-growth/Mature Forest</b></p>	<p>Old-growth east of Cascade crest: Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be &gt;150 years of age, with 25 trees/ha (10 trees/acre) &gt; 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 - 3 snags/acre) &gt; 30-35 cm (12-14 in) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions.</p> <p>Mature forests: Stands with average tree diameters exceeding 53 cm (21 in) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west and 80 - 160 years old east of the Cascade crest.</p>
	<p><b>Criteria:</b> High fish and wildlife density, high fish and wildlife species diversity, important fish and wildlife breeding habitat, important fish and wildlife seasonal ranges, limited and declining availability, high vulnerability to habitat alteration.</p>
<p><b>Riparian</b></p>	<p>The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems, which mutually influence each other. In riparian systems, the vegetation, water tables, soils, microclimate, and wildlife inhabitants of terrestrial ecosystems are influenced by perennial or intermittent water. Simultaneously, the biological and physical properties of the aquatic ecosystems are influenced by adjacent vegetation, nutrient and sediment loading, terrestrial wildlife, and organic and inorganic debris. Riparian habitat encompasses the area beginning at the ordinary high water mark and extends to that portion of the terrestrial landscape that is influenced by, or that directly influences, the aquatic ecosystem. Riparian habitat includes the entire extent of the floodplain and riparian areas of wetlands that are directly connected to stream courses.</p>



	<p><b>Criteria:</b> High fish and wildlife density, high fish and wildlife species diversity, important fish and wildlife breeding habitat, important wildlife seasonal ranges, important fish and wildlife movement corridors, high vulnerability to habitat alteration, unique or dependent species.</p>
<p><b>Rural natural open space</b></p>	<p>priority species resides within or is adjacent to the open space and uses it for breeding or regular feeding; and/or the open space functions as a corridor connecting other <i>priority habitats</i>, especially areas that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and surrounded by agricultural developments. Local consideration may be given to open space areas smaller than 4 ha (10 acres).</p> <p><b>Criteria:</b> Comparatively high fish and wildlife density, high fish and wildlife species diversity, important fish and wildlife breeding habitat, important fish and wildlife seasonal ranges, important fish and wildlife movement corridors, high vulnerability to habitat alteration, unique species assemblages in agricultural areas.</p>

## **APPENDIX 7 Eastern Okanogan County Citizen Advisory Group**

Vacant, Weed Board, P.O.Box 791, Okanogan, WA. 98840,  
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[sbarnes@nvinet.com](mailto:sbarnes@nvinet.com)

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George Wooten, private individual,  
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## **APPENDIX 8 Grant Sources, Supporting Agencies and Organizations**

Mule Deer Foundation <http://www.muledeer.org/>  
Ruffed Grouse Society <http://www.ruffedgrousesociety.org/index.asp>  
Foundation for North American Wild Sheep <http://www.fnaws.org/>  
Ducks Unlimited <http://www.ducks.org/>  
United States Department of Agriculture (USDA)  
    Forest Service (FS) <http://www.fs.fed.us/>  
    Natural Resource Conservation Service (NRCS) <http://www.nrcs.usda.gov/>  
United States Department of the Interior (USDI)  
    Bureau of Land Management (BLM) <http://www.blm.gov/nhp/index.htm>  
    Fish and Wildlife Service (F&WS) <http://www.fws.gov/>  
    Bureau of Indian Affairs (BIA) <http://www.doi.gov/bureau-indian-affairs.html>  
Oroville Gun and Sportsmen's Club  
Okanogan Valley Land Council <http://www.ovlandcouncil.org/>  
The Nature Conservancy <http://www.nature.org/>

**APPENDIX 9 Grants Received – Source – Amount**

Driscoll Island riparian fencing and water development – NRCS, WHIP -

## APPENDIX 10 Literature Cited and References

### Literature Cited

Demarchi, D. A. 1975. Report and recommendations of the workshop on California bighorn sheep *in: The Wild Sheep in Modern North America*, pp. 143-163. Winchester Press. New York. 302 pp.

Gray, R.W. 2001. The effect of stand structure and fire regime alterations on Bighorn sheep habitat. Unpublished Report. 39pp.

Johnson, R. 1983. Mountain goats and mountain sheep of Washington. i-vii + 196 pp.

RJR & Associates, 2004

Smith, T. S., P.J. Hardin, and J.T. Flinders. 1999. Response of bighorn sheep to clear-cut logging and prescribed burning. *Wildlife Society Bulletin* 27:840-845

Schneegas, E.R., R.S. Bumstead. 1977. Decline of western mule deer populations: probable cause, tentative solution. A presentation at the fifty-seventh Annual Conference of the Western Association of State Game and Fish Commissioners in Tucson, Arizona. July 12, 1977.

Soil Survey of Okanogan County Area, Washington. 1980. United States Department of Agriculture Soil Conservation Service in cooperation with Washington State University Agricultural Research Center. i-vi + 153 pp. + 107 maps.

Visalli, D. 2003. Vascular plants of the Sinlahekin Wildlife Area. 35 pp.

Washington Department of Fish and Wildlife. 2003. Game Management Plan, (<http://wdfw.wa.gov/wlm/game/management>)

Washington Department of Fish and Wildlife, Olympia, Washington, USA

Wiley, J.K. 2004. Feds, volunteers help sheep spot predators. AP news release

## REFERENCES

Concepts, Ideas and Discussions

Disturbance Processes and Ecosystem Management

(<http://www.fs.fed.us/research/publications/disturb.htm>)

Landscape Ecology and Natural Disturbances: Relationships to Biodiversity

(<http://www.for.gov.bc.ca/hfd/pubs/docs/en/en10.htm>)

Wetlands in Washington - Volume 1: A Synthesis of the Science (Publication #05-06-006)

([http://www.ecy.wa.gov/programs/sea/bas\\_wetlands/volume1final.html](http://www.ecy.wa.gov/programs/sea/bas_wetlands/volume1final.html))

### Data and Records

Western Regional Climate Center ([wrcc@dri.edu](mailto:wrcc@dri.edu))

### Policies, Procedures, Permitting and Planning

Comprehensive Wildlife Conservation Strategy (<http://wdfw.wa.gov/wlm/cwcs>)

Hydraulic Code Chapter 77.55 RCW

(<http://www.leg.wa.gov/RCW/index.cfm?fuseaction=chapterdigest&chapter=77.55>)

State Environmental Policy Act (SEPA) Chapter 43.21C RCW

(<http://www.leg.wa.gov/pub/rcw/RCW%20%2043%20%20TITLE/RCW%20%2043%20.%2021C%20CHAPTER/RCW%20%2043%20.%2021C%20CHAPTER.htm>)

State Environmental Policy Act (SEPA) WDFW (<http://wdfw.wa.gov/hab/sepa/sepa.htm>)

Washington State Comprehensive Outdoor Recreation Plan

Wildlife Viewing Activities in Washington – A Strategic Plan

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

Wildlife Status Reports (as they relate to species found or potentially found on the DIWA)

Bald eagle

Burrowing owl

Common loon

Fisher

Lynx

Peregrine Falcon

Sharp-tailed grouse

Western gray squirrel

Wildlife Recovery Plans (as they relate to species found or potentially found on the DIWA)

Bald eagle

Band-tailed pigeon

Bighorn sheep

Black bear

Cougar

Deer

Fisher

Furbearers

Gray wolf

Grizzly bear

Lynx

Moose  
Mountain goat  
Sandhill crane  
Sharp-tailed grouse  
Upland birds  
Western gray squirrel  
Waterfowl

WDFW Goals and Objectives ([http://wdfw.wa.gov/depinfo/strat\\_goals\\_obj.htm](http://wdfw.wa.gov/depinfo/strat_goals_obj.htm))

WDFW Habitat Conservation and Recreation Plan 2004 – 2010

WDFW Policies and Procedures

WDFW Strategic Plan ([http://wdfw.wa.gov/depinfo/strat\\_goals\\_obj.htm](http://wdfw.wa.gov/depinfo/strat_goals_obj.htm))

Washington Forest Practices Act - Title 76.09 RCW (<http://www.dnr.wa.gov/forestpractices/rules/>)

Washington Forest Practices Rules – Title 222 WAC

(<http://www.dnr.wa.gov/forestpractices/rules/>)

### Management and Techniques

Species of Concern (<http://www.wdfw.wa.gov/wlm/diversity/soc/soc.htm>)

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

Priority Habitats and Species – Invertebrates (<http://wdfw.wa.gov/hab/phsinvrt.htm>) Priority

Habitats and Species – Vertebrates (<http://wdfw.wa.gov/hab/phsvert.htm>)

Priority Habitats and Species – General Information (<http://www.wdfw.wa.gov/hab/phspage.htm>)

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

As they relate to species found or potentially found on the DIWA

Volume I – Invertebrates (<http://wdfw.wa.gov/hab/vol1.htm>)

California floater

Silver-bordered bog fritillary

Volume II – Fish and Marine Invertebrates (In development by Agency)

Volume III – Amphibians and Reptiles

Columbia spotted frog

Volume IV – Birds

American white pelican

Bald eagle

Band-tailed pigeon

Blue grouse

Burrowing owl

Cavity-nesting ducks

Chukar

Common loon

Golden eagle

Great blue heron

Harlequin duck

Lewis' woodpecker

Northern goshawk

Peregrine falcon

Pileated woodpecker

Prairie falcon

Ring-necked pheasant  
Sandhill crane  
Shorebirds  
Vaux's swift  
Wild turkey  
Volume V – Mammal (In development by Agency)  
Pallid bat

Design of Road Culverts for Fish Passage

([http://wdfw.wa.gov/hab/engineer/cm/culvert\\_manual\\_final.pdf](http://wdfw.wa.gov/hab/engineer/cm/culvert_manual_final.pdf))

Stream Habitat Restoration Guidelines (SHRG) (<http://wdfw.wa.gov/hab/ahg/shrg/index.htm>)

Integrated Streambank Protection Guidelines (ISPG) (<http://wdfw.wa.gov/hab/ahg/ispgdoc.htm>)

Wetlands in Washington - Volume 2: Guidance for Protecting and Managing Wetlands  
(Publication #05-06-008) ([http://www.ecy.wa.gov/programs/sea/bas\\_wetlands/volume2final.html](http://www.ecy.wa.gov/programs/sea/bas_wetlands/volume2final.html))

Woodland Fish and Wildlife Project Publications (<http://www.woodlandfishandwildlife.org/>)

Salmon and Steelhead Habitat Inventorying and Assessment Program (SSHIAP)

(<http://wdfw.wa.gov/hab/sshiap/>)

Information Related to Growth Management Act (<http://www.wdfw.wa.gov/hab/gmapage.htm>)

Aquatic Habitat Guidelines (AHG) Program Information (<http://wdfw.wa.gov/hab/ahg/>)