

SINLAHEKIN WILDLIFE AREA MANAGEMENT PLAN

Washington Department of Fish and Wildlife



Photo: Andrew Seccomb

Prepared by Wildlife Area Manager, Dale Swedberg



2006

STATE OF WASHINGTON

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Washington State Wildlife Area Plan

SINLAHEKIN WILDLIFE AREA

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

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Sinlahekin Wildlife Area

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Director, Washington Department of Fish and Wildlife

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EXECUTIVE SUMMARY

The Sinlahekin Wildlife Area (SWA) (~14,000 acres) was established, by the Washington Department of Fish & Wildlife (WDFW), in 1938 for the purpose of protecting and managing mule deer winter range in the Sinlahekin Valley about 2.5 miles south of Loomis, Okanogan County, Washington State. Most of the property was acquired through fee title purchases using Federally administered Pittman-Robertson Funds (PR funds) generated through a federal excise tax on firearms and ammunition. Additional lands were acquired through title transfer from the Federal Government. About 2,800 acres of federal lands under Bureau of Land Management (BLM) administrative authority were withdrawn by Presidential Executive Order and turned over to Washington Department of Fish & Wildlife for management as part of the “Sinlahekin deer winter range”. Today, management of the SWA is with the intend to provide functional habitat based on historic ecosystem processes and habitat dynamics to sustain populations of all species of fish and wildlife present and in at least one case create habitat conditions that will allow reintroduction and sustainability of a mountain goat population which has been extirpated, since the late 1970’s, by habitat degradation through fire exclusion. Further the SWA is managed to provide fish and wildlife oriented recreational opportunities.

SWA has the distinction of being the oldest Wildlife Area in Washington State. Management goals for the SWA 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 educational, recreational and research opportunities for the public to encounter, utilize, and appreciate fish and wildlife and where they live.

Recognized for its value as mule deer winter range in the mid-1930’s, lands in the Sinlahekin Valley were acquired. The first parcels were purchases from Okanogan County at a tax sale in 1939, using Federal Aid in Wildlife Restoration Funds (Pittman-Robertson Act) generated from federal excise taxes on firearms and ammunition.

Most of the private lands and Indian Allotment lands now comprising the SWA were subjected to grazing, dryland and irrigated agriculture and some logging. Most of the Federal lands, which are part of the SWA, had limited mining, grazing and logging. Fire exclusion has been a primary focus on all lands within the SWA, however prescribed burning to a small degree was used in the past. In the 1950’s exotic shrubs were planted as an experiment to determine what species of shrubs could be planted to enhance browse for deer. A number of these plantings can still be seen and many have died out from weed control efforts, fire or climatic conditions.

The SWA 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 management, including weed control, of SWA, Driscoll Island and Chiliwist Wildlife Areas. The Federal Aid in Wildlife Restoration funds are matched, at a ratio of \$4 Federal Aid funds to \$1 of state funds, by other

funds generated by WDFW through license and tag sales. The Department will, as part of the implementation of this plan, continue to submit grant proposals and applications and identify other strategies to address unfunded management needs on the SWA.

The 510+ species of vascular plants found on the SWA contributes to a diversity of vegetative communities plus the rocks, cliffs, streams, lakes and ponds, which collectively form the various habitats for the birds, mammals, herptiles (reptiles and amphibians), and fish. Over 215 species of birds, 60 species of mammals, about 20 species of reptiles and amphibians, over 25 species of fish and 90+ species of butterflies are confirmed or suspected of being present on the SWA during some part of their life cycle. In addition to factors already identified other factors contributing to, and allowing for, the tremendous wildlife diversity include: Elevation range: 1,100' to over 4,000' ASL, Temperature range: -20° to 110° Fahrenheit, Precipitation range: 12" – 20" annually and Slope range: level ground to vertical rock cliffs.

Big game hunting, upland game bird and forest grouse hunting, fishing, bird watching, wildlife watching, hiking, horseback riding, trapping and camping are the primary wildlife oriented recreational pursuits enjoyed by many people since the SWA came into existence. Historically the SWA has been a destination for excellent Mule deer hunting, however, in the last 30 – 40 years, White-tailed deer have become the dominant species present.

Primary management concerns and public issues identified in the Sinlahekin Wildlife Area Management Plan include:

- Complete Connor to Forde Lake and Forde Lake to south Blue Lake trail projects
- Complete Doheny WHIP project
- Complete Mule Deer Foundation Rx burn project
- Continue aggressive weed control efforts
- Prepare and implement a fuels treatment project in area logged winter of 2003-04 in preparation for coordinated fuels treatment and Rx burn with USFS
- Complete Fire Regime Condition Classification (FRCC) mapping
- Survey and/or mark/sign a minimum of 10 miles of SWA boundary
- Complete layers on SWA GIS project including Fence, Fence features, artificial nest structures, roads, culverts, campsites, toilets, signs, reader boards, power poles.
- Visit all known Dalmatian Toadflax and Russian knapweed sites at least twice to monitor and initiate appropriate treatment.
- Complete self-guided tour project
- Work with private, county, state and federal land managers to promote use of prescribed fire, in a coordinated effort on all lands, to improve wildlife habitat, i.e., North Central Washington Prescribed Fire Council
- Apply for at least one grant or other funding opportunities consistent with planned priorities to supplement funding

CHAPTER 1. INTRODUCTION

This plan provides management direction for the Sinlahekin Wildlife Area (SWA) and 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 Sinlahekin Wildlife Area Goals

Management goals for the SWA 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 educational, recreational and research opportunities for the public to encounter, utilize, and appreciate fish and wildlife and where they live. Specific management goals and objectives for the Sinlahekin Wildlife Area can be found in Chapter 3.

1.5 Planning Process

A multifaceted approach has been undertaken to identify strategies proposed for management of the SWA. 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 Citizen's 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 SWA. 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 SWA management practices and help build constituencies for the SWA. 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. This CAG is known as the Eastern Okanogan County CAG (EOC CAG). A list of EOC CAG representatives is in [APPENDIX 8](#). 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 OC 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 SWA plan will be reviewed annually with additional input from the EOC CAG and OC DT to monitor performance and desired results. Strategies and activities will be adapted where necessary to accomplish management objectives.

The final SWA 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 SWA 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 SWA by the Washington State legislature and Federal entities. In short the SWA 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 SWA is accomplished with the idea of being a good neighbor with adjacent landowners.

CHAPTER II. AREA DESCRIPTION AND MAP

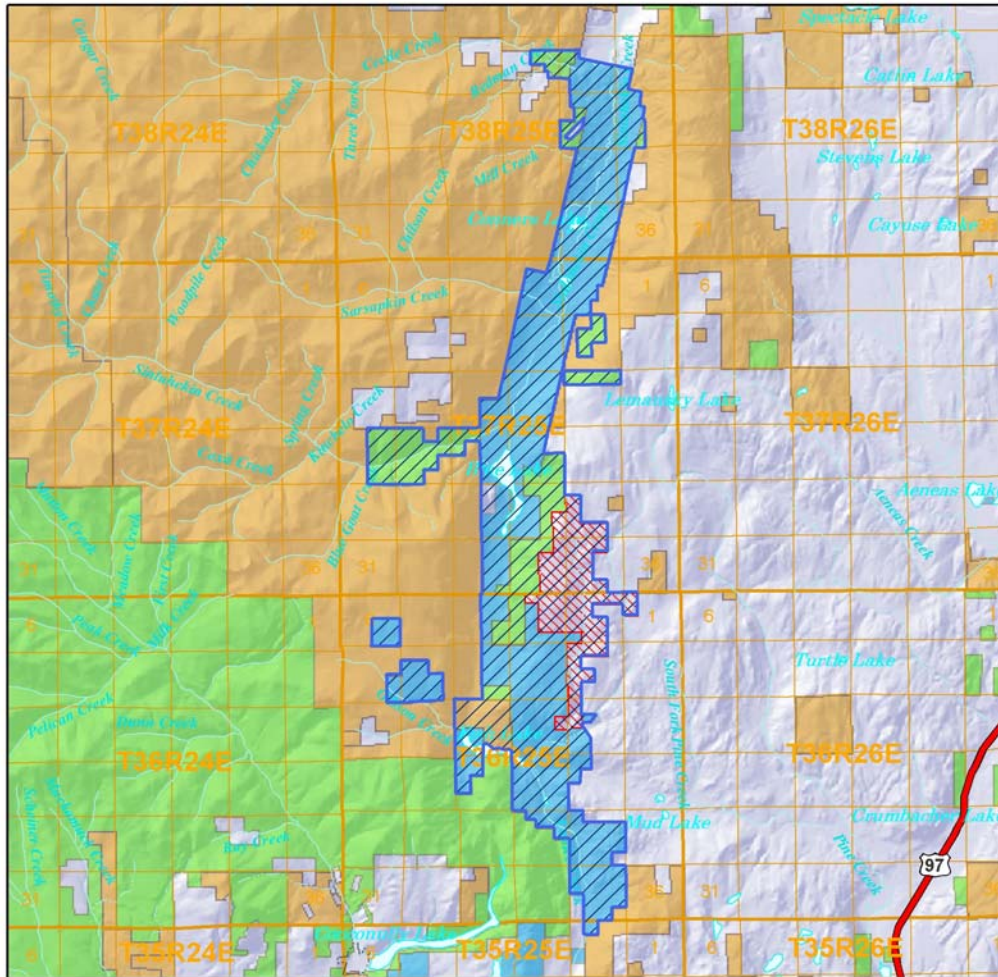
2.1 Property Location and Size

In North-Central Washington, located about 2.5 miles south of Loomis, Okanogan County, primarily within the glaciated Sinlahekin Valley, the SWA is characterized by steep slopes rising from the valley floor at about 1,300' ASL to the mountaintops over 4,000' ASL.

To date the Sinlahekin Wildlife Area (SWA) is comprised of about 14,000 acres. Of this acreage, 480 acres are leased from Washington Department of Natural Resources (DNR), 2,834 acres are Federally owned under United States Department of Interior - Bureau of Land Management (BLM) jurisdiction and the remaining acreage, about 11,000 acres, is owned by the Washington Department of Fish and Wildlife (WDFW). SWA has the distinction of being the oldest Wildlife Area in Washington State.

All lands owned and/or managed as the SWA are located in T38N R25E Sections 11-15, 24-26, 34-36; T37N R25E Sections 2, 3, 9-11, 14-16, 19-22, 27, 28, 32, 33; T36N R25E Sections 2-4, 6-10, 14-16, 18, 22-23, 26, 27, 35; T35N R25E Section 2.

Figure 1. Sinlahekin Wildlife Area



Washington Department of Fish and Wildlife

- Sinlahekin 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

Hydrography

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

Transportation Network

- Interstate Highway
- US Highway
- State Route

1:185,000

1 inch equals 2.9 miles

2.2 Purchase History and Purpose

Recognized for its value as mule deer winter range in the mid-1930's, lands in the Sinlahekin Valley were acquired. The first parcels were purchases from Okanogan County at a tax sale in 1939, using Federal Aid in Wildlife Restoration Funds (Pittman-Robertson Act) generated from federal excise taxes on firearms and ammunition.

Most of the private lands and Indian Allotment lands now comprising the SWA were subjected to grazing, dryland and irrigated agriculture and some logging. Most of the Federal lands, which are part of the SWA had limited mining, grazing and logging. Fire exclusion has been a primary focus on all lands within the SWA, however prescribed burning to a small degree was used in the past.

In the 1950's exotic shrubs were planted as an experiment to determine what species of shrubs could be planted to enhance browse for deer. A number of these plantings can still be seen and many have died out from weed control efforts, fire or climatic conditions.

Presently food plots are maintained in the form of dryland spring grains (about 60 acres), dryland alfalfa (about 60 acres) and irrigated alfalfa (about 45 acres). These were initiated in the 1940's and maintained by the Wildlife Area Manager with the exception of the alfalfa, which is maintained by 2 Sharecroppers operating under an agreement.

The management of cattle grazing is used as a tool to manipulate vegetation to benefit wildlife under 4 grazing permits. The object is to crop grasses to reduce competition with browse species and remove residual vegetation, which allows easier access to the new growth to benefit deer. Additionally, studies have shown that grazing will increase the forbs composition of the plant community, which benefits deer as well (Schneegas and Bumstead 1977).

2.3 Ownership and Use of Adjacent Lands ([APPENDIX 7](#))

The majority of land ownership adjacent to the SWA is DNR with 57.4% of the boundary being common to SWA and DNR. The remaining ownership with common a boundary to the SWA is 24.4% of adjacent private property and 8.9% of boundary adjacent to United States Forest Service. The habitat types and characteristics of these adjacent lands are much the same as the SWA.

Frequent communication with adjacent landowners regarding the management of WDFW lands and adjacent lands, is essential to developing a good relationship and effectively resolving issues promptly. [APPENDIX 7](#) has contact information for adjacent landowners.

2.4 Funding

The SWA complex including SWA, Driscoll Island Wildlife Area and Chiliwist Wildlife Areas 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 management, including weed control, of SWA, Driscoll Island and Chiliwist Wildlife Areas. The Federal Aid in Wildlife Restoration funds are matched, at a ratio of \$4 Federal Aid funds to \$1 of state funds, by other funds generated by WDFW through license and tag sales. Additionally other funds have been made available to the SWA for equipment acquisition and grant match funds. Recently grants have been obtained through the National Fire Plan for the following: 1) to conduct a vegetation inventory, including a

weed inventory, 2) to conduct a timber stand assessment and fuels analysis, 3) to conduct a partial fire history analysis, 4) to develop silvicultural, fuels treatment and burn prescriptions, 5) to develop a prescription implementation strategy with public involvement and 6) to develop a self guide tour and informational materials concerning Fire Ecology, fuels treatments and prescribed burning. Other grant moneys have been received for prescribed burning from the Mule Deer Foundation and the Okanogan Similkameen Conservation Corridor Project. Recently a WHIP grant was received from the Natural Resource Conservation Service to fence wetlands and plant water birch to enhance Sharp-tailed grouse winter habitat. Income from sharecropping agreements and grazing permits is used for operations and maintenance.

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

2.5 Climate

The SWA 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 temperature range is -20° to 110° Fahrenheit and the average precipitation range is 12” – 20” annually. ([APPENDIX 5](#)) - Climatic Information



Sinlahekin WLA, Fall



Sinlahekin WLA, Winter

2.6 Physiography

SWA is primarily within the Sinlahekin Valley, a north – south deep glaciated valley, with sheer rock, cliff mountain side walls rising from the valley floor at about 1,300 feet Above Sea Level (ASL) to over 4,000 feet ASL at the higher parts of the SWA. The relatively level valley ranges from about .5 mile to 1 mile wide.

Aspects found on the SWA include primarily East and West slopes with all other aspects, i.e., North, NE, SE, SW, and NW represented as well. These slopes range from level ground to vertical rock cliffs.

2.7 Soils and Geology

Most of soils of the SWA have not been mapped, however an initial soil survey was completed in the early 2000's. Parts of the SWA soil survey most recently completed, i.e., 1980, can be found in 'Soil Survey of Okanogan County Area, Washington'⁷.

Known soil associations on the SWA include general descriptions of "deep to very shallow mostly forested soils and rock outcrop on mountainous uplands" and "deep to very shallow mostly grassland soils, rock outcrop and badland on dissected upland plains and terraces." A subcategorical description under the first general description is Molson-Lithic Xerochrepts-Koepke association: Deep, shallow, and very shallow, well drained soils. A subcategorical description under the second general description is "Conconully-Lithic Xerochrepts-Haley association: Deep, shallow and vary shallow well drained soils."⁷

In 2005 a new tentative soil series was named 'Sinlahekin Series' and described for soils found in the Sinlahekin Valley and on Sinlahekin Wildlife Area. Details can be seen at <http://www2.ftw.nrcs.usda.gov/osd/dat/S/SINLAHEKIN.html>

WDFW should, and plans to, continue to partner with the Natural Resource Conservation Service's Soil Survey Section to complete the soil surveys and mapping for the SWA.

2.8 Hydrology and Watersheds

The SWA is within two watersheds, the Sinlahekin Creek and the Coulee Creek Watersheds. Sinlahekin Creek Watershed includes all drainages and tributaries north of and starting from Blue Lake including Sinlahekin Creek, Sarsapkin Creek, Cecile Creek and numerous other unnamed tributaries. Additionally there are 4 impoundments in this system including Forde Lake, Reflection Pond, Conner Lake and Headquarters Driveway impoundment. Sinlahekin Creek flows northward into Palmer Lake from the SWA. Although Blue Lake is a historically natural lake



Blue Lake

Photo: John Hansen

efforts were made in the late 1910's to early 1920's to use it as a storage reservoir by building a dam on the north end and diverting a portion of the flow from Sinlahekin Creek into Blue Lake. The dam proved to be incapable of significant water storage because of leakage. Subsequently the dam was modified with a "notch" cut through the dam on the western side to allow water to flow out after reaching the level of the "notch". Thus Blue Lake is larger and contains more water than

it did prior to Sinlahekin Creek being diverted into it. Water flow through the “notch” does not occur on a regular basis.

Coulee Creek Watershed includes Spikeman Creek and Gibson Creek drainages, Hicks Canyon aka “Stalder” Creek/Sasse Pond drainages, Fish Lake and south through Coulee Creek Canyon. Additionally there is an impoundment, Schalow Pond and, a natural lake, Doheny Lake. Sasse Pond is an impoundment that holds water throughout mid to late summer during wet years. Coulee Creek flows southward out of the SWA and goes underground most of the year. However, during a series of exceptionally wet years, it may flow into Hess Lake and Johnson Creek near the Conconully Highway.

In addition, three potholes and 1 other small pond are found on the SWA. Blue Lake Potholes #1, #2 and #3, numbered North to South, are found just south east of Blue Lake. Zachman Pond is located on top of the ridge south and east of Blue Lake.

2.9 Fire History

Preliminary investigations into the fire history of the SWA show an average fire return/fire return interval of about 3 years. This indicates that historically, fires would burn on the SWA on an average of every 3 years. This “fire history” was detected by analyzing samples collected for a fire scar survey. This places the historic fire regime for most of the SWA in the “frequent low-severity” class. Under this regime the landscape would be scattered large ponderosa pine trees with mostly grasses, forbs and scattered shrubs. Additional evidence of this can be seen in photos taken around 1910. These photos can be seen on the Internet at http://wdfw.wa.gov/lands/wildlife_areas/sinlahekin/gallery_historical.htm. Smaller portions of the SWA would be classed as Mixed-severity Fire Regime and Severe Fire Regime or Stand Replacing Fire Regime.

Today, the increased density of young ponderosa pine trees, the encroachment of pines into shrub steppe and Douglas fir into pine stands, represents a change in stand composition and structure due to the absence of fire (60 – 100 years) on the SWA landscape. Additionally long-term fire suppression has contributed to a greater component of brush development on the landscape.

Another result of fire suppression is the component of early and mid-successional plant communities are in the minority. It is well known that these plant communities support the greatest diversity of wildlife species. Many of the fire dependent plant species are in decline and plant communities are less diverse trending toward homogeneity.

2.10 Vegetation Characterization

Over 510 different vascular plants species are found on the SWA and 9 rare vascular plants were documented on the SWA⁷. Dominant habitat types found on the Sinlahekin include Shrub-steppe including 7 subtypes characterized by Bluebunch Wheatgrass, Big Sage, Bitterbrush and Serviceberry; Wetland including 5 subtypes characterized by Hawthorn, Water birch, Mountain Alder, grass/sedges, and shoreline; Dry site forest including 2 subtypes characterized by Ponderosa pine, Douglas fir, Bluebunch Wheatgrass, and Serviceberry⁷. Refer to [APPENDIX 6](#) for vegetation species lists.



2.11 Important Habitats

Shrub-steppe – This habitat type is significant habitat for sharp-tailed grouse restoration efforts.

Wetland—Areas with surface water present or saturated soils during a portion of the growing season that generally support primarily hydrophytic plants. Like riparian areas, wetlands generally support a high diversity of fish and wildlife species.

Late Seral Ponderosa Pine – This habitat type is important for a number of wildlife species including late seral ponderosa pine obligates such as the pygmy nuthatch, White-headed woodpecker and Flammulated owl.

Rocks and cliffs – This “broken terrain” habitat is significant for Golden eagle nesting habitat and other diversity species.

Flowers, Rocks and Cliffs Photo: Dale Swedberg

2.12 Fish and Wildlife

The 510+ species of vascular plants found on the SWA contributes to a diversity of vegetative communities plus the rocks, cliffs, streams, lakes and ponds, which collectively form the various habitats for the birds, mammals, herptiles (reptiles and amphibians), and fish. Over 215 species of birds, 60 species of mammals, about 20 species of reptiles and amphibians, over 25 species of fish and 90+ species of butterflies are confirmed or suspected of being present on the SWA during



Pacific Treefrog (Pseudacris regilla) Photo: Dale Swedberg



Sheridan’s Hairstreak Butterfly (Callophrys sheridanii) Photo: Dale Swedberg

some part of their life cycle. In addition to factors already identified other factors contributing to, and allowing for, the tremendous wildlife diversity include: Elevation range: 1,100’ to over 4,000’ ASL, Temperature range: –20° to 110° Fahrenheit, Precipitation range: 12” – 20” annually and Slope range: level ground to vertical rock cliffs. Refer to [APPENDIX 6](#) for Fish and Wildlife specieslists; Appendix [6a](#) for SWA bird species list; Appendix [6b](#) for SWA mammal species list; Appendix [6c](#) for SWA

herptile – reptile & amphibian species list; Appendix [6d](#) for SWA fish species list; Appendix [6e](#) for SWA butterfly species list; Appendix [6f](#) for SWA mollusk species list; Appendix [6g](#) for SWA Odonata – dragonfly & damselfly species list; and Appendix [6h](#) for SWA spider species list.

2.13 History of User Groups/Recreation Use

Big game hunting, upland game bird and forest grouse hunting, fishing, bird watching, wildlife watching, hiking, horseback riding, trapping and camping are the primary wildlife oriented recreational pursuits enjoyed by many people since the SWA came into existence.

Historically the SWA has been a destination for excellent mule deer hunting, however, in the last 30 – 40 years, white-tailed deer have become the dominant species present. SWA still provides excellent deer hunting opportunities. Additional hunting opportunities for big game include black bear and cougar. Traditionally, bighorn sheep hunting was available by permit, but these permits have not been available since the mid 1990's. From the late 1800's through 1970's there was a small population of mountain goats on the SWA in the rugged terrain near Blue Lake, but none have been seen there since 1982. Occasionally, moose wander through the SWA. Upland game bird and forest grouse hunting has been an historically popular activity particularly when pen raised ring-necked pheasants were released in the 1950's, 60's and 70's. The SWA still supports a fair number of ring-necked pheasants, lots of California quail and a few Hungarian partridges. The forest grouse are a native upland game bird and they include blue grouse and ruffed grouse, both of which are still abundant. Also an occasional, now protected, sharp-tailed grouse may be found. Fishing has been a huge attraction for fishermen to the SWA. In 1950's the former Game Department constructed 5 dams creating impoundments: Schalow Pond, Forde Lake, Reflection Pond, Conner Lake and Headquarters driveway. All of these lakes have continually been stocked with trout in addition to the wild production of Brook Trout, Rainbow and Cutthroat Trout. Blue Lake, maintained by a diversion of water from Sinlahekin Creek for irrigation storage, was historically a "put and take" fishery until the 1990's when it was converted to a Selective Fishery that has turned into one of the Blue Ribbon Selective fisheries in Washington. Many local people who live in the area near the SWA drive through and/or camp on a regular basis to enjoy the wildlife and outdoor experiences offered.

2.14 History of Issues

In addition to protecting the lands of the Sinlahekin Valley for Mule deer winter range and providing public hunting and fishing, the Sinlahekin land purchase also involved buying lands where deer were becoming a huge problem by causing damage.

Bighorn Sheep

In 1957, 18 California bighorn sheep were captured near Williams Lake, B.C. and translocated to the SWA in an effort to reintroduce California bighorn sheep to Washington. The effort was successful resulting in reestablishment of California bighorn sheep populations, this also resulted in transplanting some of the SWA herd to the Wooten Wildlife Area in 1960, the Colockum Wildlife Area in 1962, the Oak Creek Wildlife Area in 1967 and the Swakane Wildlife Area in 1969. From these translocations California bighorn sheep became well established in Washington, where they had been considered extirpated since the early 1900's.

Grazing

With changing philosophies the grazing continues to be a contentious issue. However, managed grazing has been demonstrated to be a useful tool for vegetation manipulation that benefits wildlife.

Weed ManagementWeeds, in particular dalmatian toadflax (*Linaria dalmatica*), baby's breath (*Gypsophila paniculata*), Russian knapweed (*Acroptilon repens*) and diffuse knapweed (*Centaurea diffusa*), continue to be a challenge requiring persistence and dedication to keep them under control. Biological control (biocontrol), the use of biological agents, e.g., beetles, moths, etc. as a control, of diffuse knapweed has been relatively successful.

Weed management on the SWA is being conducted using the concept of Integrated Pest Management (IPM), where methods of weed control including prevention; chemical, biological, mechanical and cultural controls are being used to effectively control the spread of weeds. In addition, the potential economic impacts are considered when making a decision to use a method of weed control, in terms of desired outcomes over the short and long-term. The management of weeds also requires cooperative efforts of all landowners and land managers as well as the general public.

2.15 Cultural Resources.

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

CHAPTER III. MANAGEMENT OBJECTIVES, ISSUES & STRATEGIES

Statewide goals and objectives listed in chapter one shape management priorities on wildlife areas. Specific wildlife area information including why the area was purchased, habitat conditions, species present, and public issues and concerns are evaluated to identify wildlife area activities or strategies. *Public issues from the East Okanogan County Citizens Advisory Group (EOC CAG) are noted in italics and are captured in Appendix 1.* Objectives and associated strategies or tasks specific to the SWA 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 SWA 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. Knowledge about all species present will allow for more informed decision-making.

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-objectives: 1, 2, 3, 4, 5, 6, 7, 8, and 12.

2. Inventory and map distribution of all species of flora

Knowledge of occurrence, distribution, and abundance of flora on the SWA 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: 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, Agency support. TIMEFRAME: Ongoing grant search and application

B. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objectives: 9, 10, 11, 12, 13, 14, and 15.

3. Inventory and map all historic and contemporary plant communities

Knowledge of historic and contemporary plant communities, in particular fire history as determined from fire scars, provides an opportunity for comparative analysis of historic conditions relative to current conditions. Fire history data can then be mapped displaying the area and extent of historic fires on the SWA. Additionally historic stand assessments can be done and mapped on forested areas. Sediment cores can be taken from potholes, which would reveal additional information about historic plants through pollen deposition

in sediment layers. Additional fire history can be examined from charcoal in sediment layers as well. With historic conditions documented, which are often touted as the “future” desired condition, and mapped. Such knowledge, incorporated into SWA 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 on the plant communities and ultimately influenced the wildlife species, can also be incorporated into site-specific educational material with the aid of computer animation. 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 fire history analysis.** POTENTIAL FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., USFS, Agency support. TIMEFRAME: Ongoing grant search and application
- B. Strategy: Conduct historic forest stand analysis.** POTENTIAL FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., USFS, Agency support. TIMEFRAME: Ongoing grant search and application
- C. Strategy: Conduct historic fire analysis based on charcoal deposition in sediment layers from potholes.** POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., USFS, Agency support. TIMEFRAME: Ongoing grant search and application
- D. Strategy: Conduct historic vegetation presence from pollen deposition in sediment layers from potholes.** POTENTIAL FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., USFS, Agency support. TIMEFRAME: Ongoing grant search and application
- E. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objectives: 9, 10, 11, 12, 13, 14, and 15.**

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 partially mapped on the SWA and what has been mapped has not been in detail.

- A. Strategy: Conduct a complete soils survey and map.** POTENTIAL FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., NRCS, Agency support. TIMEFRAME: Ongoing grant search and application

B. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objectives: 9, 10, 11, 12, 14, and 15.

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 SWA. 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 also Agency Objective: Develop, integrate and disseminate sound fish, wildlife and habitat science. Sub-objective 3, 4, 5 and 8.

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

C. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objectives: 9, 10, 11, 13, 14, 15.

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

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

C. Strategy: Acquire old air photos, get them georeferenced and acquire old orthophotos to do comparative analysis of vegetation and plant community changes on the SWA over time for purposes of correlating changes with management or disturbances to better understand the outcomes from management and/or disturbance regimes or lack thereof. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, and assistance from other agencies, i.e., USFS, Agency support. TIMEFRAME: Ongoing grant search and application.

D. Strategy: See Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objectives: 9, 10, 11, 12, 13, 14, and 15.

7. Establish photo transects and vegetation transects to monitor, over time, vegetation changes in response to management strategies. Continue monitoring of vegetation transects and ungulate exclosures established in the late 1940's.

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: Relocated old vegetation transects and markers, GPS and create GIS data layer and map of old transects. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., NRCS, BLM, other organizations, Agency support. TIMEFRAME: Ongoing grant search and application.

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

C. Strategy: Schedule regularly scheduled readings, e.g., decadal, bidecadal, etc., of all vegetation transects established in 1949 including ungulate exclosures. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., NRCS, BLM, other organizations, Agency support. TIMEFRAME: Ongoing grant search and application

D. Strategy: Locate, mark and GPS photo points of old photos taken in the Sinlahekin Valley. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, and assistance from other agencies, i.e., NRCS, BLM, other organizations, Agency support. TIMEFRAME: Ongoing grant search and application

E. Strategy: Schedule regular visits, e.g., annually, biennially, decadal, etc., to these transects to collect photos. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., NRCS, BLM, other organizations, Agency support. TIMEFRAME: Ongoing grant search and application

8. Conduct research on, document and map historic weather patterns

Historic weather patterns have significant influence on plant communities. In particular extremes such as droughts and wet periods of long duration influence plant species, communities and structure as well as influencing fire regimes. This data can be used in evaluating historic plant community dynamics, fire regimes and impacts on wildlife populations

A. Strategy: Research information on historic weather patterns and/or collect data from tree ring samples and sediment samples from potholes to determine historic weather patterns and their influence on ecosystem functions and ultimately influence on historic plant communities. Create maps of historic weather patterns.

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

9. 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 SWA.

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 SWA.

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

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

1. Manage big game populations

Mule deer

The SWA was purchased to protect and provide winter range for mule deer. Despite the protection of the Sinlahekin Valley from development and other winter range destruction, the mule deer population using the SWA has declined substantially, whereas the White-tailed deer population has increased dramatically. This is in large part due to nearly 100 years of fire suppression resulting in habitat conditions more suitable to White-tailed deer than mule deer. As a result of fire suppression, the open ponderosa pine savannah forest in which the Washington mule deer evolved has changed to dense stands of small ponderosa pine and Douglas fir. Ponderosa pine and Douglas fir have invaded areas that once were open steppe or shrub-steppe habitats. Additionally, the resulting habitat changes, e.g., early successional vegetation types have declined and late successional stages, favoring White-tailed deer, have increased. Habitat changes from fire exclusion include vegetation composition, vigor, nutritional quality, structural and species changes as well as homogenization of habitats, i.e., loss of a mosaic of habitats comprised of early to late successional stages and all the variability of plant community composition, vigor, nutritional quality, structure and species. Changes favoring White-tailed deer include increased brush and timber stand densities. The historic frequent fire regime of the SWA likely contributed to spatially decreased densities of parasites and diseases of mule deer.

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.”

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.”

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: Conduct, in cooperation with the Mule Deer Foundation and others, prescribed fuels treatment, e.g., thinning and logging on an average of 600 acres per year for 10 years to improve mule deer habitat quality. 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

B. Strategy: Conduct, in cooperation with the Mule Deer Foundation and others, prescribed burning on an average of 1000 acres per year for a 10-year rotation to improve mule deer habitat quality. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, grants when successful, qualified volunteers, graduate students, interns, and assistance from other agencies, i.e., BLM, USFS, DNR, USFWS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

C. 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.

D. 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 and Landowner Assistance. TIMEFRAME: Ongoing.

White-tailed Deer

White-tailed deer have become a dominant deer species on the SWA in the last 30 – 40 years. There is much speculation about why the White-tailed deer population has increased on SWA. The most plausible theory is that from nearly 100 years of fire suppression, the resulting habitat changes, e.g., early successional vegetation types have declined and late successional stages, favoring White-tailed deer, have increased. Habitat changes from fire exclusion include vegetation composition, vigor, nutritional quality, structural and species changes as well as homogenization of habitats, i.e., loss of a mosaic of habitats comprised of early to late successional stages and all the variability of plant community composition, vigor, nutritional quality, structure and species. Changes

favoring White-tailed deer include increased brush and timber stand densities. White-tailed deer are known to host at least one roundworm that can be lethal to mule deer, *Paralaphostrongylus sp.* *Local concern for numbers of White-Tailed deer on the Sinlahekin – not enough W-T deer. General feeling that a long season results in W-T being run out of country and onto private ground. Long time bow hunting camps will be moving out of Sinlahekin if things don't improve next hunting season (2005).*

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.”

Objective 58 under White-tailed deer management states:
“Try to maintain current status of white-tailed deer habitat.”

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: Conduct, in cooperation with others, prescribed fuels treatment, e.g., thinning and logging on an average of 600 acres per year for 10 years to improve white-tailed deer habitat quality. 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: Conduct, in cooperation with others, prescribed burning on an average of 1000 acres per year for a 10-year rotation to improve white-tailed deer habitat quality. POTENTIAL FUNDING: Federal Aid, State Wildlife Account, 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

California Bighorn Sheep

Initial efforts to reintroduce California bighorn sheep to Washington State were on the SWA. Progeny of the 1957 release of California bighorn sheep on the SWA and subsequent releases comprise the current population of California bighorn sheep on the SWA. Despite the fact that the initial release of California bighorn sheep grew in number to an estimated high of 200 in the early 1980's, the current population using the SWA is less than 50. The reduced numbers of California bighorn sheep is due, primarily, to the results of fire suppression. In the absence of the historic frequent fire regime, Douglas fir trees have become established in dense stands, and ponderosa pine have increased in density, both Douglas fir and ponderosa pine have begun invading open areas. Further

the amount, density and decadency of shrubs has increased in the absence of fire, while the quantity of forbs has decreased as well as the nutritional quality of forage. Thus the preferred habitat, the quantity and quality of forage, for bighorn sheep, have deteriorated. Additionally, the historic frequent fire regime of the SWA likely contributed to spatially decreased densities of bighorn sheep lungworm intermediate host – snails, as well as other parasites and diseases. Johnson (1983) recognized and described the importance of fire in maintaining healthy bighorn sheep habitat. Other efforts have shown a positive response of bighorn sheep to decreasing tree densities and restoring fire to their habitat (Gray 2001, Smith et. al. 1999, Wiley 2004).

The Game Management Plan Statewide Goals for bighorn sheep management calls for:

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

Objective 62 under bighorn sheep management states: “Conduct habitat improvement projects on >10% of the habitat in bighorn ranges in Vulcan Mountain, Swakane, and the Blue Mountains.”

The Strategies under Objective 62 are listed as:

- “a. Inventory and map habitat conditions.
- b. Conduct controlled burns to improve habitat quality.
- c. If not detrimental to other habitat or wildlife objectives, consider distributing fertilizer and herbicides to improve forage quality.
- d. Distribute mineral blocks to supplement forage quality.
- e. Distribute water sources to improve habitat quality.
- f. Pursue other activities that enhance desirable native plant communities.”

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

A. Strategy: Conduct, in cooperation with the Foundation for North American Wild Sheep (FNAWS), Oroville Sportsmen’s Club, and others, prescribed fuels treatment, e.g., thinning and logging on an average of 600 acres per year for 10 years to improve California bighorn sheep habitat quality. POTENTIAL FUNDING: FNAWS & Bighorn Raffle Fund Grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, USFS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application

B. Strategy: Conduct, in cooperation with the FNAWS, Oroville Sportsmen’s Club, and others, prescribed burning on an average of 1000 acres per year for a 10-year rotation to improve California bighorn sheep habitat quality. POTENTIAL FUNDING: FNAWS & Bighorn Raffle Fund 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

C. 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 California bighorn sheep

habitat, i.e., North Central Washington Prescribed Fire Council. FUNDING: Landowner assistance. TIMEFRAME: Ongoing

D. Strategy: In coordination with Area and Field Wildlife Biologists and Oroville Sportsmen's Club, select sites for installation of and install sheep "guzzlers". POTENTIAL FUNDING: FNAWS & Bighorn Raffle Fund Grants when successful, Oroville Sportsmen's Club, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., BLM, USFS, USFWS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application

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.

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 vehicle touring and viewing opportunities on the SWA as well as areas near the SWA where bighorn sheep frequent and are easily observed. POTENTIAL FUNDING: FNAWS, Oroville Sportsmen's Club, Bighorn Raffle Fund & Watchable Wildlife Grants when successful. TIMEFRAME: Ongoing grant search and application.

B. Strategy: In coordination with the effort to develop a web-cam viewing opportunity for bighorn sheep work with local businesses in Loomis, WA where a band of bighorns is frequently in the town on a daily basis in the winter and periodically during other times of the year. POTENTIAL FUNDING: FNAWS & Bighorn Raffle Fund, Oroville Sportsmen's Club, Watchable Wildlife Grants when successful. 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.

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 SWA as well as areas near the SWA where bighorn sheep frequent and are easily observed. POTENTIAL

FUNDING: FNAWS & Bighorn Raffle Fund Grants, when successful, Oroville 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 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

Mountain Goats

When the first parcels that comprise the future SWA were purchased in 1938, mountain goats were a part of the fauna inhabiting the SWA on both sides of the Sinlahekin Valley in the vicinity of Blue Lake, on the north facing cliffs and slopes of Sinlahekin Creek Canyon and on the cliffs and slopes west of the present location of the SWA Headquarters. The last known sighting of a Mountain Goat in the Sinlahekin Valley area was in 1982 on Blue Goat Mountain. For approximately 44 years mountain Goats were a part of the SWA. What happened to the Mountain Goat population is subject to speculation. The most plausible explanation is fire suppression and the resultant habitat alterations less favorable to mountain goats. It was documented that the mountain goat population was very low on Chopaka Mountain, approximately 17 miles north and 2 miles west of Blue Goat Mountain, in prior to 1929. In 1941 after an extensive fire in 1929 the mountain goat population on Chopaka Mountain had grown to nearly 250 animals (Johnson 1983). It was most likely during this time that mountain goats became established in the areas of the Sinlahekin Valley if they were not already present. Based on a diary kept by an early homesteader in the Sinlahekin Valley south of Blue Lake there were Mountain goats on Blue Goat Mountain in the late 1880's and through the 1890's (Benedict Gubser Diaries). Additionally, the historic frequent fire regime of the SWA likely contributed to spatially decreased densities of mountain goat parasites and diseases. Johnson (1983) recognized and described the importance of fire in maintaining healthy mountain goat habitat. Additionally fire has been documented as being beneficial to mountain goats by creating and maintaining a mosaic of plant communities, in particular early successional stages.

The Game Management Plan Statewide Goals for mountain goat management calls for:

- “1. Preserve, protect, perpetuate, and manage mountain goats and their habitats to ensure healthy, productive populations.
2. Manage mountain goats 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. Enhance statewide mountain goat populations and manage goats for a sustained yield.”

The Habitat Management Issue Statement under mountain goat management states: “Mountain goat populations typically occur as meta-populations scattered across the landscape on “habitat islands” where structural and vegetative characteristics are suitable for goats. The sizes and distribution of these islands of suitable habitats are largely unknown in Washington. Understanding the juxtaposition and quality of these habitats and their potential carrying capacity is critical for sustainable management of mountain goats. “

Objective 74 under Mountain Goat management states:

“Develop a document identifying the locations and quality of suitable mountain goat habitat in Washington.”

The Strategies under Objective 74 are listed as:

- “a. Map goat habitats from a review of historic distribution and local expertise of all mountain goat sub-herds.
- b. Conduct surveys to determine locations and quality of suitable goat habitats.
- c. Develop a GIS model predicting quality and locations of suitable mountain goat habitats.
- d. Develop cooperative partnerships for mapping suitable goat habitats.” (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: Assist in efforts to map historic goat distribution and habitat on and adjacent to the SWA. POTENTIAL FUNDING: Agency support, 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.

B. Strategy: Conduct, in cooperation with others, prescribed fuels treatment, e.g., thinning and helicopter logging in potential Mountain Goat habitat with an average of “TBD” acres per year for 10 years to improve Mountain Goat habitat quality. 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.

C. Strategy: Conduct, in cooperation with others, prescribed burning in potential Mountain Goat habitat with an average of “TBD” acres per year for a 10-year rotation to improve mountain goat habitat quality. 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.

D. 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 Mountain Goat habitat, i.e., North Central Washington Prescribed Fire Council. **FUNDING:** Landowner assist. **TIMEFRAME:** Ongoing

E. Strategy: Seek relocation of mountain goats to the Sinlahekin Wildlife Area. **POTENTIAL FUNDING:** Grants when successful, National Park Service, WDFW. **TIMEFRAME:** Ongoing grant search and application.

Public viewing issue statement:

“Mountain goats are intriguing to many people. However, goats are a species that occur in low densities and typically occur in areas far from human disturbances. Nonetheless, some mountain goat populations are visible from roads, but viewing opportunities are limited.”

Objective 78 under Mountain Goat management states: “Develop one viewing opportunity for mountain goats.”

The strategies under Objective 78 are listed as:

- a. Develop a web-cam viewing opportunity for mountain goats.
- b. Develop vehicle tour and education board for mountain goat viewing areas.” (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: In coordination with the effort to provide educational viewing opportunities, develop vehicle tour for mountain goat viewing opportunities, after mountain goats are re-established, on the SWA since most mountain goat habitat is visible from the county road in the SWA. **POTENTIAL FUNDING:** Watchable Wildlife & other Grants when successful. **TIMEFRAME:** Ongoing grant search and application.

Information and education issue statement:

“The public is not engaged in the recovery of declining goat populations. The public either is not aware of the status of mountain goats or lacks the necessary information to make informed decisions.”

Objective 79 under Mountain Goat management states:

“Provide educational information on mountain goats to at least 50,000 people annually.

The strategies under Objective 79 are listed as:

- a. Develop a brochure describing mountain goat ecology and history of Washington’s populations and their locations.
- b. Develop an educational viewing opportunity and information website.
- c. Discuss management of mountain goats 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 SWA as well as areas near the SWA where mountain goats, after re-establishment on the SWA, frequent and are easily observed. **POTENTIAL FUNDING:** Watchable Wildlife & other Grants when successful. **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 mountain goats were historically and where and active re-establishment program is ongoing and goats would be readily visible. POTENTIAL FUNDING: Watchable Wildlife & other Grants when successful. TIMEFRAME: Ongoing grant search and application.

Moose

Since 1998 the steady number of observations and reports of moose and moose sign on or adjacent to the SWA indicate a stable and possibly increasing number of moose.

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.

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

Black Bear

Black bear are present on and adjacent to the SWA in good numbers. Some visitors to the SWA specifically come to watch black bear on the steep slopes east of Forde Lake in the Spring and Fall. Additionally black bears are an attraction that visitors can occasionally see when camping, hiking or driving through the SWA. Hunters come to the SWA specifically to hunt black bear.

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 SWA. POTENTIAL FUNDING: Agency Support (Federal Aid).
TIMEFRAME: Ongoing

Cougar

The SWA hosts a number of cougars with the cliffs and rocky broken terrain being a favored habitat providing hunting and escape cover. Being very cryptic, cougars are not a common sight in the SWA, but their numbers and presence are apparent as evidenced

by tracks after a snowfall in the winter. The SWA is a favorite cougar hunting area for boot hunters after a fresh snowfall. Visitors to the SWA who do get an occasional observation of a cougar are quick to share their observations.

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

1. Preserve, protect, perpetuate, and manage cougar and their habitats to ensure healthy, productive populations.
2. Minimize threats to public safety and private property from cougars.
3. Manage cougar 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 cougar populations for a sustained yield.“

Habitat Management Issue Statement:

“The density of cougars is not uniform across the landscape. Cougar densities likely vary based on prey abundance, vegetation conditions, human disturbances, and other factors that influence cougar habitat. To properly manage cougar populations (e.g., harvest, public safety), it’s important to identify core and peripheral habitats so management decisions can be adjusted accordingly.”

Objective 106 under cougar management states:

“Develop a map identifying core habitat areas for cougar.”

The strategies under Objective 106 are listed as:

- a. Conduct literature review on cougar habitat requirements.
 - b. Identify distributions of important prey species.
 - c. Develop a model identifying relative habitat suitability for cougar.
 - d. Incorporate data from past and current studies.
 - e. Identify habitats secured for prey species that also benefit cougar populations.”
- (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: Assist in efforts to identify habitats secured for prey species that also benefit cougar populations as related to the SWA. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing

2. Manage for waterfowl

Having 11 lakes, ponds and impoundments as well as over 10.5 miles of streams the SWA provides wintering, foraging, brood rearing, migration and breeding habitat for at least 22 species of waterfowl including hunted and protected species. The SWA is not a large draw for waterfowl hunting, but there are a few hunters who use the techniques known as “jump shooting” and “pass shooting” of waterfowl. Historically “goose tubs and wood duck nest boxes have been installed to enhance nesting habitat for Canada geese and cavity nesting ducks.

However, there are a growing number of birders that have discovered the waterfowl viewing opportunities on the SWA.

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 SWA.

POTENTIAL FUNDING: Grants when successful, WDFW, Ducks Unlimited, Oroville Sportsmen’s Club. **TIMEFRAME:** Ongoing grant search and application.

B. Strategy: Install and maintain existing “goose” tubs and wood duck nest boxes. **FUNDING:** Nest Structures (Federal Aid). **TIMEFRAME:** Annual Ongoing.

3. Manage for migratory upland game birds

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

Mourning doves, coot and snipe use the SWA for nesting and brood rearing. Snipe use the SWA year round whereas mourning doves and coots are present during spring summer and fall. However, a small number of mourning doves have been present on the SWA on a year round basis. Band-tailed pigeons are present on the SWA only rarely.

Mourning dove hunting is not a big draw to the SWA, 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, coots, and snipe habitat status on the SWA. 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).

A. Strategy: Assist in efforts to determine mourning doves, coots, and snipe habitat protection and enhancement needs on the SWA. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

B. Strategy: Provide opportunities for mourning doves, coots and snipe habitat projects on the SWA. 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).

A. 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 SWA website. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

B. Strategy: Assist in developing materials describing hunting opportunities for mourning doves, coots and snipe on the SWA. POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

4. Manage for wild turkey

Releases of wild turkeys have been made on the SWA at least 3 times over the last 20 years, but the wild turkey population does not expand on the SWA. With the paucity of turkeys, turkey hunting on the SWA is popular only with a few hunters during the early part of the season.

The Game Management Plan Statewide Goals for wild turkeys call for:

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

2. Manage wild turkeys 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 wild turkey populations for a sustained harvest.” (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: Assist in the transfer of information about wild turkeys and their management by posting information or adding a link to the SWA website.

FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

B. Strategy: Assist in developing materials describing hunting and non-hunting opportunities for wild turkeys on the SWA. FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

5. Manage for forest grouse

Two species of forest grouse are found in abundance on the SWA with ruffed grouse being of particularly high density in portions of the SWA. Forest grouse hunting on the SWA is a popular activity throughout September and early October.

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 SWA for application on other forestlands. POTENTIAL FUNDING: Agency Support, Grants when successful, Ruffed Grouse Society, graduate students, interns, qualified volunteers. TIMEFRAME: Ongoing grant search and application.

B. Strategy: Experiment with prescribed burning to increase habitat diversity by encouraging early successional vegetation patches in riparian areas on SWA. 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

The SWA was purchased to provide habitat for upland game birds and mule deer. Upland game birds present on the SWA include Ring-necked pheasant, Hungarian partridge, California quail and chukar partridge. There are no releases of game farm

birds on the SWA; all birds are wild reared birds. Upland birds provide recreational opportunities.

Upland game birds found on SWA include Hungarian partridge, ring-necked pheasant, California quail, and chukar partridge. All of these species on SWA are the progeny of released birds, however there are presently no birds being released on SWA and there are no plans for future releases. The SWA is a popular destination for upland bird hunters who prefer hunting wild bred upland birds.

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 SWA. POTENTIAL FUNDING: Agency Support (Federal Aid).

TIMEFRAME: Ongoing.

B. Strategy: Seek funding for upland bird habitat enhancement on the SWA.

POTENTIAL FUNDING: Grants when successful. TIMEFRAME: Ongoing grant search and application

C. Strategy: Maintain springs and guzzlers to provide water for upland birds and other species. Repair and maintain 6 existing upland game bird guzzlers. Develop new water sources in areas identified with the Area and Field Wildlife Biologists and install new springs and guzzlers.

POTENTIAL FUNDING: Agency Support (Federal Aid), Grants when successful, volunteers, students, interns, assistance from other organizations, i.e., Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

D. Strategy: Maintain small grain food plots to provide concentrated food sources for upland game birds. Continue to provide standing grain food plots for upland game bird feed on SWA. FUNDING: Maintain Forage (Federal Aid).

TIMEFRAME: Annually, Mar – Oct.

E. Strategy: Maintain upland birds feeders throughout the winter. Continue to maintain and fill a minimum of 15 upland game bird feeders on SWA. FUNDING: Winter Feeding (Federal Aid). TIMEFRAME: Annually, Dec – Mar.

F. Strategy: See also Agency Objective: Protect, Restore & Enhance Fish and Wildlife and Their Habitats. Sub-objective 11.

G. Strategy: Use prescribed burning to provide a mosaic of habitat types from early successional types to late successional types to benefit upland game birds.

POTENTIAL FUNDING: Grants when successful, qualified volunteer, Assistance from other Agencies, e.g., USFS, DNR, USWFS. TIMEFRAME: Ongoing grant search and application.

Issue Statement:

“Some upland game birds exist in areas where sharp-tailed grouse and sage grouse can be found. Concerns over misidentification of game birds have been expressed and it is important that hunters know the differences between upland game birds and non-game upland wildlife.”

Objective 158 under upland game bird management states:

“Provide educational materials to hunters that describe the differences between upland game species and non-game upland birds.”

The strategies under Objective 158 are listed as:

a. Include information describing the differences between pheasants and sharp-tailed grouse and sage grouse and include it in the annual upland bird hunting pamphlet.
b. Post signs notifying hunters of sage or sharp-tailed grouse being present in areas where upland game bird hunting occurs.” (Washington Department of Fish and Wildlife Game Management Plan. 2003)

A. Strategy: Assist in development and distribution of informational brochures informing hunters of the possibility of Sharp-tailed grouse on the SWA.

POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

B. Strategy: Post signs alerting hunters to the possibility of Sharp-tailed grouse being present on the SWA. **FUNDING:** Signs (Federal Aid). **TIMEFRAME:** Ongoing.

7. Manage for small game, furbearers, and unclassified species

There are many small game, furbearers and unclassified species on the SWA including bobcats, coyotes, muskrats, beaver, mink, long-tailed weasel, river otter, etc. Coyote hunting is a popular activity on the SWA. Limited trapping occurs for bobcat on the SWA, but there is opportunity for trapping of other furbearers on the SWA. All of these species also 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 under 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 SWA. **POTENTIAL FUNDING:** Agency Support (Federal Aid). **TIMEFRAME:** Ongoing.

B. Strategy: Provide viewing opportunity of the small game, furbearer and Unclassified wildlife. **POTENTIAL FUNDING:** Watchable wildlife and other grants when successful. **TIMEFRAME:** Ongoing grant search and application.

8. Improve and maintain fish populations

In 1949-50 portions of Sinlahekin Creek and Coulee Creek on the SWA were modified to create new impoundments where none existed or enlarge lakes that already existed.

These impoundments have been used as destination fishing sites by fisherpersons from all over Washington State as well as areas outside of Washington State. At one time Blue Lake was used as a westslope cutthroat broodstock lake. Presently there are 15 species of

fish in the waters of the SWA and potentially more native nongame fishes. ([APPENDIX 6](#)). With the exception of fish passage barrier removal, there is little that can be improved on in terms of enhancing or maintaining fish populations on the SWA. Maintenance of what exists would be the primary objective, however the SSHEAR Section of the Environmental Restoration Division of the Habitat Program has identified the current dams as part of a fish barrier problem. This issue is being debated and alternatives to provide fish passage are being considered and discussed. It is assumed that other aquatic life will benefit from managing for suitable conditions for the species currently present.

A. Strategy: In areas subject to grazing by domestic stock, permitted or trespass, fence riparian habitat along Sinlahekin Creek, Coulee Creek and all impoundments to protect from unmanaged grazing impacts. FUNDING: WHIP, other grants sources and Fences (Federal Aid) TIMEFRAME: Ongoing and grant search and application

B. Strategy: Request work with the SSHEAR Section to address fish passage barrier issues. FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

C. Strategy: When requested, work with Area Fish Biologist to identify habitat improvement or maintenance activities that would benefit fish on the SWA.

POTENTIAL FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing

D. Strategy: Maintain current habitat conditions to sustain existing game fish populations to provide fishing opportunities, i.e., continue to operate water control structures to provide habitat. FUNDING: Lakes, Ponds & Streams (Federal Aid). TIMEFRAME: March – June, as needed annually.

E. Strategy: Work with Area Fish Biologist to limit stocking of waters with non-native species except in those cases where non-native fish cannot escape into surrounding waters. FUNDING: Agency Support (Federal Aid). TIMEFRAME: Ongoing.

9. Manage for species diversity

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 have been created for the SWA [APPENDIX 6](#). These lists include species known to occur on the SWA as well as species that may occur, but have not been verified. Anecdotal presence/absence surveys have been ongoing on the SWA 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. Fire suppression has reduced the habitat diversity needed to sustain high species diversity. Nearly all activities on the wildlife area 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: Obtain funding to conduct extensive inventories of small mammals, birds, herptiles, fishes, mollusks, lichens, mosses, Odonata and butterflies prior to fuels treatment and prescribed burning. 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: Develop GIS layers depicting distribution of species on the SWA. 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: Assess timber-thinning project to reduce potential insect and catastrophic fire danger and create forest conditions more suitable to a diversity of species. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, interns, assistance from other agencies, i.e., USFS, BLM, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

E. Strategy: Conduct prescribed fuels treatment, e.g., thinning and logging on an average of 600 acres per year for 10 years in preparation to re-introduce fire back into the ecosystem to restore the ecological processes that fire initiates which result in habitat diversity that supports species diversity. 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.

F. Strategy: Conduct prescribed burning on an average of 1000 acres per year for a 10-year rotation to improve habitat diversity and quality. 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 area plant communities and associations provide for the greatest 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, composition, structure and reduced the mosaic effect that contributes to increased diversity necessary for sustaining a variety of species.

A. Strategy: See also Agency Objective: Influence the decisions of others that affect fish, wildlife and their habitats. Sub-objective 8.

B. Strategy: Plant Water Birch along Coulee Creek in Doheny Basin riparian area to enhance Sharp-tailed grouse winter forage. (In progress). FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application (Current WHIP grant work, i.e., fencing and tree planting, to be completed 2006).

C. Strategy: Work with Area and Field Wildlife Biologists to identify riparian areas for additional restoration or protection. POTENTIAL FUNDING: assistance from other WDFW personnel. TIMEFRAME: Ongoing.

D. 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, volunteers, students, interns, assistance from other agencies, i.e., USFS, BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application

E. Strategy: Fence springs and riparian areas from overuse by permitted and trespass livestock. POTENTIAL FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., BLM, NRCS, 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. Shrub-steppe on the SWA is being converted to predominantly shrub with encroaching ponderosa pine and Douglas fir stands due to fire exclusion.

A. Strategy: Using historical aerial photos develop a map of historic shrub-steppe habitats and determine the number of acres converted to shrub and forest encroachment. POTENTIAL FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

B. Strategy: Perform shrub steppe condition surveys to assess habitat quality issues. POTENTIAL FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application

C. Strategy: Restore old agriculture fields to native shrub steppe habitat. Utilize CPR funding if possible. POTENTIAL FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

D. Strategy: Conduct prescribed fuels treatment, e.g., thinning and logging to restore shrub-steppe on an average of TBD acres per year for 10 years in preparation to re-introduce fire back into the ecosystem to restore the ecological processes fire initiates that results in the habitat diversity which supports a high diversity of species. POTENTIAL FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

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

F. Strategy: Convert fields of non-native vegetation to native shrub-steppe including grasses, forbs and shrubs, e.g., pure stands of sheep fescue need to sprayed, worked up and reseeded to native vegetation. POTENTIAL FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

G. Strategy: Inventory and develop GIS layers depicting fields of non-native vegetation with accompanying acreage and type of non-native vegetation in each field. POTENTIAL FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

H. Strategy: Convert present food plots/agricultural fields that are impractical to maintain due to size or sandy soils to native shrub-steppe vegetation. POTENTIAL FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

I. Strategy: Collect seeds of native plant species on the SWA and have them commercially grown to provide larger quantities for shrub-steppe restoration purposes. POTENTIAL FUNDING: Grants when successful, volunteers, students, interns, assistance from other agencies, i.e., BLM, NRCS, 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. *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. 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: Federal Aid – forage, 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 conditions in which indigenous fauna and flora evolved. By assuring that fire will continue to be a part of the ecosystem as it historically was for thousands of years until about 100 years ago, the 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. Sharp-tailed grouse, a State Threatened species* and a Federal Species of Concern*, were regularly present in certain areas of the SWA prior to 1983 and thereafter observed intermittently. The area where they once were is successionaly converting from shrub-steppe to ponderosa pine and Douglas fir forest.

***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 is a law that was enacted in 1973 for this purpose:

- 1. To identify animals and plants that are in trouble.**
- 2. To protect those 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: Specifically, in the areas where Sharp-tailed grouse use to occur, conduct fuels treatment and prescribed burning to restore shrub-steppe habitat.

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: Work with Area and Field Wildlife Biologists and Area Fish Biologist determine what species may be of special significance and develop management plans to address them.

POTENTIAL FUNDING: Assistance from other WDFW personnel. **TIMEFRAME:** Ongoing

C. 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.

D. Strategy: Conduct prescribed fuels treatment, e.g., thinning and logging on an average of 600 acres per year for 10 years in preparation to re-introduce fire back into the ecosystem to restore the ecological processes that fire initiates which result in the habitat diversity that supports a maximal number of species.

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.

E. Strategy: Conduct prescribed burning on an average of 1000 acres per year for a 10-year rotation to improve habitat diversity and quality. 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.

14. Protect, restore and maintain ecosystem functions and processes

Historic ecosystem functions and processes, e.g., fire and flooding, have been impacted, e.g., fire suppression, creation of impoundments, on the SWA and thus impacted flora and fauna. In some instances the impacts have been beneficial to species and in other cases the impacts have been negative. For thousands of years these processes acted in concert with succession, herbivory and climate to create conditions that sustained the historic plant communities, hydrology and the fish and wildlife dependent thereon. In particular unmitigated fire suppression and resultant fire exclusion has had profound impacts on the plant communities, wildlife habitat and landscape hydrology. As a result of fire suppression plants and plant communities have become dysfunctional and conditions have been created that will result in extremely severe fires.

A. Strategy: Conduct prescribed fuels treatment, e.g., thinning and logging on an average of 600 acres per year for 10 years in preparation to re-introduce fire back into the ecosystem to restore the ecological processes that fire initiates which result in the habitat diversity that supports a maximal number of species. 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: Conduct prescribed burning on an average of 1400 acres per year for a 10-year rotation to improve habitat diversity and quality. 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: Work with private, county, state and federal land managers to promote use of prescribed fire, in a coordinated effort on all lands, to reintroduce fire to the fire-deprived fire-dependent ecosystem, i.e., North Central Washington Prescribed Fire Council. FUNDING: Landowner assistance. TIMEFRAME: Ongoing

15. 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 SWA, 2) what their habitat requirements are, 3) a complete soil survey of the SWA.

A. Strategy: 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, students, interns, assistance from other agencies, i.e., USFS, USFWS, 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, students, interns, assistance from other agencies, i.e., USFS, USFWS, 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, students, interns, assistance from other agencies, i.e., USFS, USFWS, BLM, NRCS, assistance from other WDFW personnel. TIMEFRAME: Ongoing grant search and application.

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

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

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 SWA that will increase knowledge about the SWA and contribute to management of the SWA. 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 program. WDFW can lead the way in this endeavor. While at the same time maintaining healthy fish and wildlife populations and habitat and providing diverse, high quality recreational and commercial opportunities. 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 SWA 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. 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. 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

2. Develop vision and plans for a Sinlahekin Tech-transfer/Interpretive/Visitors/Education and Research (STIVER) Center

The SWA is a destination, NOT a roadside attraction, for thousands of visitors including hunters, fisherpersons, campers, bird watchers, wild flower and butterfly enthusiasts, hikers, horseback riders, sightseers, auto tourists, etc. Additionally the uniqueness of the SWA in terms of history, diversity of plant species, wildlife species, plant communities, elevation, topography, soils, scenery and geology provides opportunity to educate the general public about the rich diversity of the area, the dynamic processes, e.g., interactions of disturbance regimes, wildlife species, plant communities, soil and climate, of ecosystems and how they provide the historic and contemporary habitat components that support wildlife species diversity. Further benefits from such a facility would include a resource for local and regional schools, colleges and universities to use for environmental, ecological educational and natural resource management education purposes as well as a base for conducting research on fish and wildlife species, their habitats, historic and contemporary disturbance regimes, development and refinement of management strategies that will sustain or increase diversity and ecosystem function. Finally a STIVER Center would contribute to the local economy of Loomis, the local area and the region.

A. Strategy: Work with local and regional leaders, local and regional school districts, colleges and universities, local and regional communities, local and regional tourism councils, local businesses and the Colville Tribes to gain support and funding for a Sinlahekin Tech-transfer/Interpretive/visitors/education and research center. **POTENTIAL FUNDING:** Grants when successful, assistance from other agencies and organizations. **TIMEFRAME:** Ongoing support search, grant search and application.

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 protection and habitat management.

Access for hunting, fishing, wildlife viewing and other activities is an agency priority. However, access and recreation must be managed 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: See also Agency Objective: Influence the decisions of others that affect fish, wildlife and their habitats. Sub-objective 2.

B. Strategy: Provide open roads where no resource issues exist and when there are sufficient resources to maintain them. Address requirements in Road Management and Abandonment Plans (RMAP). **FUNDING:** Grants when successful, assistance from other agencies, i.e., Okanogan County, DNR, assistance from other WDFW personnel, e.g., construction shop. **TIMEFRAME:** Ongoing, ongoing grant search and application.

C. Strategy: Close road access where road conditions are not safe or where conditions have a significant negative impact on fish and wildlife. **FUNDING:** Signs, RMAP, grants when successful, assistance from other agencies, i.e., Okanogan County, DNR, assistance from other WDFW personnel, e.g., construction shop. **TIMEFRAME:** Ongoing, ongoing grant search and application.

D. Strategy: Sign all SWA entry roads with rules on road use and vehicle use and sign all roads with limited access. **FUNDING:** Signs, grants when successful, assistance from other WDFW personnel, e.g., WCC. **TIMEFRAME:** Ongoing grant search and application.

E. Strategy: Sign all entry roads with rules on use and recreational use on the SWA. **POTENTIAL FUNDING:** Signs, grants when successful, volunteers, students, interns, assistance from other WDFW personnel, e.g. WCC. **TIMEFRAME:** Ongoing grant search and application

F. Strategy: Provide camping opportunity in all existing camping areas where no resource issues exist. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, interns, assistance from other agencies, other organizations assistance from other WDFW personnel. **TIMEFRAME:** Ongoing grant search and application.

G. Strategy: Work with Access Area Maintenance to provide “Designated” campsites to reduce camping outside of normal camping areas. **FUNDING:** Campsites, grants when successful, qualified volunteers, interns, assistance from other agencies and other organizations assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

H. Strategy: Provide fishing and wildlife viewing opportunities for persons with disabilities. **FUNDING:** Grants when successful, qualified volunteers, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing (Conner to Forde Lake Trail and Forde lake to Blue Lake Trail Grants from IAC), ongoing grant search and application

I. Strategy: Provide trails for hunting, fishing, hiking, walking, horseback riding, bird watching, wildflower viewing, butterfly watching, interpretive and sightseeing opportunities. **FUNDING:** Grants when successful, qualified volunteers, interns, assistance from other agencies and other organizations assistance from other WDFW personnel. **TIMEFRAME:** Ongoing (Conner to Forde Lake Trail and Forde lake to Blue Lake Trail Grants from IAC),, ongoing grant search and application.

J. Strategy: Provide self guided interpretive tours, including kiosks, reader boards, pamphlets and brochures, on the SWA 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. **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.

K. Strategy: Develop maps, brochures and pamphlets of the SWA for issuance to the public. **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.

L. Strategy: Develop a GIS layer depicting all roads, on the SWA indicating their ownership, 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

M. Strategy: Develop a GIS layer depicting all trails on the SWA 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.

N. Strategy: Develop GIS layer(s) depicting all campgrounds with facilities, toilets, fire pits, 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.

O. Strategy: Develop ADA and non-ADA trails and facilities to enhance fish and wildlife recreational opportunities. FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies and other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing (Conner to Forde Lake Trail and Forde lake to Blue Lake Trail Grants from IAC), ongoing grant search and application.

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

A. Strategy: Use proven contractors to implement fuels treatment prescriptions, e.g., thinning, logging. 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: Use proven contractors to implement prescribed burns. POTENTIAL FUNDING: Grants when successful, qualified volunteers, assistance from other agencies, i.e., USFS, BLM, USFWS and other organizations, assistance from other qualified WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

C. Strategy: Use proven contractors to develop silvicultural prescription plans, fuels treatment prescription plans and prescribed burning plans. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, 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.

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 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 participation in Okanogan County Coordinated Weed Management Area (OC CWMA), 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 SWA - 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 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, Advanced Hunter Education Candidates. 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.**

H. Strategy: Continue to seek funding to assure a 9-month FTE dedicated to weed control on the SWA, DIWA 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 grid for and 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, and 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 SWA 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 and fish passage structures 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: Complete a forest Road Management and Abandonment Plan. TIMEFRAME: **Completed most recently.**

E. Strategy: Work with SSHEAR Section to correct known fish passage barriers to allow fish movement. 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: Develop fuels treatment, e.g., logging and thinning prescriptions and 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.

G. 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 SWA to ensure continued habitat dynamics associated with fire and maintenance 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 SWA. 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. FUNDING: State Wildlife Account. TIMEFRAME: Ongoing

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.

D. 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.

E. Strategy: Develop protocol and mechanisms necessary to conduct and/or contract for prescribed burning to reduce time and effort spent in unnecessary bureaucratic exercises. 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 SWA. 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.

D. Strategy: Map all cultural resources on the SWA 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., 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.

E. Strategy: Assess cultural resources for wildlife values, i.e., bats, Vaux's swifts, for wildlife values before renovation or removal. FUNDING: Federal Aid
TIMEFRAME: 2006 **Completed**

F. Strategy: Work with Okanogan County Historical Society and others to develop plans and obtain funding for cultural resources to be preserved and protected. FUNDING: Federal Aid. TIMEFRAME: 2007. 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 SWA 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: Maintain office to provide a safe, efficient and effective workplace. Provide utilities, phone, computers, etc. **FUNDING:** Federal Aid, State Wildlife Account, Game Fund, Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., NRCS, BLM, other organizations, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

B. Strategy: Obtain funding to get all boundary lines of the SWA surveyed, marked and/or fenced. **NOTE:** The property boundary line between WDFW & USFS have been surveyed and marked as of 2001. **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.

C. Strategy: Collect GPS data and develop GIS data layers for all facilities and features including fences, gates, buildings, water control structures, guzzlers, photo points, old garbage dumps, signs, cultural resources, springs, watering troughs, cattleguards, water pumps, wells, etc. **POTENTIAL 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.

D. Strategy: Develop a monthly, quarterly, semi-annual, annual or biennial routine maintenance schedule for fences, signs, water control structures, buildings, guzzlers, watering troughs, cattle guards, etc. **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.

E. Strategy: Maintain all fences to prevent trespass livestock and to keep permitted livestock where they are suppose to be, thereby precluding unplanned habitat disturbances. **POTENTIAL FUNDING:** Grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., NRCS, BLM, USFS, grazing permittees, other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. **TIMEFRAME:** Ongoing, ongoing grant search and application.

F. 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.

G. Strategy: Remove all old garbage dumps and scrap metal piles on the SWA. **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.

H. Strategy: Maintain roads to prevent resource damage and provide access. Forde Lake, Conner Lake and Zachman Roads need to be filled with good ballast using 3.5” minus crushed rock, packed, topped with gravel and graded. 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.

I. Strategy: Work with Access Maintenance to maintain campgrounds and parking areas to prevent resource damage and provide access. Barriers need to be placed in camping areas to limit access by vehicles to wildlife trees and riparian habitat. Sign all campgrounds and parking lots. 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

J. Strategy: Using the SWA 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. 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

K. Strategy: Negotiate a new agreement and/or renegotiate the agreement with DNR for use of the Fire Camp to provide tangible and real benefits to the SWA, WDFW, the wildlife resource and the public. FUNDING: Federal Aid, Assistance from other WDFW personnel. TIMEFRAME: Every 5 years.

L. Strategy: Construct/add on a bathroom with toilet shower facility and water heater to the machine shop. POTENTIAL FUNDING: Capitol projects. TIMEFRAME: As soon as possible.

M. Strategy: Identify and explain other capital needs. 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 bridges, gates, culverts, water control structures, wells, irrigation systems to perform operation and maintenance of area. 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 and grants when successful, qualified volunteers, students, interns, assistance from other agencies, i.e., USFS, BLM, DNR, other organizations Oroville 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 and 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 and 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., Mule Deer Foundation; Foundation for North American Wild Sheep (FNAWS); NRCS – WHIP, CRMP, CCRMP, etc.; National Fire Plan; WDFW Bighorn Sheep funds.

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 and 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 and 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 weed controlled. FUNDING: Federal Aid, State Wildlife Account and qualified volunteers, assistance from other agencies, i.e., NRCS, BLM, assistance from other WDFW personnel. TIMEFRAME: Ongoing

E. Strategy: Use “goods-for-services” contracts to implement and complete fuels treatments, e.g., thinning and logging. FUNDING: Federal Aid, State Wildlife Account, Grants when successful, qualified volunteers, assistance from other agencies, i.e., NRCS, BLM, USFS, DNR other organizations, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

F. 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.

G. 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.

H. 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.

I. Strategy: Seek out and develop partnerships with National, Regional and local sports groups, e.g., Washington State Bow Hunters, Inland Empire Wildlife Council, Oroville 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 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

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.

A. Strategy: Conduct a comprehensive fire history analysis of the SWA 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 SWA 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: Conduct a Historic timber stand analysis on the SWA with a report detailing the composition and structure of historic timber stands. This will provide a clearer picture and better understanding of what the historic stands looked like and provide better information to incorporate in managing the forest component on the SWA. 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.

C. Strategy: Determine and develop GIS layers, from historic aerial photos and historic timber stand analysis the amount of Shrub-steppe habitat type that has been invaded and encroached by ponderosas pine and Douglas fir. 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.

D. Strategy: Develop plans to address “restoration” of the fire-dependent ecosystem on the SWA 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.

E. Strategy: Assess timber-thinning project to reduce potential insect and fire danger and create forest conditions more suitable to a diversity of species. POTENTIAL FUNDING: Grants when successful, qualified volunteers, graduate students, students, interns, assistance from other agencies, i.e., NRCS, BLM, USFS, USGS, other organizations Oroville Sports Club, Okanogan Wildlife Council, assistance from other WDFW personnel. TIMEFRAME: Ongoing, ongoing grant search and application.

F. Strategy: Develop plans to address “restoration” of the flood plain functions on the SWA 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., EOC CAG, 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 SWA or adjacent lands that could impact management on the SWA. 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

O. Strategy: Conduct stewardship inspection of Greg and Carol James' Conservation Easement. 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

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/unused 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 SWA could be enhanced regarding fish and wildlife habitat management by providing onsite interpretive trails, signs and an interpretive center. When people visit the SWA they may have questions about why certain things are being done or about the fish and wildlife and habitats on the SWA. 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: See also Agency Objective: Provide Sustainable Fish and Wildlife-Related Recreational and Commercial Opportunities Compatible With Maintaining Healthy Fish and Wildlife Populations and Habitats. Improve the Economic Well-Being of Washington by Providing Diverse, High Quality Recreational and Commercial Opportunities. Sub-objective 2.

B. Strategy: See also 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. Sub-object 1.

C. 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 SWA 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

D. Strategy: Develop programs and opportunities for college interns and other volunteers to work on the SWA. 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

E. Strategy: Develop educational opportunities for local K-12 students and classes to be involved in projects on the SWA. 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.

F. Strategy: Develop opportunities for teachers and instructors to bring students, learning groups and others to visit the SWA 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.

G. 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, EVALUATION AND UPDATES TO THE SWA WILDLIFE AREA PLAN

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

1. The SWA performance measures for 2006 include:

- Meet requirements of Federal Aid contract
- Renew grazing leases and agricultural leases expiring on or before December 31, 2006.
- Complete Fire Regime Condition Classification mapping
- In coordination with Lands program staff, negotiate new agreement with DNR for use of the Highlands Fire Camp Site
- Prepare and implement a fuels treatment project in area logged winter of 2003-04 in preparation for coordinated fuels treatment and Rx burn with USFS
- Survey and/or mark/sign a minimum of 10 miles of SWA boundary
- Build, rebuild or repair a minimum of 10 miles of fence
- Initiate and complete as much as possible the Connors Lake to Forde Lake and Forde Lake to Blue Lake trails development projects
- Develop protocol and procedures to facilitate implementation of prescribed burns
- Apply for at least one grant through FNAWS, Mule Deer Foundation for habitat assessment and enhancement work.
- Complete installation of reader boards at all 7 entrances to the SWA
- Map with GPS and GIS all weed infestations on the SWA, such that a layer depicting a map of each weed species is included in the SWA GIS project
- Grid, GPS and map Dalmatian Toadflax, Russian knapweed, and other weeds
- Initiate and complete WHIP grant project for Doheny Basin riparian protection and Water birch planting to provide Sharp-tailed grouse winter forage
- Complete and/or review and update plans including WA plan, weed plan, and fire management plan
- Complete performance evaluations
- Complete layers on SWA GIS project including Fence, Fence features, artificial nest structures, roads, culverts, campsites, toilets, signs, reader boards, power poles
- Visit all known Dalmatian Toadflax and Russian knapweed sites at least twice and initiate appropriate treatment
- Do Stewardship inspection of Greg and Carol James' Conservation Easement
- Initiate and complete Mule Deer Foundation grant for mule deer habitat enhancement
- Complete National Fire Management Plan grant from USFWS for Sinlahekin Fuels Management and Planning
- Initiate and complete self guided tour project
- Complete projects for which grants were awarded
- 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
- Use Okanogan County Jail Trustees for weed control and fence maintenance efforts

- Work with private, county, state and federal land managers to promote use of prescribed fire, in a coordinated effort on all lands, to improve wildlife habitat, i.e., North Central Washington Prescribed Fire Council
- Apply for grants and other funding opportunities consistent with planned priorities to supplement funding

2. Annual Evaluation of Performance.

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

3. Annual Plan Update.

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

APPENDIX 1. Public Issues

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

Sinlahekin Wildlife Area

March 9, 2005

The purpose of meeting with the EOC CAG and OODT was to obtain input to help guide management actions on the Sinlahekin Wildlife Area. A draft of the introduction and history of the wildlife area and copies of the Agency's goals and objectives were distributed for review and discussion. Below is a list of issues and concerns identified by the EOC CAG and OODT. These issues were categorized. Issues specific to a particular Wildlife Area were deleted from the list for areas they did not apply. Issues related to Wildlife Areas outside of the East Okanogan 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 OODT. 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.
- Pullouts along roads in Wildlife areas.
- 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 take 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.
- 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.
- Timber management – fuels management and prescribed (Rx) burning Income can help program.
- Specify what habitat objectives are in plan.
- Water rights – keep them up-to-date so don't lose them.
- Local concern for numbers of White-Tailed deer on the Sinlahekin – not enough W-T deer. General feeling that a long season results in W-T being run out of country and onto private ground. Long time bow hunting camps will be moving out of Sinlahekin if things don't improve next hunting season (2005).
- Consider all species of grouse in management plans.
- Need augmentation of indigenous S-T grouse populations with birds from other areas.
- 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 lands 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.
- Improve and manage wildlife viewing opportunities in a manner that is not detrimental to the wildlife resource.
- Actively manage to improve Bighorn sheep habitat in the Sinlahekin Wildlife Area.
- 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

- Aspen stands need regeneration/restoration by logging, fire and other disturbances.
- 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.
- Reintroduction of fire to Driscoll Island was a good idea. 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.
- 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.

- Concern for keeping disturbance out of parcels permanently, i.e., fencing out riparian area and not grazing or burning it.
- 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.
- Grazing – restore economically and environmentally sustainable grazing using grazing plans, fencing, water, supplements, etc.
- Grazing management techniques, i.e., fall trees over streams to make access to riparian areas difficult vs. fencing out riparian areas.

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

- Develop Informational fliers and have available at local businesses, agency offices or reader boards.
- Wildlife Areas can be an educational opportunity to all levels of education.
- More signs – interpretive signs, e.g., wildlife to see, explaining management activities.
- 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.

- Need to get the Sinlahekin map produced and distributed.

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. Sinlahekin 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-Designate, and county listed weeds).

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

Weed Management Approach

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

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

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.
- Minimize risk of new weed infestations by encouraging “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 and local 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 SWA 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 Sinlahekin Wildlife Area:

Approximately 113 species of exotic or non-indigenous vascular plants occur on the Sinlahekin Wildlife Area. Of these 19 species are classified as weed species by Washington State and/or Okanogan County Weed Board. These 19 species include 8 Class B weeds, 8 Class C weeds and 3 species to Monitor. Additionally exotic species exist on the SWA that are not Classified as weed species by the State or County, however, based on observations of the current SWA manager these species warrant eradication and/or control due to their demonstrated ability to spread.

State Class B Weeds present on the SWA include: Dalmatian toadflax (*Linaria dalmatica ssp. dalmatica*), watermilfoil (*Myriophyllum spicatum*), Herb-Robert or Robert geranium (*Geranium robertianum*), Hoary alyssum (*Berteroa incana*), common houndstongue (*Cynoglossum officinale*), kochia (*Kochia scoparia*), perennial sowthistle (*Sonchus arvensis*), Purple Loosestrife (*Lythrum salicaria*), Russian knapweed (*Acroptilon repens*), Tamarisk (*Tamarix spp.*).

State Class B – Designate (Bd) Weeds present on the SWA include: Hoary alyssum (*Berteroa incana*), Herb-Robert or Robert geranium (*Geranium robertianum*), Dalmatian toadflax (*Linaria dalmatica ssp. dalmatica*), Purple Loosestrife (*Lythrum salicaria*), perennial sowthistle (*Sonchus arvensis*), Tamarisk (*Tamarix spp.*).

State Class C Weeds present on the SWA include: black henbane (*Hyoscyamus niger*), whitetop or hoary cress (*Cardaria draba*), Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), field morning-glory (*Convolvulus arvensis*), dodder (*Cuscuta approximata*), baby's breath

(*Gypsophila paniculata*), St. John's-wort (*Hypericum perforatum*), yellow iris (*Iris pseudacorus*), white campion or white cockle (*Lychnis alba* aka *Silene alba*), and reed canarygrass (*Phalaris arundinacea*).

State Monitor List Weeds present on the SWA include: silvery cinquefoil (*Potentilla argentea*), watercress (*Rorippa nasturtium-aquaticum*), and common mullein (*Verbascum thapsus*).

County Class B – Designate (Bd) Weeds present on the SWA include: Hoary alyssum (*Berteroa incana*), Dalmatian toadflax (*Linaria dalmatica ssp. dalmatica*).

County Class B & C - Reduction (B&Cr) Weeds present on the SWA include: whitetop or hoary cress (*Cardaria draba*), diffuse knapweed (*Centaurea diffusa*), Russian knapweed (*Acroptilon repens*), common houndstongue (*Cynoglossum officinale*), and perennial sowthistle (*Sonchus arvensis*).

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

SWA Manager designated vascular plant species for eradication includes: Russian olive (*Elaeagnus angustifolia*), common bladder senna (*Colutea arborescens*), sheep sorrel (*Rumex acetosella*), tartarian honeysuckle (*Lonicera tartarica*), common burdock (*Arctium minus*) and sweetbriar (*Rosa eglanteria*).

Table 1. Sinlahekin 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 2003*
Dalmatian Toadflax	<i>Linaria dalmatica</i> ssp <i>dalmatica</i>	Bd	Bd	4
Diffuse knapweed	<i>Centaurea diffusa</i>	B	B&Cr/B&Cs	2
Watermilfoil	<i>Myriophyllum spicatum</i>	B		3
Herb Robert	<i>Geranium robertianum</i>	Bd		4
Hoary alyssum	<i>Berteroa incana</i>	Bd	Bd	5
Houndstongue	<i>Cynoglossum officinale</i>	B	B&Cr	1
Kochia	<i>Kochia scoparia</i>	B	B&Cs	3
Perennial sowthistle	<i>Sonchus arvensis</i>	Bd	B&Cr	3
Purple Loosestrife	<i>Lythrum salicaria</i>	Bd		5
Russian knapweed	<i>Acroptilon repens</i>	B	B&Cr	2
Saltcedar	<i>Tamarix spp.</i>	Bd		5
Baby's breath	<i>Gypsophila paniculata</i>	C	B&Cs	5
Black henbane	<i>Hyoscyamus niger</i>	C		5
Bull thistle	<i>Cirsium vulgare</i>	C		4
Canada thistle	<i>Cirsium arvense</i>	C	B&Cs	1
Dodder	<i>Cuscuta approximata</i>	C		1
Field bindweed	<i>Convolvulus arvensis</i>	C		3
Whitetop or Hoary cress	<i>Caradria draba</i>	C	B&Cr	4
Reed canarygrass	<i>Phalaris arundinacea</i>	C		2
St. Johnswort	<i>Hypericum perforatum</i>	C		3
White cockle	<i>Silene latifolia</i> aka <i>Lychnis alba</i>	C		4
Yellow Iris	<i>Iris pseudocorus</i>	C		5
Russian thistle	<i>Salsola kali</i>		B&Cs	3
Silvery cinquefoil	<i>Potentilla argentea</i>	M		3
Water-cress	<i>Rorippa nasturtium- aquaticum</i>	M		3
Common mullein	<i>Verbascum thapsus</i>	M	B&Cs	2

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.

*Abundance Codes: **1**= abundant in multiple plant communities; **2**=common in multiple plant communities; **3**=common in specific plant communities; **4**=uncommon, present at 5 to 20 sites; **5**=rare, present at 5 or fewer sites

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) and the TNC Invasive Species Initiative web site (<http://tncweeds.ucdavis.edu>).

DALMATIAN TOADFLAX CONTROL PLAN

Scientific Name: *Linaria dalmatica* ssp. *dalmatica*

Common Name: Dalmatian toadflax

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

Dalmatian toadflax is an erect, short-lived, perennial herb, 0.8 to 1.5 m tall. Dalmatian toadflax is a perennial species that spreads by horizontal or creeping rootstocks and by seed. Leaves are broad, 2-5 cm long, ovate to ovate-lanceolate, 1-2.5 cm long and are alternate, generally clasping but crowded. Flowers are born in loose, elongate, terminal racemes. The pedicels are 2-4 mm long when the flowers are mature and releasing pollen. The calyx is 5-7.5 mm long, the segments subequal, broadly lanceolate to ovate, sharply acute, and rigid. The corolla is strongly two-lipped and 14-24 mm long, excluding the 9-17 mm spur. The upper lip is 10-15 mm long. The lower lip is 5-11 mm long with a well-developed palate closing off the throat. The palate is densely white to orange bearded. Flowers are bright yellow. *Linaria genistifolia* ssp. *dalmatica* typically flowers from May to August. It produces egg-shaped to nearly round capsulate fruits 4-10 mm long by 4-8 mm wide. Seeds are sharply angular, slightly winged, and 1-2 mm long. A mature plant can produce up to 500,000 seeds annually, and they can remain dormant for up to ten years. Dalmatian toadflax produces seed from July to October. Dalmatian toadflax rapidly colonizes open sites. It is most commonly found along roadsides, fences, range lands, croplands, clear cuts, and pastures. Disturbed or cultivated ground is a prime candidate for colonization. Toadflax can significantly reduce crop yields and stress native communities. Dalmatian toadflax is a persistent, aggressive invader capable of forming colonies through adventitious buds from creeping root systems. These colonies can push out native grasses and other perennials, thereby altering the species composition of natural communities. In North America toadflax is considered a strong competitor. It is quick to colonize open sites, and are capable of adapting growth to a wide range of environmental conditions (4). It is listed as weeds in North America, and is on noxious weed lists of several states and Canadian provinces.

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

Dalmatian toadflax is most common in the western United States. In northeastern Washington, it is spread throughout open, low-elevation, coniferous forests and adjacent shrub-steppe. In Colorado, it is commonly found between 1,524 to 1,981 meters (5,000 to 6,500 feet) in oak, aspen, sagebrush, mountain brush, and riparian communities. Once established, high seed production and the ability for vegetative reproduction allow for rapid spread and high persistence (Saner *et al.* 1995). It relies upon insects for pollination. The two most important pollinators are 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.

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. Both *C. lunula* and *M. janthinus* are present on the SWA. *M. janthinus* releases have been made on Dalmatian Toadflax infestations in the Gibson Creek and Spikeman Creek satellite parcels areas. *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

The earliest known observations of Dalmatian toadflax were in the Gibson Creek and Spikeman Creek areas northwest of Fish Lake. It is suspected that it became established when contaminated heavy equipment was brought into the area to fight the Fish Lake fire in 1977 or by contaminated equipment used in the post fire salvage logging operation in 1978. Dalmatian toadflax is widespread on DNR lands adjacent to the Gibson Creek satellite parcel and is spreading on this relatively inaccessible site. The greatest number of patches (from a few plants to an area 20 feet in diameter) is found from Blue Lake south to about 1 mile north of Fish Lake. One small patch is just south east of Conner Lake adjacent to the abandoned service road just south of the Quaking Aspen patch. A very large patch and several smaller patches were discovered north and east of the Elm Tree plantation. There are 2 other known sites on the north end of the SWA.

ACRES AFFECTED BY WEED: Consolidated in the Sinlahekin Valley it would be ~ 5 acres. On the satellite parcels and the general area Dalmatian Toadflx is scatterd over several hundred acres primarily on DNR lands adjacent to the SWA satellite parcels.

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 SWA.

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 SWA website regarding Dalmatian toadflax identification and control

ACTIONS PLANNED

In 2006 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. Monitoring will continue on an annual basis at all sites. Continue systematic gridding for Dalmatian Toadflax on the SWA. GPS and map newly located infestations.

CONTROL SUMMARY AND TREND

2000- Approximately < 1 acre was treated.

2001- Approximately < 1 acre was treated.

2002- Approximately < 1 acre was treated.

2003- Approximately < 1 acre was treated.

2004- Approximately < 1 acre was treated.

2005- Approximately < 1 acre was treated.

Trend on a patch basis is static to decreasing with exception of the Gibson Creek parcel, which is likely increasing. With increased efforts of searching, more small patches have been located and are being treated. *Mecinus janthinus* has been released in the Gibson Creek satellite area. The DNR has also released *M. janthinus* in the area. Initial releases were made in 2001. A large ~ .3 acre patch with several smaller satellite patches, discovered in 2005 had *M. janthinus* and *Calophasia lunula* present indicating that these bioagents are present and finding Dalmatian toadflax infestations. A note of interest that the nearest recorded release site for *Mecinus janthinus* is at least 10 miles from this site and the nearest site for *Calophasia lunula* is over 20 miles from this site. Another note of interest is that a Dalmatian toadflax patch about a mile north of Fish Lake was hand pulled twice a year beginning in 1998 through 2004. There was evidence, i.e., plant skeletons with seed pods, that several plants had successfully produced seed in 1997. It is unknown if this is the only seed produced at this site or if seed was produced earlier. A minimum of twice each year the site and surrounding area was searched for Dalmatian Toadflax plants and all plants found were hand pulled with efforts to excavate the roots and get the entire roots to reduce sprouting from roots. During this time there was no Dalmatian Toadflax seed produced, however in the spring of 2005 there were numerous Dalmatian Toadflax seedlings growing in the vicinity of where the observed seed production had occurred in 1997 and/or earlier. Thus Dalmatian Toadflax seed has demonstrated that it can remain viable in the soil for a minimum of 7 years. In 2005 the site was sprayed with Tordon.

HOUNDSTONGUE CONTROL PLAN

Scientific Name: *Cynoglossum officinale*

Common Name: Houndstongue

DESCRIPTION: Houndstongue is a biennial or short-lived perennial that grows 1-4 ft tall. Houndstongue is a very strong competitor that competes with desirable forage. Its thick, deep taproot enables it to be a strong competitor for soil resources. The seeds have the ability to attach to people, the coats of livestock and vehicles, enabling the plant to spread great distances. Houndstongue is poisonous. It contains pyrrolizidine alkaloids that stop the reproduction of liver cells. Considered non-palatable under range conditions, livestock will avoid it. However, houndstongue is eaten when dried plants are found in hay, and the toxic properties are still capable of poisoning livestock.

Seeds germinate from February to May. Seeds remaining on the soil surface can remain viable up to two years. At 1-6 inch soil depth the seeds germinate within one year. The highest germination percentage occurred in seeds buried at 1/2inch. A rosette forms the first year and is able to resist mowing and grazing and also able to withstand severe drought. Flowering occurs the following year around June and seeds are formed and dropped at the end of the summer. The seeds overwinter in about the top 1cm of soil.

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.

Cultivation of young rosettes in the autumn or early spring gives effective control. Mow flowering stems close to ground to reduce seed set. Clipping during the second year flowering can greatly reduce seed production. Reseed problem areas with fast growing grasses. Do not overgraze. Biocontrols for houndstongue include *Mogulones cruciger* (approved and released in Canada) is a root-feeding weevil. Another, *Longitarsus quadriguttatus*, has good results but may have an effect on native North American Boraginaceae (Lamming).

CURRENT DISTRIBUTION ON THE SITE

Houndstongue is distributed throughout the entire SWA, primarily in riparian areas, however there are scattered plants and patches in the uplands.

ACRES AFFECTED BY WEED: ~200

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 5 years until site is declared weed free, i.e., it has been at least 5 years since Houndstongue seed was produced at the site and or live Houndstongue 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 Houndstongue.
- If available 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 SWA.
- Develop posters to place on reader boards to educate the public about Houndstongue identification and control.
- Develop brochures to hand out to the public regarding Houndstongue identification and control.
- Develop informational material to include on the SWA website regarding Houndstongue identification and control.

ACTIONS PLANNED

In 2006 all known Houndstongue 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.

Monitoring will continue on an annual basis at all sites.

Continue systematic gridding for Houndstongue on the SWA.

GPS and map newly located infestations.

CONTROL SUMMARY AND TREND

2000- Approximately 2 acres were treated.

2001- Approximately 4 acres were treated.

2002- Approximately 15 acres were treated.

2003- Approximately 10 acres were treated.

2004- Approximately 12 acres were treated.

2005- Approximately 20 acres were treated.

Excellent Houndstongue control has been achieved on the SWA by cutting and bagging residual plants that produced seed, cutting plants of the year that have produced seed, cutting young rosettes and young flowering plants before seed production with subsequent visits to the site the following years for up to 5 years. Observations indicate that Houndstongue seeds do not have very good longevity, therefore if seed production is stopped for 2 to 3 years in a row there is little chance there will be viable seeds at the site to restart the infestation. Houndstongue is capable of growing under a wide variety of conditions including: shade, open sun, wet, dry, rocky, sandy and loamy soil conditions and everything between.

RUSSIAN KNAPWEED CONTROL PLAN

Scientific Name: *Acroptilon repens*

Common Name: Russian knapweed

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 μm , spherical, 3-pored, thin-walled, about 2 μm 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/m² (Watson 1980). The plant extends radially in all directions and can cover an area of 12 m² within two years (Watson 1980).

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

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

The keys to controlling Russian knapweed are to 1) stress the weed and cause it to expend nutrient reserves in its root system, 2) eliminate new seed production, and 3) control its vegetative spread. If sufficient human resources are available, mechanical control is good place to start. Pulling Russian knapweed plants two to three times annually contained, but did not eliminate, an infestation in Washington (Youtie 1998). Cutting, mowing or disking several times annually will also control the existing topgrowth. Often, the plants that do re-emerge are smaller in size and lower in vigor. This is a good indication that the plants are under stress and that their nutrient reserves are declining. If an infestation is too large to be treated mechanically, herbicides can be applied for effective control. Tordon™ (picloram), Transline™ (clopyralid), Curtail™ (clopyralid + 2,4-D), and Roundup® (glyphosate) are herbicides that have been shown to be effective (Beck 1996, Duncan 1994). Timing the application of herbicides can be critical and is dependent upon the particular herbicide and surrounding environmental conditions. Biological control agents can place additional stress on Russian knapweed plants. Two biological agents for Russian knapweed have been released in the United States; *Subanguina picridis*, a gall forming nematode, and *Aceria acroptiloni*, a seed gall mite. Once the initial infestation has been controlled, native species should be replanted to act as a vegetative suppressant. Suppressor species must remove a significant amount of moisture from the soil during the seedling stage, when knapweeds are most vulnerable. Early emergence, rapid dense growth, and maintenance of high vigor until frost are attributes required by plant species to suppress Russian knapweed.

CURRENT DISTRIBUTION ON THE SITE

Found in varying degrees of density throughout the SWA.

ACRES AFFECTED BY WEED: ~200+

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 SWA.
- 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 SWA 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. Monitoring will continue on an annual basis sites. Continue systematic gridding for Russian knapweed on the SWA. 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. A comment on the idea of mechanical control of Russian knapweed, it has been the experience on the SWA that efforts of mechanical control resulted in spreading of Russian knapweed to other parts of the fields where this control method was attempted.

CONTROL SUMMARY AND TREND

2000- Approximately 1 acre was treated.
2001- Approximately 1 acre was treated.
2002- Approximately 2 acres were treated.
2003- Approximately 4 acres were treated.
2004- Approximately 30 acres were treated.
2005- Approximately 50 acres were treated.

DIFFUSE KNAPWEED CONTROL PLAN

Scientific Name: *Centaurea diffusa*

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

Currently, there is no single biological control agent that effectively controls diffuse knapweed populations. The biological control of weeds is based on the premise that insect feeding kills and/or stresses plants, or reduces seed production, and eventually causes a reduction in weed density (Berube and Myers 1982). Biological controls, which lower the competitive ability of weeds, could also enhance the effectiveness of other control methods. Biological agents rarely completely eliminate the target pest from an area. Complete elimination of the pest would be self-defeating to long-term control as it would lead to the starvation of the agent and leave the area wide open to re-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. Other biological agents present on the SWA, those attacks diffuse knapweed, including: bronze knapweed root-borer (*sphenoptera jugoslovica*) and banded gall fly (*Urophora affinis*) and UV knapweed seed head fly (*U. quadrifasciata*). Two other biological agents have been released on SWA, but apparently did not become established, including: Knapweed root weevil (*Cyphocleonus achates*) and Grey-winged root moth (*Pterolonche inspersa*).

CURRENT DISTRIBUTION ON THE SITE

Found in varying degrees of density throughout the SWA

ACRES AFFECTED BY WEED: ~5000+ acres

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 SWA.
- 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 SWA 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 SWA. 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- 8 releases of *L. minutus* made throughout SWA

2000- ~300 acre was treated with aerial application.

8 additional releases of *L. minutus* made throughout SWA.

~ 6 acres ground application

2001- Evidence of *L. minutus* observed in majority of diffuse knapweed infestations throughout SWA

~ 6 acres ground application

2002- Impact of *L. minutus* on diffuse knapweed is dramatic. Green diffuse knapweed plants covered with *L. minutus* beetles. Beetles consumed all leaves and green vascular plant material leaving straw-colored skeletons of plants.

2003- Very few to no diffuse knapweed plants throughout most of SWA.

2004- diffuse knapweed rosettes noted in scattered areas throughout SWA, obviously from seed in the soil.

2005- Stands of diffuse knapweed in varying densities growing in scattered areas throughout SWA. Additional bioagents were purchased and distributed throughout SWA. Also bioagents were collected in several isolated areas where there were good populations and redistributed to other areas on SWA.

Diffuse knapweed on SWA has declined significantly since 1998, particularly in 2003, however, the population has increased relative to 2003 due to a large seed bank in the soil. Diffuse knapweed will continue to be present and will need perpetual monitoring and treatment.

KOCHIA CONTROL PLAN

Scientific Name: *Kochia scoparia*

Common Name: Kochia

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

MANAGEMENT INFORMATION:

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

CURRENT DISTRIBUTION ON THE SITE

Found predominately 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 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 SWA.
- 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 SWA website regarding kochia identification and control

ACTIONS PLANNED

In 2006 an effort to locate, document, map and begin eradication 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 SWA thus it was controlled inadvertently during efforts to control other weeds that it may have been growing with. At present kochia abundance on SWA is ranked at 3 or “common in specific locations”.

CANADA THISTLE CONTROL PLAN

Scientific Name: *Cirsium arvense*

Common Name: Canada thistle

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).

At least 3 biological control agents that attack Canada thistle are present on SWA. These include: Canada thistle bud weevil (*Larinus planus*), Thistle stem gall fly (*Urophora cardui*), and Thistle head weevil (*Riynocyllus conicus*). Six releases totaling 300 *L. planus* beetles were made in the spring of 2005. Both *L. planus* and *U. cardui* were already present. Records indicate *U. cardui* was released on the Haeberle place, east of Hess Lake, on the Conconully Road in 1989 by the Okanogan County Noxious Weed Control Board

CURRENT DISTRIBUTION ON THE SITE

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

ACRES AFFECTED BY WEED: ~200+

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 SWA.
- 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 SWA 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. Develop and post information at entrances, parking, camping, hiking, hunting and fishing areas advising visitors of Canada thistle and control. Use mechanical and chemical methods to begin containment of Canada thistle infestations.

CONTROL SUMMARY AND TREND

Canada thistle has not been a priority target weed until 2005 when biological control agents were purchased and released. Other 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. Observations since 1998 have found a high incidence of *R. conicus* in Canada thistle seed heads resulting in reduced seed production and in some cases the number of brown, non seed producing, seed heads outnumbered the seed heads producing seed.

WHITETOP CONTROL PLAN

Scientific Name: *Cardaria draba*

Common Name: Whitetop

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

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

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

C. draba blooms in early spring and looks like conspicuous patches of snowy white (Robbins *et al.*, 1952; Fischer *et al.*, 1978). The showy inflorescences consist of many white flowers in a flattened corymb of racemes. The flower pedicels (stalks) diverge slightly from the stem. Each flower is 2mm wide, and has four petals with long narrow bases, like a spoon (Robbins *et al.*, 1952; Mulligan & Findlay, 1974). The sepals are green and 1.5-2.5mm long. Like other mustard species, there are six stamens and one pistil. *Cardaria* species are native to southwest Asia, although *C. draba*'s range extends into southeast Europe (Mulligan & Frankton, 1962). *C. draba* probably traveled to the USA in ship's ballast or contaminated alfalfa (Mulligan & Findlay, 1974). It was first collected in North America in Yreka, California in 1876, and Ontario, Canada in 1878 (Robbins, 1940; Mulligan & Findlay, 1974). Other collections, such as in Napa, California (in 1893), a southwestern alfalfa field (in 1898), and New York City (also in 1898) firmly established its presence on the continent (Robbins, 1940; Robbins *et al.*, 1952).

MANAGEMENT INFORMATION:

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

Successful control is most likely achieved with a combination of approaches. Selleck (1965) used a combination of mowing and competitive cropping to control *C. chalepensis* and *C. pubescens*. O'Brien and O'Brien (1994)--managers for The Nature Conservancy--controlled *C. draba* by ceasing its irrigation, removing outlying plants, and increasing the general health of the grasslands they were managing. Other managers for The Nature Conservancy have decreased grazing (Carr, 1995), or developed restoration plans (Hill, 1995).

Prevent new infestations originating from seed sources. Seed may travel in contaminated hay, on farming equipment, and in fresh manure (Carr, 1995). *Cardaria* seeds have been eliminated from manure after one month of decomposition under very moist, warm conditions in late summer (Anonymous, 1970). Cutting is somewhat effective in controlling *C. draba*. A combination of weed-whacking and applying 2,4-D from a backpack sprayer has provided 50% control at a preserve maintained by The Nature Conservancy (O'Brien & O'Brien, 1994). Meanwhile, a single late-April treatment of cutting plants back to the ground did nothing to control plants in England (Willis, 1950). Cutting in this way, combined with an herbicide application, was no more effective than using herbicides alone. If cutting is to be used, it clearly should be timed properly. Cutting before plants are flowering does little to control plants, while waiting for the plants to be in full flower will result in smaller plants and less seed production (McInnis *et al.*, 1990). However, McInnis *et al.* 1990 recommend that cutting plants be combined with grazing as a primary or long-term solution for control of *C. draba*.

CURRENT DISTRIBUTION ON THE SITE

There are only 2 known sites where whitetop occurs. Both of these sites are being closely monitored.

ACRES AFFECTED BY WEED: ~1

WEED DENSITY: Low

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 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 Whitetop seed was produced at the site and or live Whitetop plants have been observed at the site.
- Treat infestations according to protocol, i.e., handpull and bag, spray.
- More accurately calculate and delineate, on maps, the acres affected by Whitetop.
- Establish regulations and procedures for assuring off road equipment is washed clean of soil and plant material before entering the SWA.
- Develop posters to place on reader boards to educate the public about Whitetop identification and control.
- Develop brochures to hand out to the public regarding Whitetop identification and control.
- Develop informational material to include on the SWA website regarding Whitetop identification and control

ACTIONS PLANNED

In 2006 the 2 known Whitetop infestations will be monitored and treated if any sign of Whitetop is found. Develop and post information at entrances, parking, camping, hiking, hunting and fishing areas advising visitors of Whitetop and control.

CONTROL SUMMARY AND TREND

Whitetop has been a priority target weed since 2002 when a small patch was found on Stalder Road roadside. It has been chemically treated and plants about to produce seed were pulled, bagged and burned. In 2003, another small patch was found on the west side of Sinlahekin Creek south of Cecile Creek bridge. This patch has been visited twice per year and treated accordingly. Provided there are no other Whitetop infestations, this weed should be well under control.

CONTROL SUMMARY AND TREND

2002- 1 patch < 1 acre was treated.

2003- 2 patches < 2 acres were treated.

2004- 2 patches < 2 acres were treated.

2005- 2 patches < 2 acres were treated.

Whitetop is nearly eradicated on SWA.

GENERAL WEEDS CONTROL PLAN

Scientific Name: *Many*

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, Quakegrass, 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

SWA 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., 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 SWA.
- 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 SWA 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:

Watermilfoil (*Myriophyllum spicatum*)

Herb-Robert or Robert geranium (*Geranium robertianum*)

Hoary alyssum (*Berteroa incana*)

Perennial sowthistle (*Sonchus arvensis*)

Purple Loosestrife (*Lythrum salicaria*)

Tamarisk (*Tamarix* spp.).

Black henbane (*Hyoscyamus niger*)

Bull thistle (*Cirsium vulgare*)

Field morning-glory (*Convolvulus arvensis*)

Dodder (*Cuscuta approximata*)

Baby’s breath (*Gypsophila paniculata*)

St. John’s-wort (*Hypericum perforatum*)

Yellow iris (*Iris pseudacorus*)

White campion or white cockle (*Lychnis alba* aka *Silene alba*)

Reed canarygrass (*Phalaris arundinacea*).

Silvery cinquefoil (*Potentilla argentea*)

Watercress (*Rorippa nasturtium-aquaticum*)

Common mullein (*Verbascum thapsus*).

Russian thistle (*Salsola kali*)

Russian olive (*Elaeagnus angustifolia*)

Common Bladder senna (*Colutea arborescens*)

Sheep sorrel (*Rumex acetosella*)

Tartarian honeysuckle (*Lonicera tartarica*)

Bommon burdock (*Arctium minus*)

Sweetbriar (*Rosa eglanteria*)

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 SWA include:

- 1) Perform regular inventories, gridding with groups of volunteers, e.g., Backcountry Horsemen or paid employees, e.g., WCC crews, of the SWA 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) SWA personnel will learn to identify all weed species in all phenological stages and weed species with potential of infesting the SWA.
- 7) Additional weed prevention actions will include:

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

Grazing Permits – all livestock entering, crossing or using the Sinlahekin Wildlife Area will be fed weed free forage for 3 days prior to entry on the SWA. 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 SWA will be free of weed seeds. All equipment will be power washed and free of plant materials and soil before entering the SWA; all livestock will be inspected before entering the SWA. 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 SWA. 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 SWA. 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 SWA. 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 SWA. 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 SWA. 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 SWA. 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 SWA. 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 SWA or being moved to a new area on the SWA. 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 SWA. 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 SWA. 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 SWA. 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 SWA and associated equipment will be weed free before leaving the SWA and/or entering neighbors' property.

SWA Equipment and Personnel – all SWA equipment entering the SWA including, but not limited, to pickups, 4-wheelers, ORVs, 4-wheel drives shall be weed-free. All SWA equipment will be power washed and free of plant materials and soil before entering the SWA. All SWA 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 SWA. 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 SWA with a dog shall make sure that their dog(s) are weed free before letting the dog loose on SWA. Additionally they shall make sure that their dog is weed free before moving to a new site on the SWA or leaving the SWA.

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 SWA. 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 SWA. 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 SWA. 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 SWA. 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 SWA. 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 SWA. 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 SWA 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. Sinlahekin Wildlife Area Fire Management Plan

Part I Wildfire Control and Suppression

Responsible Fire-Suppression Entities: Depending upon where a wildfire occurs, the appropriate entity must be contacted first, followed by an immediate call to other jurisdictions adjacent to the wildfire. In some cases, where there are multiple landowners or wildfire responders, wildfire suppression activities may involve two or more fire fighting entities. With the exception of the area from the south end of Doheny Lake (approximately 520 acres in Section 35 T36N R25E and 40 acres in Section 2 T35N R25E), which is included in Okanogan County Rural Fire District (OCRFD) #9, the Sinlahekin Wildlife Area (SWA) falls entirely within the jurisdiction of the Washington Department of Natural Resources (DNR), however WDFW maintains a contract with OCRFD #10 – Loomis, for structure fire protection at the Sinlahekin Headquarters. Additionally the USDA FS Tonasket Ranger District provides wildfire protection to their lands adjacent to southern portions of the SWA and would likely respond to wildfires threatening their lands. Approximately 3,000 acres of federally owned land under USDI BLM administration is part of the SWA. The BLM has a fire management program out of Spokane thus making timely response to fires an impossibility.

WDFW pays an annual fee to Okanogan County RFD #10 to maintain an existing structure fire protection services contract. This fee is in addition to Payment In Lieu of Taxes (PILT) paid to the county and is based on the assessed value of the Wildlife Area. In the case of RFD #9 this is approximately 560 acres, however RFD #10 boundary does not include any part of the SWA. Suppression on all WDFW lands within the State Fire Protection Boundary is performed by DNR. WDFW pays an assessment fee for each acre within the wildfire protection boundary for these services. DNR will respond to all wildfires on the SWA, as a preventive measure to protect DNR lands, since most of the SWA is surrounded by DNR lands.

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 SWA habitat is fire dependent and fire is needed to maintain healthy habitat, 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 SWA should be aggressive. As more prescribed fire is applied to SWA lands, fire severity potential will decrease substantially resulting in easier wildfire suppression and management.

Other Concerns: 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 SWA are structures, e.g., buildings, bird feeders, guzzlers, power poles, etc. Additionally the preferred strategy for ground based fire suppression on the SWA 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 wildfires 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 Sinlahekin 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 SWA 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.

Fire Districts – Dial 911

NAME	TELEPHONE	CELL
Okanogan Co. District #10, Loomis (Brent Dell, Chief)		
Okanogan Co. District #9, Conconully (Tyson Woodward)	509.422.3642	

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) *
DNR Omak District Office	509.826.7316*

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, SWA Manager	509.223.3358		
Don Garrett, SWA Assistant Manager	509.826.4626		509.322.3966
Jim Olson, Scotch Creek Manager	509.826.4430		509.429.0796
Troy McCormick, Fish & Wildlife Officer	509.422.7206 (Ok. Co Sheriff (Dispatch))		

Dan Christensen, Fish & Wildlife Officer, Tonasket	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)		

***NOT FOR PUBLIC DISSEMINATION**

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. Sinlahekin Wildlife Area 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
CS4-SWC29	S4*38 029 J	I	Chng ROE	4/14/1881	IR					37.0N 25.0E 03	SE/NE	1	Sinlahekin Creek	
CS4-SWC3568		I	Chg App	9/26/1901			CFS			37.0N 25.0E 02			Similkameen River	
CS4-SWC3568		I	Chg App	9/26/1901			CFS			37.0N 25.0E 03	NE/NE		Similkameen River	
CS4-SWC3568		I	Chg App	9/26/1901			CFS			38.0N 25.0E 35		3	Similkameen River	
CS4-SWC3568@1		I	Temp Use	1/28/2002	FS		CFS			37.0N 25.0E 02		3	Similkameen River	Vol. relinquishment 10/1989
CS4-SWC3568@1		I	Temp Use	1/28/2002	FS		CFS			37.0N 25.0E 03	NE/NE		Similkameen River	Vol. relinquishment 10/1989
CS4-SWC3568@1		I	Temp Use	1/28/2002	FS		CFS			38.0N 25.0E 35			Similkameen River	Vol. relinquishment 10/1989
CS4-SWC40		A	Chng ROE	4/14/1881			CFS			37.0N 25.0E 03	SE/NE	1	Sinlahekin Creek	
R4- *08888ABBCWRI S	03568 A	A	Cert	3/18/1949	FS, WL		CFS			38.0N 25.0E 02	SW/NW		Sinlahekin Creek	
R4- *08888ABBCWRI S	03568 A	A	Cert	3/18/1949	FS, WL		CFS			38.0N 25.0E 02	NE/SW		Sinlahekin Creek	
R4- *08888ABBCWRI S	03568 A	A	Cert	3/18/1949	FS, WL		CFS			38.0N 25.0E 03	NE/NE		Sinlahekin Creek	
R4- *08888ABBCWRI S	03568 A	A	Cert	3/18/1949	FS, WL		CFS			38.0N 25.0E 03	SE/NE		Sinlahekin Creek	
R4- *08888ABBCWRI S	03568 A	A	Cert	3/18/1949	FS, WL		CFS			38.0N 25.0E 03	SE/NE		Sinlahekin Creek	
R4- *08888ABBCWRI S	03568 A	A	Cert	3/18/1949	FS, WL		CFS			38.0N 25.0E 03	NE/SE		Sinlahekin Creek	
R4- *08888ABBCWRI S	03568 A	A	Cert	3/18/1949	FS, WL		CFS	10.00		38.0N 25.0E 35	NW/NE	8	Sinlahekin Creek	
R4- *08888ABBCWRI S	03568 A	A	Cert	3/18/1949	FS, WL		CFS			38.0N 25.0E 35	NE/NW		Sinlahekin Creek	
R4- *09654CWRIS	4085	A	Cert	6/2/1950	FS, WL		CFS	304.00		38.0N 25.0E 35		1	Sinlahekin Creek	Cert may be in error-- change required
R4- *09655CWRIS	6075	A	Cert	6/2/1950	FS, WL		CFS	46.00		38.0N 25.0E 27		1	Unnamed stream	
R4- *09655CWRIS	6075	A	Cert	6/2/1950	FS, WL		CFS	46.00		36.0N 25.0E 27		1	Unnamed stream	
S4-*38029JWRIS	S4*38 029 J	A	Adj Cert	1/1/1910	IR	1.10	CFS	360.00	60.00	37.0N 25.0E 03	SE/NE	1	Sinlahekin Creek	
S4-*38035JWRIS	S4*38 035 J	A	Adj Cert	1/1/1901	IR	0.55	CFS	180.00	30.00	37.0N 25.0E 03	NE/SW	2	Sarsapkin Creek	
S4-*38035JWRIS	S4*38 035 J	A	Adj Cert	1/1/1901	IR		CFS	180.00	30.00	37.0N 25.0E 03	SW/SE		Sarsapkin Creek	
S4-*38035JWRIS	S4*38 029 J	A	Adj Cert	1/1/1901	IR		CFS	180.00	30.00	37.0N 25.0E 03	SW/SE		Sarsapkin Creek	
S4-*38036JWRIS	S4*38 036 J	A	Adj Cert	1/1/1901	IR	1.10	CFS	360.00	60.00	37.0N 25.0E 10	SE/NW	1	Sinlahekin Creek	
S4-*38037JWRIS	S4*38 037 J	A	Adj Cert	1/1/1901	IR	2.03	CFS	660.00	110.00	37.0N 25.0E 03	SE/NE	1	Sinlahekin Creek	Relinquishment in process

S4-*38040JWRIS	S4*38040 J	A	Adj Cert	1/1/1901	IR	2.29	CFS	660.00	110.00	37.0N 25.0E 03	SE/NE	1	Sinlahekin Creek	Relinquishment in process
S4-*38041ALJWRIS	S4*38041AL J	A	Adj Cert	1/1/1901	IR	1.55	CFS	428.20	74.70	37.0N 25.0E 15		3	Sinlahekin Creek	
S4-*38041ALJWRIS	S4*38041AL J	A	Adj Cert	1/1/1901	IR	1.55	CFS	428.20	74.70	38.0N 25.0E 15		3	Sinlahekin Creek	
S4-*38041ALJWRIS	S4*38041AL J	A	Adj Cert	1/1/1901	IR		CFS			37.0N 25.0E 15			Sinlahekin Creek	
S4-*38041ALJWRIS	S4*38041AL J	A	Adj Cert	1/1/1901	IR		CFS			38.0N 25.0E 15			Sinlahekin Creek	
S4-*38041ALJWRIS	S4*38041AL J	A	Adj Cert	1/1/1901	IR		CFS			37.0N 25.0E 21			Sinlahekin Creek	
S4-*38041ALJWRIS	S4*38041AL J	A	Adj Cert	1/1/1901	IR		CFS			38.0N 25.0E 21			Sinlahekin Creek	
S4-*38044JWRIS	S4*38044 J	A	Adj Cert	1/1/1901	IR	2.59	CFS	744.00	124.00	38.0N 25.0E 14		1	Sinlahekin Creek	Relinquishment in process
S4-*38051ALJWRIS	S4*38051AL J	A	Adj Cert	1/1/1901	IR	0.74	CFS	240.00	40.00	38.0N 25.0E 23		2	Sinlahekin Creek	
S4-*38051ALJWRIS	S4*38051AL J	A	Adj Cert	1/1/1901	IR		CFS			38.0N 25.0E 23			Sinlahekin Creek	
S4-045984CL		A	Claim L	3/1/1889	No ID	0.50	CFS	60.00		36.0N 25.0E 17		1	Spikeman Creek	
S4-045985CL		A	Claim L	3/1/1889	IR	0.60	CFS	120.00	30.00	36.0N 25.0E 22		1	Fish Lake	
S4-045986CL		A	Claim L	1/1/1902	No ID	1.00	CFS	180.00		36.0N 25.0E 16		1	Gibson Creek	
S4-045987CL		A	Claim L	1/1/1900	No ID	0.02	CFS	2.00		36.0N 25.0E 22		1	Unnamed stream	
S4-045996CL		A	Claim L	1/1/1920	No ID	0.02	CFS			36.0N 25.0E 03		1	Zachman Pond	
S4-045991CL		A	Claim L	7/1/1889	ST	2.50	CFS	2.00		36.0N 25.0E 04		1	Unnamed stream	
S4-045990 CL		A	Claim L	1/1/1891	ST	1.00	CFS	12.00		36.0N 25.0E 10		1	Unnamed stream	
S4-045990 CL		A	Claim L	1/1/1891	ST	1.00	CFS	12.00		36.0N 25.0E 10		1	Unnamed spring	
S4-045993 CL		A	Claim L	6/1/1902	No ID	1.00	CFS	25.00		36.0N 25.0E 11		1	Sasse Pond	
S4-045994CL		A	Claim L	5/1/1903	DG		CFS			36.0N 25.0E 14		1	Hicks Canyon Creek	
S4-045994CL		A	Claim L	5/1/1903	DG		CFS			36.0N 25.0E 15		1	Hicks Canyon Creek	
S4-045988CL		A	Claim L	1/1/1902	No ID		CFS			36.0N 25.0E 15		1	Reservoir	
S4-045989CL		A	Claim L	1/1/1920	WL		CFS			36.0n 25.0E 15		1	Unnamed spring	
S4-045989CL		A	Claim L	1/1/1920	WL		CFS			36.0n 25.0E 15		1	Unnamed stream	

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. *Paired color rows have discrepancies that need reviewed – Only one line is correct, the incorrect line needs ID'ed and deleted. Note: Copies of original documents in file

APPENDIX 5. Management Plan Comments & Responses

Washington State Department of Fish and Wildlife, February 2007

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

Comment Author	Organization	Location
Rob Diess	Citizen	

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

Commenter	Comment	Response
	Hunting Season	
Rob Diess	Season too early, local bucks killed off in the first couple of days with no migration starting.	This issue falls outside the mission of the Lands Division and Wildlife Area Section. It will be forwarded to the District Wildlife Biologist.
	Grazing	
Rob Diess	Too many cattle, thin it out and get them pulled out before hunting season opens.	The Sinlahekin is bordered by Department of Natural Resource lands, US Forest Service lands and private lands most have grazing permits. With one exception there are no grazing permits on the Sinlahekin after June 15. The exception is a permit allowing 2 weeks of grazing for 100 Animal Units (AU) between October 15 and Nov 15 during even numbered years. There are 2 crossing permits one in the Fish Lake area and one in the Cecile Creek area allowing the cattle owners to trail their cattle, from permits on other lands, across these areas of the Sinlahekin Wildlife Area during the spring and fall. Aside from these there have been issues of trespass cattle on the Sinlahekin that are addressed as soon as they are discovered. The owners have been very cooperative in removing the cattle in a timely manner.

	Public Access	
Rob Diess	Too many assholes riding quads in the closed areas. Other vehicles too, going around gates and such. I've seen quad tracks up on ridgelines and in forested land damaging all plantlife in the way.	Quads or 4-wheelers and dirt bikes are specifically prohibited on the Sinlahekin Wildlife Area. Operation of any unauthorized vehicle off of open roads is strictly prohibited. Signs stating the above regulations are posted at entrances to the Sinlahekin and at most of the campground entrances. The Enforcement Program with its limited resources does patrol the Sinlahekin looking specifically for off-road travel, unauthorized 4-wheelers and dirt bikes as well as other violations on the Sinlahekin. Everybody who observes a violation is urged to get license numbers, vehicle descriptions, descriptions of violators, times, dates and locations of violations and report the information to WDFW Enforcement, the Okanogan County Sheriff's Office or the Washington State Patrol as soon as possible.

Other comments/issues received that apply to all wildlife areas:

Issue: ALL Plans; ALL Wildlife Protect& No Kill on The Largest of ALL Species as These Are The Strongest& Reproduce the Most& Best Offsprings.

Response: The SWA management plan addresses management of the landscape vegetation and processes affecting the vegetation, excluding wildlife as a process affecting the vegetation. In as much as the wildlife are an integral part of the habitat and landscape processes, it is not within the preview of the management plans to address harvest, but rather address management of the vegetation. This issue will be passed on the District Wildlife Biologist.

Issue: This is for ALL plans. For past management plans, I would like to see what actually was accomplished during the period. Plans are nice. I planned to retire at 30. 30 years later I still have not. So what have you done with my tax money?

Response: Although the management plan does not specifically list accomplishments prior to the date of the plan, it does include a brief history of management activities in Chapter 2. Also, the weed control appendix includes control summary and trend information indicating some past weed control activities. The current wildlife area management plan will be updated annually. Updates, which will be posted on the agency web site, will include a report of key activities accomplished the previous year.

APPENDIX 6. Climatic Information

CONCONULLY, WASHINGTON (451666): MONTHLY CLIMATE SUMMARY

Period of Record : 6/ 2/1948 to 10/31/2003

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	30.6	38.5	47.0	57.9	67.5	74.1	81.9	81.2	72.6	57.8	41.1	31.7	56.8
Average Min. Temperature (F)	13.4	19.6	26.0	33.8	41.7	47.9	53.0	52.5	44.9	35.0	25.3	16.8	34.2
Average Total Precipitation (in.)	1.54	1.36	1.24	1.03	1.44	1.54	0.85	0.97	0.63	0.96	1.60	1.73	14.88
Average Total Snow Fall (in.)	14.1	4.8	3.8	0.3	0.0	0.0	0.0	0.0	0.0	0.2	3.6	11.8	38.5
Average Snow Depth (in.)	8	6	2	0	0	0	0	0	0	0	0	3	2

Percent of possible observations for period of record.

Max. Temp.: 91% Min. Temp.: 90.8% Precipitation: 91.1% Snowfall: 78.3% Snow Depth: 71.4%

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

Western Regional Climate Center, wrcc@dri.edu

TONASKET 4 NNE, WASHINGTON (458520): 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 Snow Fall (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.

Western Regional Climate Center, wrcc@dri.edu

APPENDIX 7. Species and Habitat Information

7a – Birds

Under construction

7b – Mammals

Under construction

7c – Herptiles – Reptiles and Amphibians

A GUIDE TO THE REPTILE AND AMPHIBIAN SPECIES OF THE SINLAHEKIN WILDLIFE AREA

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Send suggestions, additions and corrections to:
swedbdas@dfw.wa.gov

Habitat: Primary habitats where species may be observed at, or near, Sinlahekin Wildlife Area (SWA)

A - Agriculture (grainfields, abandoned orchards, alfalfa fields, etc.)

C - Conifer woodland (Ponderosa pine, Douglas fir, Western Larch, Engleman Spruce)

E - Every habitat

O - Open water

R - Riparian woodland/shrubland (water birch, quaking aspen, Red Osier Dogwood, willow, Alder, rose, etc.)

S - Steppe and shrubsteppe (often includes sagebrush and bitterbrush)

T - Talus, boulder fields, cliffs, and rims

U - Urban (not present at SWA)

W - Wetlands

St - Stream

Presence (Pre): Presence relative to SWA

L - Likely breeder (breeding behavior observed on SWA or eggs or larval form found on SWA)

N - Known breeder (≥ 1 eggs or larval form found within area)

P - Potential breeder

S - Suspected, but not confirmed at SWA

Area/seasonal abundance: Winter (Win), spring (Spr), summer (Sum), and autumn (Aut)

A - Abundant (numerous in appropriate habitats)

C - Common (likely to be observed in appropriate habitats)

I - Intermittent (intermittently present in suitable habitats)

R - Rare (observed every 2 to 5 years)

U - Uncommon (present in suitable habitats, but not certain to be observed)

X - Extremely rare (observed less frequently than every 5 years)

PHS status: ¹SC/L; ²ST; ³SE; ⁴Game; ⁵SC

Seasons: **Winter (Win)** 21 Dec. -19 Mar.; **Spring (Spr)** 20 Mar. - 20 June; **Summer (Sum)** 21 June -21 Sept.; **Autumn (Aut)** 22 Sept. -20 Dec.

Compiled by Dale A. Swedberg on 2 July 2001

Contributors: Liana Aker, Thomas E. Burke, Anaka Mines, Andreas Nollert, Christel Nollert, Dale Swedberg, Dana Visalli

✓	*Species Possible But Not Confirmed	Area/seasonal abundance					
		Habitat	Pre	Win	Spr	Sum	Aut
	Blotched Tiger Salamander	W.O	N		U	U	U
	Central Long-toed Salamander	W	L		U	U	U
	Tailed Frog* (<i>Ascaphus truei</i>)	R.W.St	S				
	Great Basin Spadefoot Toad*	R.W	S				
	Western Toad (<i>Bufo boreas</i>) ¹	R.W	L		U	U	U
	Pacific Chorus Frog (<i>Pseudacris</i>)	E	N		C	C	C
	Spotted Frog (<i>Rana pretiosa</i>) ¹	R.W	L		U	U	U
	Northern Leopard Frog* (<i>Rana</i>)	W.O	S				
	Western Painted Turtle	W.O	N		A	A	A
	Northwestern Alligator Lizard	S.R.C.T	P		R	R	R
	Short-horned Lizard*	S.C.T	S				
	Northern Sagebrush Lizard*	S	S				
	Northwestern Fence Lizard*	S.C.T	S				
	Skilton (Western) Skink*	S.C.T	S				
	Rubber Boa (<i>Charina bottae</i>)	S.C.T.W	L		U	U	U
	Western Yellowbelly Racer	S.C	L		C	C	C
	Night Snake* (<i>Hypsiglena</i>)	S.C.T	S				
	Great Basin Gopher Snake	S.R.C.T	N		C	C	C
	Western Terrestrial Garter	R.C.W	L		C	C	C
	Valley (Common) Garter Snake	R.C.t.W	L		C	C	C
	Northern Pacific (Western)	S.R.C.W	N		A	A	A

Last Updated: 2008-01-03

7d – Fishes of the SWA

		Probability of Occurrence	PHS Status
Family: Petromyzontidae (lampreys)			
Western Brook Lamprey	P	High	
Family: <i>Salmonidae</i> (Trouts, salmon, char, whitefish, grayling)			
Westslope Cutthroat	X		Game
Lahontan Cutthroat	X		
Rainbow Trout	X		Game
Redband Trout	X		
Kokanee	X		Game
Mtn. Whitefish	P	High	
Brown Trout	X		
Brook Trout	X		
Family: <i>Cyprinidae</i> (Carp and Minnows)			
Chiselmouth	P	High	
Lake Chub	P		
Common Carp	P		
Peamouth Chub	P	High	
Northern Pikeminnow	X		
Longnose Dace	X		
Leopard Dace	P	High	SC
Umatilla Dace	P	High	SC
Speckled Dace	P	Very Low	
Redside Shiner	X		
Family: <i>Catostomidae</i> (Suckers)			
Longnose sucker	P		
Bridgelip Sucker	P	Very Low	
Largescale Sucker	P	High	
Mountain Sucker	P	Very Low	SC
Family: <i>Ictaluridae</i> (Bullhead Catfishes)			
Brown Bullhead	X		
Family: <i>Gadidae</i> (Cods)			
Burbot	P	Low	
Family: <i>Gasterosteidae</i> (Sticklebacks)			
Three-Spined Stickleback	P		
Family: <i>Centrarchidae</i> (Sunfishes)			
Pumpkinseed	P		
Bluegill	P		

Smallmouth Bass	X		
Largemouth Bass	X		
Black Crappie	X		
Family: Percidae (Perches)			
Yellow Perch	P		
Walleye	P		Game
Family: Cottidae (Sculpins)			
Prickly Sculpin	P		
Mottled Sculpin	X		
Paiute Sculpin	P	Very Low	
Slimy Sculpin	P		
Shorthead Sculpin	P		
Torrent Sculpin	P	High	

P = possible occurrence
X = confirmed occurrence

Contributors: Heather Bartlett, Molly Hallock, Paul Mongillo, Alex Uber, Dale Swedberg

A GUIDE TO THE BUTTERFLY SPECIES OF THE SINLAHEKIN WILDLIFE AREA (SWA)

WASHINGTON DEPARTMENT OF FISH & WILDLIFE

Send suggestions, additions, and corrections to:

swedbdas@dfw.wa.gov

Last Updated: April 16, 2007

☐ = known flight season

X = collected or observed on SWA

WA Butterfly
Atlas

Observed
2004-Present

Range 25

✓	*Species Possible But Not Confirmed	Seasonal Flight Period												Township				Township						
		J	F	M	A	M	J	J	A	S	O	N	D	38	37	36	35	38	37	36	35			
PARNASSIANS (<i>Parnassiinae</i>)																								
	Parnassian (<i>Parnassius spp.</i>)							X												X				
	Rocky Mountain Parnassian (<i>Parnassius smintheus</i>)							X													X			
	*Clodius Parnassian (<i>Parnassius clodius</i>)																							
SWALLOWTAILS (<i>Papilioninae</i>)																								
	Old World Swallowtail (<i>Papilio machaon</i>)							X	X								X				X	X	X	
	Anise Swallowtail (<i>Papilio zelicaon</i>)							X										X	X		X		X	
	*Indra Swallowtail (<i>Papilio indra</i>)																							
	*Canadian Tiger Swallowtail (<i>Papilio canadensis</i>)																							
	Western Tiger Swallowtail (<i>Papilio rutulus</i>)					X	X	X									X	X	X	X	X	X	X	X
	Two-tailed Swallowtail (<i>Papilio multicaudatus</i>)					X	X	X		X							X	X	X	X	X	X	X	
	Pale Tiger Swallowtail (<i>Papilio eurymedon</i>)					X	X	X									X	X	X	X	X	X	X	X
WHITES (<i>Pierinae</i>)																								
	Pine White (<i>Neophasia menapia</i>)							X	X												X		X	
	Becker's White (<i>Pontia beckerii</i>)							X										X	X	X	X			
	Spring White (<i>Pontia sisymbrii</i>)			X															X	X				
	Western White (<i>Pontia occidentalis</i>)					X	X	X										X	X	X	X	X	X	
	*Margined White (<i>Pieris marginalis</i>)																							
	Cabbage White (<i>Pieris rapae</i>)					X	X	X	X									X		X	X	X		

Large Marble (<i>Euchloe ausonides</i>)				X	X	X						X	X	X		X	X	X
Desert Marble (<i>Euchloe lotta</i>)						X										X		
Sara's Orangetip (<i>Anthocharis sara</i>)				X	X	X						X	X	X		X		X
SULPHURS (<i>Coliadinae</i>)																		
Clouded Sulphur (<i>Colias philodice</i>)					X	X	X	X					X	X		X	X	X
Orange Sulphur (<i>Colias eurytheme</i>)							X	X				X		X		X	X	
*Western Sulphur (<i>Pontia occidentalis</i>)						?												?
Queen Alexandra's Sulphur (<i>Colias alexandra</i>)						X	X	X					X		X	X	X	X
Pink-edged Sulphur (<i>Colias interior</i>)							X											X
COPPERS (<i>Lycaenini</i>)																		
*Lustrous Copper (<i>Lycaena cuprea</i>)																		
*Ruddy Copper (<i>Lycaena rubida</i>)													X	X				
Blue Copper (<i>Lycaena heteronea</i>)							X	X	X				X	X		X	X	X
Purplish Copper (<i>Lycaena helloides</i>)						X	X	X	X							X	X	X
Lilac-bordered Copper (<i>Lycaena nivalis</i>)								X										X
*Mariposa (Reakirt's) Copper (<i>Lycaena mariposa</i>)																		
HAIRSTREAKS (<i>Theclini</i>)																		
Coral Hairstreak (<i>Satyrium titus</i>)								X	X								X	X
Behr's Hairstreak (<i>Satyrium behrii</i>)							X		X							X	X	X
Halfmoon (Sooty) Hairstreak (<i>Satyrium semiluna</i>) (<i>fuliginosum</i>)							X	X								X		X
California Hairstreak (<i>Satyrium californicum</i>)							X	X				X	X			X	X	
Sylvan Hairstreak (<i>Satyrium sylvinus nootka</i>)								X					X				X	
Hedgerow Hairstreak (<i>Satyrium saepium</i>)								X									X	
Western Green Hairstreak (<i>Callophrys affinis</i>)						X							X	X			X	
Sheridan's Hairstreak (<i>Callophrys sheridani</i>)					X	X										X	X	
Thicket Hairstreak (<i>Mitoura spinetorum</i>)						X							X	X	X		X	
*Cedar Hairstreak (<i>Mitouria grynea barryi</i>)																		
Brown Elfin (<i>Incisalia augustinus</i>)					X	X											X	X
*Moss' Elfin (<i>Incisalia mossii</i>)																		
*Hoary Elfin (<i>Incisalia polia</i>)																		
Western Pine Elfin (<i>Incisalia eryphon</i>)					X	X							X	X		X	X	X
Gray Hairstreak (<i>Strymon melinus</i>)						X		X	X							X	X	X
BLUES (<i>Polyommata</i>)																		
Western Tailed Blue (<i>Cupido amyntula</i>)						X	X						X	X		X		

Anicia Checkerspot (<i>Euphydryas anicia</i>)					X	X									X	X		X	X	X
*Edith's Checkerspot (<i>Euphydryas editha</i>)																				
TRUE NYMPHS (<i>Nymphalini</i>)																				
Satyr Comma (<i>Polygonia satyrus</i>)					X	X	X		X							X	X	X	X	
Green Comma (<i>Polygonia faunus</i>)						X													X	
Hoary Comma (<i>Polygonia gracilis</i>)								X								X			X	
*Oreas Anglewing (<i>Polygonia oreas</i>)																				
Compton Tortoiseshell (<i>Nymphalis vaualbum</i>)					X	X			X	X								X	X	
California Tortoiseshell (<i>Nymphalis californica</i>)					X	X	X	X	X		X					X		X	X	X
Mourning Cloak (<i>Nymphalis antiopa</i>)					X	X	X	X	X	X	X				X		X	X	X	X
Milbert's Tortoiseshell (<i>Nymphalis milberti</i>)					X	X		X	X		X				X	X	X	X	X	
Painted Lady (<i>Vanessa cardui</i>)							X	X	X	X	X					X		X	X	X
West Coast Lady (<i>Vanessa annabella</i>)										X										X
Red Admiral (<i>Vanessa atalanta</i>)							X	X										X	X	
*Viceroy (<i>Limenitis archippus</i>)																				
Lorquin's Admiral (<i>Limenitis lorquini</i>)						X	X	X	X						X		X	X	X	X
SATYRS, BROWNS, RINGLETS (<i>Satyrinae</i>)																				
Common Ringlet (<i>Coenonympha tullia</i>)					X	X	X	X	X	X					X	X	X	X	X	X
Common Wood Nymph (<i>Cercyonis pegala</i>)							X	X	X						X	X	X	X	X	X
Great Basin Wood Nymph (<i>Cercyonis sthenele</i>)						X	X											X		
Small Wood Nymph (<i>Cercyonis oetus</i>)							X												X	
Common (Butler's) Alpine (<i>Erebia epipsodea</i>)					X	X									X		X	X	X	X
*Great Arctic (<i>Oeneis nevadensis</i>)																	X	?		
Chryxus Arctic (<i>Oeneis chryxus</i>)						X										X		X	X	X
MONARCHS (<i>Danainae</i>)																				
Monarch (<i>Danaus plexippus</i>)									X										X	
SPREAD-WING SKIPPERS (<i>Pyrginae</i>)																				
Northern Cloudywing (<i>Thorybes pylades</i>)						X													X	
Dreamy Duskywing (<i>Erynnis icelus</i>)					X	X									X		X	X	X	X
Pacuvius Duskywing (<i>Erynnis pacuvius</i>)																			?	
Persius Duskywing (<i>Erynnis persius</i>)					X											X		X	X	X
Two-banded Checkered Skipper (<i>Pyrgus ruralis</i>)					X											X		X	X	X
*Common Checkered Skipper (<i>Pyrgus communis</i>)																				
*Northern White Skipper (<i>Heliopetes ericetorum</i>)																				

Common Sootywing (<i>Pholisora catullus</i>)					X		X							X			X	X	X	X	X
GRASS SKIPPERS (<i>Hesperiinae</i>)																					
*Arctic Skipper (<i>Carterocephalus palaemon</i>)																					
*Garita Skipperling (<i>Oarisma garita</i>)																					
Juba Skipper (<i>Hesperia juba</i>)																					
Western Branded Skipper (<i>Hesperia colorado</i>)																					
*Common Branded Skipper (<i>Hesperia comma</i>)																					
*Nevada Skipper (<i>Hesperia nevada</i>)																					
*Peck's Skipper (<i>Polites peckius</i>)																					
*Sandhill Skipper (<i>Polites sabuleti</i>)																					
*Tawny-edged Skipper (<i>Polites themistocles</i>)																					
*Sonora Skipper (<i>Polites sonora</i>)																					
Woodland Skipper (<i>Ochlodes sylvanoides</i>)																					
Common Roadside Skipper (<i>Amblyscirtes vialis</i>)																					

TOTAL Number of butterfly species found on the SWA 86
Number of butterfly species seen each month 5 13 34 41 58 31 11

Originally Compiled by Caitlin LaBar on July 10, 2004

Contributors: Bob Hardwick, Norbert Kondla, Caitlin LaBar, Richard Lindstrom, Dave Nunnallee, Holly Robinson, Maria Robinson, Martha Robinson, Shirley Sekarajasingham, Tighe Stuart, Dale Swedberg, Bill Yake,

Dave Nunnallee updated nomenclature & reviewed list Apr 14, 2007

7f – Mollusks

Mollusks, documented and potentially present, on the Sinlahekin Wildlife Area

Terrestrial Mollusks (Adapted from Frest, T. C. and E. J. Johannes list of “Terrestrial Mollusks known to occur in Washington”)

SCIENTIFIC NAME	COMMON NAME	RANGE	PRESENT ON SWA
LAND SNAILS			
<i>Allogona (Dysmedoma) ptychophora ptychophora</i> (Brown 1870)	Idaho forestsnail	SE WA; N. WA E. of the Cascades; Columbia Gorge	
<i>Monadenia (Monadenia) fidelis fidelis</i> (Gray 1834)	Pacific sideband	Cascades through the Olympics	
<i>Ancotrema (Ancomena) sportella sportella</i> (Gould 1846)	beaded lancetooth	Cascades to coast; scattered in N. WA	
<i>Haplotrema (Haplotrema) vancouverense</i> (Lea 1839)	robust lancetooth	Cascades to coast; N. WA	
<i>Cryptomastix (C.) mullani mullani</i> (Pilsbry & Cooke 1922)	Coeur d'Alene oregonian	NE WA; SE WA; ?E. Cascades foothills; Columbia Gorge; ?Blue Mts.	
<i>Cryptomastix (C.) mullani olneyae</i> (Pilsbry & Cooke 1922)	Spokane oregonian	N. WA; Columbia Gorge; ?Blue Mts.; E. Cascades	
<i>Oreohelix junii</i> Pilsbry 1934	Grand Coulee mountainsnail	Grand Coulee; E. Cascades S. to Yakima	
<i>Oreohelix</i> n. sp. 1 Frest & Johannes 1995	Chelan mountainsnail	NE Cascades	
<i>Oreohelix</i> n. sp. 2 Frest & Johannes 1995	Yakima mountainsnail	E. Cascades, Yakima area	
<i>Oreohelix strigosa strigosa</i> (Gould 1847)	Rocky mountainsnail	Grand Coulee; E. Cascades S. to Yakima	
<i>Planogyra clappi</i> (Pilsbry 1898)	western flat-whorl	Cascades and Olympics; N. WA	
<i>Carychium occidentale</i> Pilsbry 1891	western thorn	Cascades and Olympics; N. WA	
<i>Columella alticola</i> Ingersoll 1875	Rocky Mountain column	Cascades to coast; N. WA	
<i>Columella "edentula"</i> (Draparnaud 1805)	toothless column	Cascades to coast; N. WA	
<i>Euconulus fulvus alaskensis</i> (Pilsbry 1899)	western brown hive	Cascades to coast; N. WA; Blue Mts.	Yes
<i>Pristiloma (Pristinopsis) arcticum arcticum</i> Lehnert 1884	northern tightcoil	Higher elevations in the Cascades & Olympics; bogs in same area	
<i>Pristiloma (Priscovitrea) johnsoni</i> (Dall 1895)	broadwhorl tightcoil	W. Cascades to coast	
<i>Pristiloma (Pristinoides) lansingi</i> (Bland 1875)	denticulate tightcoil	Cascades W. to coast	
<i>Pristiloma (P.) stearnsi</i> (Bland 1875)	striate tightcoil	Cascades W. to coast	
<i>Pristiloma (Priscovitrea) chersinella</i> (Dall, 1886)	black-foot tightcoil	eastern Cascades	
<i>Pristiloma (Priscovitrea?) wascoense</i> (Hemphill 1911)	shiny tightcoil	Higher elevations in Cascades & Olympics	
<i>Pristiloma (Pristinopsis) idahoense</i> Pilsbry 1902	thinlip tightcoil	E. Cascades & N. WA	
<i>Striatura pugetensis</i> (Dall 1895)	northwest striate	W. & N. WA	
<i>Vertigo columbiana</i> Sterki 1892	Columbia vertigo	Cascades to coast; also N. WA	
<i>Vertigo concinnula</i> Cockerell 1897	mitered vertigo	?E. Cascades; NE WA; Blue Mts.	
<i>Vertigo modesta modesta</i> (Say 1824)	cross vertigo	Higher elevations and bogs in the Cascades, Olympics, and NE WA	
<i>Vertigo ovata ovata</i> Say 1822	ovate vertigo	N. WA; E. WA	
<i>Vallonia cyclophorella</i> Sterki 1892	silky vallonia	WA E. of the Cascades	
<i>Microphysula ingersolli</i> (Bland 1874)	spruce snail	E. WA	
<i>Nesovitrea binneyana occidentalis</i> (Baker 1930)	western blue glass	Scattered over the state	
<i>Nesovitrea electrina</i> (Gould 1841)	amber glass	Uncommon in NW & N. WA; rare & scattered elsewhere	Yes

SCIENTIFIC NAME	COMMON NAME	RANGE	PRESENT ON SWA
LAND SNAILS			
SLUGS			
<i>Zonitoides arboreus</i> (Say 1816)	quick gloss	Scattered sites over the state	Yes
<i>Zonitoides nitidus</i> (Müller 1774)	black gloss	Introduced; rare in W. WA	Yes
<i>Discus whitneyi</i> Newcomb 1864	forest disc	Scattered sites over the state	Yes
<i>Anguispira kochi occidentalis</i> (Von Martens 1882)	western banded globe	NE WA; Scattered in the Columbia Gorge and rare in W. WA; Blue Mts.	
<i>Helicodiscus salmonaceus</i> Binney 1886	salmon coil	NE & SE WA	
<i>Punctum randolphi</i> (Dall 1895)	conical spot	E. & N. WA	Yes
<i>Paralaoma caputspinulae</i> Reeve 1855	striate spot	Cascades to coast	
<i>Vitrina pellucida</i> (Müller 1774) SWA	western glass-snail	Generally over the state	
<i>Vespericola columbianus</i> (Lea 1838)	northwest hesperian	Cascades to coast	
<i>Radiodiscus (Radiodomus) abietum</i> (Baker 1930)	fir pinwheel	NE WA; Blue Mts.	
<i>Oxyloma hawkinsi</i> (Baird 1863)	boundary ambersnail	N. WA; distribution uncertain	
<i>Oxyloma nuttallianum</i> (Lea 1841)	oblique ambersnail	Scattered in E. WA	
<i>Succinea gabbi</i> Tryon 1866	riblet ambersnail	Scattered in E. WA	
<i>Succinea rusticana</i> Gould 1846	rustic ambersnail	Scattered in E. WA	Yes
<i>Catinella avara</i> (Say 1824)	subovate ambersnail	WA distribution uncertain	
<i>Catinella rehderi</i> (Pilsbry 1948)	chrome ambersnail	Scattered over the state	
<i>Cochlicopa lubrica</i> (Müller 1774)	glossy pillar	Scattered in W. WA, partly introduced; also in E. WA	Yes
<i>Oxychilus alliarius</i> (Miller 1822)	garlic glass-snail	Introduced; widespread in urban areas	
<i>Oxychilus cellarius</i> (Müller 1774)	cellar glass-snail	Introduced; widespread in urban areas	
<i>Oxychilus draparnaudi</i> (Beck 1837)	dark-bodied glass-snail	Introduced; widespread in urban areas	
SLUGS			
<i>Deroceras reticulatum</i> (Müller 1774)	gray gardenslug	Introduced; widespread in urban areas	Yes
<i>Arion (A.) ater ater</i> (Linnaeus 1758)	black arion	Introduced; widespread, even in forests	Yes
<i>Arion (A.) ater rufus</i> (Linnaeus 1758)	red arion	Introduced; widespread, even in forests	
<i>Arion (Kobeltia) hortensis</i> Férussac 1819	garden arion	Introduced; fairly common in urban areas	
<i>Arion (Kobeltia) distinctus</i> Mabile 1868	no common name	Introduced; distribution uncertain	
<i>Arion (Kobeltia) owenii</i> Davies 1979	no common name	Introduced; distribution uncertain	
<i>Arion (Microarion) intermedius</i> Normand 1852	hedgehog arion	Introduced; distribution uncertain	Yes
<i>Arion (Mesarion) subfuscus</i> (Draparnaud 1805)	dusky arion	Introduced; widespread, even in forests	Yes
<i>Arion (Carinarion) circumscriptus</i> Johnston 1828	brown-banded arion	Introduced; distribution uncertain	Yes
<i>Milax gagates</i> (Draparnaud 1801)	greenhouse slug	Introduced; widespread in urban areas	
<i>Prophysaon andersoni</i> (Cooper 1872)	reticulate	Cascades W. to Coast	
<i>Prophysaon coeruleum</i> Cockerell 1890	taildropper	Cascades W. to Coast	
<i>Prophysaon dubium</i> Cockerell 1890	blue-gray taildropper		
<i>Prophysaon papillose</i>	papillose taildropper	Olympic Peninsula; in the Cascades Olympia-Tacoma S. to the Columbia R.; rare on E. side	
<i>Prophysaon foliolatum</i> (Gould 1851)	yellow-bordered taildropper	Olympic Peninsula; in the Cascades, Puget Sound S. to Columbia R.	
<i>Prophysaon humile</i> Cockerell 1890	smoky taildropper	? NE WA	
<i>Prophysaon obscurum</i> Cockerell 1890	mottled taildropper	Olympic Peninsula; Cascades	
<i>Ariolimax columbianus</i> (Gould 1851)	Pacific bananaslug	Cascades to coast; N. WA	
<i>Magnipelta mycophaga</i> Pilsbry 1953	spotted slug	Ferry Co.	

Aquatic Mollusks

SCIENTIFIC NAME	COMMON NAME	RANGE	PRESENT ON SWA
AQUATIC SNAILS			
<i>Radix auricularia</i>	big-eared radix		Yes
<i>Planorbella subcrenata</i>	rough ram's horn		Yes
SCIENTIFIC NAME	COMMON NAME	RANGE	PRESENT ON SWA
BIVALVES – FRESHWATER MUSSELS			
<i>Anodonta kennerlyi</i>	Western Floater		Yes
<i>Anodonta californiensis</i>	California Floater		Yes
<i>Margaritifera falcata</i>	Western Pearlshell		Yes
SCIENTIFIC NAME	COMMON NAME	RANGE	PRESENT ON SWA
BIVALVES – FINGER NAIL CLAMS, PEA CLAMS			

7g - Odonata – Dragonflies and Damselflies
Under construction

7h – Spiders

Under construction

7i – Vascular plants

	Scientific Name	Common Name	Abundance	Alien?	Type	Code	Page	Notes
1	<i>Abies lasiocarpa</i>	subalpine fir	5		t	ABLA	H61	
2	<i>Acer glabrum douglasii</i>	Douglas maple	1		s	ACGLD4	H289	
3	<i>Achillea millefolium</i>	common yarrow	1		p	ACMI2	H478	
4	<i>Actaea rubra</i>	baneberry	5		p	ACRU2	H125	
5	<i>Adenocaulon bicolor</i>	pathfinder	5		p	ADBI	H478	
6	<i>Agoseris heterophylla</i>	annual agoseris	4		a	AGHE2	H478	
7	<i>Agropyron cristatum</i>	crested wheatgrass	1	A	g	AGCR	H614	
8	<i>Agropyron intermedium</i>	intermediate wheatgrass	3		g	AGIN2	H614	
9	<i>Agropyron repens</i>	quackgrass	1	A	g	AGRE2	H615	
10	<i>Agropyron (Pseudoroegneria) spicatum</i>	bluebunch wheatgrass	1		g	AGSPI	D258	
11	<i>Agrostis alba var alba</i>	creeping bentgrass	4	A	g	AGALP	H617	
12	<i>Agrostis interrupta</i>	bentgrass	1	A	g	AGIN4	H616	
13	<i>Alisma plantago-aquatica</i>	American waterplantain	4		p	ALPA	H558	
14	<i>Allium cernuum</i>	nodding onion	2		p	ALCE2	H682	
15	<i>Alnus incana</i>	mountain alder	2		d	ALIN2	H72	
16	<i>Alopecurus aequalis</i>	little meadow-foxtail	3	A	g	ALAE	H620	
17	<i>Alopecurus pratensis</i>	meadow foxtail	3		g	ALPR3	H620	
18	<i>Amelanchier alnifolia v alnifolia</i>	western serviceberry	1		s	AMALA	H208	
19	<i>Amsinckia menziesii</i>	small-flowered fiddleneck	1		a	AMME	H386	
20	<i>Angelica arguta</i>	sharp-tooth angelica	4		p	ANAR3	H320	
21	<i>Antennaria anaphaloides</i>	tall pussytoes	4		p	ANAN2	H482	
22	<i>Antennaria dimorpha</i>	low pussytoes	3		p	ANDI2	H481	
23	<i>Antennaria luzuloides</i>	woodrush pussytoes	4		p	ANLU2	H482	
24	<i>Antennaria microphylla</i>	rosy pussytoes	2		p	ANMI3	H481	
25	<i>Antennaria racemosa</i>	raceme pussytoes	4		p	ANRA	H481	
26	<i>Antennaria umbrinella</i>	umber pussytoes	4		p	ANUM	H481	
27	<i>Apocynum androsaemifolium</i>	spreading dogbane	2		p	APAN2	H362	
28	<i>Apocynum sibiricum</i>	Indian hemp	3		p	APSI	H362	
29	<i>Arabis glabra</i>	tower mustard	4		a	ARGL	H152	
30	<i>Arabis holboellii</i>	rockcress	3		p	ARHO2	H155	
31	<i>Arabis microphylla</i>	littleleaf rockcress	3		p	ARMI	H153	
32	<i>Arceuthobium campylopodium</i>	dwarf mistletoe	3		p	ARCA3	H77	
33	<i>Arceuthobium douglasii</i>	dwarf mistletoe	3		p	ARDO	H77	
34	<i>Arctium minus</i>	common burdock	1	A	p	ARMI2	H483	
35	<i>Arctostaphylos uva-ursi</i>	kinnikinnick	4		p	ARUV	H342	
36	<i>Arenaria capillaris</i>	thread-leaved sandwort	4		p	ARCA7	H113	
37	<i>Arenaria (Moeringia) lateriflora</i>	bluntleaf sandwort	3		p	ARLA15	H111	
38	<i>Arenaria serpyllifolia</i>	thyme-leaved sandwort	3		a	ARSE2	H111	
39	<i>Arnica cordifolia</i>	heartleaf arnica	3		p	ARCO9	H485	
40	<i>Arnica sororia</i>	twin arnica	2		p	ARSO2	H485	
41	<i>Arrhenatherum elatius</i>	oatgrass	4	A	g	AREL3	H622	
42	<i>Artemisia campestris ssp borealis</i>	Pacific sagebrush	4		p	ARCAB2	H487	T&E?
43	<i>Artemisia cana</i>	silver sagebrush	4		p	ARCA13	H488	
44	<i>Artemisia dranunculus</i>	tarragon	1	A	p	ARDR4	H487	
45	<i>Artemisia frigida</i>	fringed sagebrush	1		s	ARFR4	H487	
46	<i>Artemisia ludoviciana var latiloba</i>	prairie sage	5		p	ARAB3	H486	
47	<i>Artemisia michauxiana</i>	Michaux artemisia	4		s	ARMI4	H486	
48	<i>Artemisia tridentata</i>	big sagebrush	2		s	ARTR2	H488	
49	<i>Asclepias speciosa</i>	showy milkweed	3		p	ASSP	H363	
50	<i>Asparagus officinalis</i>	asparagus	4	A	a	ASOF	H685	
51	<i>Asperugo procumbens</i>	catchweed	3	A	a	ASPR	H387	
52	<i>Aster campestris</i>	western meadow aster	4		p	ASCA6	H491	
53	<i>Aster conspicuus</i>	showy aster	2		p	ASCO3	H491	
54	<i>Aster foliaceus</i>	leafy aster	3		p	ASFO	H493	
55	<i>Aster modestus</i>	great northern aster	3		p	ASMO3	H492	not in bloom at first ID, needs confirmed; clasping lvs, in swamp

56	<i>Astragalus agrestis</i>	purple milkvetch	2		p	ASAG2	H234	
57	<i>Astragalus canadensis</i> var <i>brevidens</i>	Canada milkvetch	3		p	ASCAB	H231	
58	<i>Astragalus miser</i>	weedy milkvetch	2		p	ASMI9	H231	
59	<i>Astragalus purshii</i>	woolly-pod milkvetch	2		p	ASPU9	H238	
60	<i>Astragalus robbinsii</i>	Robbin's milkvetch	5		p	ASRO	H251	
61	<i>Athyrium filix-femina</i>	lady-fern	5		f	ATFI	H49	
62	<i>Atriplex canescens</i>	hoary saltbush	5		s	ATCA2	H95	
63	<i>Atriplex patula</i> var <i>patula</i>	spear orache	4		a	ATPAP	H95	
64	<i>Avena fatua</i>	wild oats		A				
65	<i>Balsamorhiza sagittata</i>	arrowleaf balsamroot	1		p	BASA3	H495	
66	<i>Barbarea orthoceras</i>	American wintercress	4		p	BAOR	H156	
67	<i>Berberis aquifolium</i>	hollyleaved barberry	1		s	BEAQ	H142	
68	<i>Berteroa incana</i>	berteroa	5	A	a	BEIN2	H156	
69	<i>Berula erecta</i>	cut-leaved water parsnip	3		p	BEER	H321	
70	<i>Betula occidentalis</i>	water birch	3		t	BEOC2	H73	
71	<i>Brodiaea douglasii</i>	dougies brodiaea	3		p	BRDO	H684	
72	<i>Bromus commutatus</i>	hairy brome	3	A	g	BRCO4	H625	
73	<i>Bromus inermis</i> var <i>inermis</i>	smooth brome	3	A	g	BRINI	H626	
74	<i>Bromus japonicus</i>	Japanese brome	4	A	g	BRJA	H625	
75	<i>Bromus tectorum</i>	cheatgrass	1	A	g	BRTTE	H624	
76	<i>Calamagrostis canadensis</i>	bluejoint reegrass	3		g	CACA4	H630	
77	<i>Calamagrostis rubescens</i>	pinegrass	3		g	CARU	H628	
78	<i>Callitriche heterophylla</i>	water starwort	3		p	CAHE3	H286	
79	<i>Calochortus lyallii</i>	Lvall's Mariposa lily	4		p	CALY	H687	
80	<i>Calochortus macrocarpus</i>	sagebrush Mariposa lily	3		p	CAMA5	H686	
81	<i>Camassia quamash</i>	blue camas						Found by Kathleen Swedberg May 2005
82	<i>Camelina microcarpa</i>	falseflax	4	A	a	CAMI2	H157	
83	<i>Capsella bursa-pastoris</i>	shepherd's purse	4	A	a	CABU2	H157	
	<i>Caragana arborescens</i>	Siberian pea shrub	4	A	s	CAAR	NA	Misidentified - See <i>Colutea arborescens</i>
84	<i>Cardamine pennsylvanica</i>	Pennsylvania bittercress	3		a	CAAR18	H161	
85	<i>Cardaria draba</i>	whitetop	4	A	p	CADR	H159	
86	<i>Carex amplifolia</i>	big-leaf sedge	4		g	CAAM10	H583	
87	<i>Carex atherodes</i>	awned sedge	3		g	CAAT2	H580	
88	<i>Carex athrostachya</i>	slenderbeaked sedge	3		g	CAAT3	H592	
89	<i>Carex backii</i>	Back's sedge	4		g	CABA3	H582	
90	<i>Carex bebbii</i>	Bebb's sedge	3		g	CABE2	H595	
91	<i>Carex concinnoides</i>	northwest sedge	4		g	CACO11	H581	
92	<i>Carex deweyana</i>	Dewey's sedge	3		g	CADE9	H591	
93	<i>Carex diandra</i>	panicked sedge	4		g	CADI4	H590	
94	<i>Carex disperma</i>	two-seeded sedge	3		g	CADI6	H588	
95	<i>Carex douglasii</i>	Douglas' sedge	3		g	CADO2	H589	immature
96	<i>Carex filifolia</i>	thread-leaved sedge	3		g	CAFI	H579	
97	<i>Carex hoodii</i>	Hood's sedge	4		g	CAHO5	H590	
98	<i>Carex hystericina</i>	porcupine sedge	4		g	CAHY4	H581	
99	<i>Carex interior</i>	interior sedge	4		g	CAIN11	H591	
100	<i>Carex lanuginosa</i>	woolly sedge	3		g	CALA30	H582	
101	<i>Carex leporinella</i>	hare sedge	3		g	CALE9	H594	sm neat heads w narrow peri along creeks
102	<i>Carex leptalea</i>	bristle-stalked sedge	3		g	CALE10	H530	
103	<i>Carex microptera</i>	small-winged sedge	3		g	CAMI7	H594	
104	<i>Carex nebrascensis</i>	Nebraska sedge	4		g	CANE2	H587	
105	<i>Carex pachystachya</i>	thick-headed sedge	3		g	CAPA14	H594	
106	<i>Carex petasata</i>	Liddon's sedge	3		g	CAPE7	H593	
107	<i>Carex praegracilis</i>	clustered field sedge	3		g	CAPR5	H589	dark-headed sedge in alkaline flats, too small to ID fully 5.1
108	<i>Carex praticola</i>	meadow sedge	3		g	CAPR7	H594	
109	<i>Carex raynoldsii</i>	Raynold's sedge	5		g	CARA6	H584	
110	<i>Carex retrorsa</i>	retorse sedge	3		g	CARE4	H581	

111	Carex rossii	Ross sedge	3		g	CARO5	H582	
112	Carex scopulorum	rocky mountain sedge	3		g	CASC12	H588	
113	Carex stipata	sawbeak sedge	3		g	CAST5	H590	
114	Carex sychnocephala	many-headed sedge	4		g	CASY	H592	T,E,S - Rare Confirmed by P. Zika; Only known recent record for Wash. State;
115	Carex tenera	slender sedge	5		g	CATE	H595	T,E,S Rare
116	Carex utriculata	beaked sedge	3		g	CAUT	H581	
117	Carex vallicola	valley sedge	3		g	CAVA3	H589	T,E,S - Rare
118	Carex vulpinoidea	fox sedge	4		g	CAVU2	H590	
119	Castilleja miniata	scarlet Indian paintbrush	4		p	CAMI12	H420	
120	Castilleja thompsonii	yellow paintbrush	3		p	CATH4	H417	
121	Ceanothus velutinus	snowbrush ceanothus	3		s	CEVE	H290	
122	Centaurea diffusa	diffuse knapweed	2	A	b	CEDI3	H498	
123	Centaurea repens	Russian knapweed	2	A	p	CERE6	H499	
124	Cerastium vulgatum	common chickweed	3		p	CEVU	H114	
125	Ceratophyllum demersum, L.	"coon's tail" aka "hornwort"				CEDE4		Found in Conner Lake by D. Swedberg 2007
126	Chaenactis douglasii	hoary false-yarrow	3		p	CHDO	H500	
127	Cheilanthes gracilima	lace lipfern	4		f	CHGR	H50	
128	Chenopodium album	lambsquarters	3	A	a	CHAL7	H99	
129	Chenopodium hybridum	maple-leaved goosefoot	3	A	a	CHHY	H98	
130	Chimaphila umbellata	pipsissewa	4		p	CHUM	H343	
131	Chorispora tenella	purple cross-flower	3	A	a	CHTE2	H160	
132	Chrysothamnus naseosus	gray rabbitbrush	3		s	CHNA	H502	
133	Chrysothamnus viscidifloris	green rabbitbrush						Found by Dale Swedberg Oct 2003
134	Cinna latifolia	woodreed	4		g	CILA2	H632	
135	Circaea alpina	enchanter's nightshade	4		p	CIAL	H304	
136	Cirsium arvense	Canada thistle	1	A	p	CIAR4	H503	
137	Cirsium undulatum	wavy-leaved thistle	3		p	CIUN	H504	
138	Cirsium vulgare	bull thistle	4	A	a	CIVU	H503	
139	Clarkia pulchella	deer horn	4		p	CLPU	H305	
140	Clarkia rhomboidea	common clarkia	3		p	CLRH	H305	
141	Claytonia lanceolata	springbeauty	3		p	CLLA2	H105	
142	Clematis ligusticifolia	western white clematis	3		s	CLLI2	H128	
143	Collinsia parviflora	blue-eyed Mary	3		a	COPA3	H422	
144	Collomia grandiflora	large-flowered collomia	4		p	COGR4	H368	
145	Collomia linearis	narrow-leaf collomia	3		a	COLI2	H368	
146	Colutea arborescens	common bladder senna		A				P. Zika identified Caragana arborescens as Colutea arborescens
147	Convolvulus arvensis	field morning-glory	3	A	p	COAR4	H364	
148	Corallorhiza maculata	spotted coralroot	4		p	COMA4	H700	
149	Corallorhiza striata	striped coralroot	4		p	COST	H700	
150	Cornus stolonifera	redosier dogwood	3		s	COST4	H339	
151	Crataegus columbiana var columbiana	Columbia hawthorn	4		d	CRCOC	H210	
152	Crataegus douglasii	Douglas hawthorn	3		d	CRDO2	H209	
153	Crepis atribarba	slender hawksbeard	3		p	CRAT	H508	
154	Crepis occidentalis	western hawksbeard	3		p	CROC	H509	
155	Cuscuta approximata	dodder		A				In alfalfa field south of knob north of Headquarters
156	Cryptantha torreyana	Torrey's cryptantha	3		a	CRT04	H389	
157	Cynoglossum officinale	common houndstongue	1	A	b	CYOF	H390	
158	Cyperus aristatus	awned flatsedge	3		a	CYAR3	H596	
159	Cypripedium calceolus (parviflorum)	yellow lady's-slipper	5		p	CYCA	H701	T,E,S - threatened
160	Cypripedium montanum	mounain lady's-slipper	5		p	CYMO2	H701	
161	Cystopteris fragilis	brittle bladderfern	3		f	CYFR2	H50	
162	Dactylis glomerata	orchardgrass	3	A	g	DAGL	H633	

163	<i>Delphinium burkei</i>	meadow larkspur	4		p	DEBU	H131	
164	<i>Delphinium nuttallianum</i>	Nuttall's larkspur	4		p	DENU2	H132	
165	<i>Descurainia richardsonii</i> var <i>viscosa</i>	mountain tansymustard	3	A	a	DERIV2	H162	
166	<i>Descurainia richardsonii</i> var <i>sonnei</i>	mountain tansymustard	4	A	a	DERIS	H161	
167	<i>Descurainia sophia</i>	flixweed	4	A	a	DESO2	H161	
168	<i>Dianthus armeria</i>	grass pink		A			H114	Found by D. Swedberg June 2005
169	<i>Disporum hookeri</i>	Hooker fairybell	4		p	DIHO3	H690	
170	<i>Disporum trachycarpum</i>	Sierra fairybell	3		p	DITR2	H690	
171	<i>Dodecatheon cusickii</i>	sticky shootingstar	3		p	DOCU2	H352	
172	<i>Dodecatheon dentatum</i>	white shootingstar	4		p	DODE	H352	
173	<i>Dodecatheon pulchellum</i>	shiny shootingstar	4		p	DOPU	H353	
174	<i>Draba verna</i>	spring whitlowgrass	1		a	DRVE2	H163	
175	<i>Dracocephalum parviflorum</i>	American dragonhead	4		p	DRPA2	H401	
176	<i>Elaeagnus angustifolia</i>	Russian olive	3	A	d	ELAN	H302	
177	<i>Elaeagnus commutata</i>	silverberry	4		s	ELCO	H302	
178	<i>Eleocharis bella</i>	delicate spike-rush	3		g	ELBE	H598	
179	<i>Eleocharis palustris</i>	common spike-rush	3		g	ELPA3	H598	
180	<i>Eleocharis rostellata</i>	beaked spike-rush	5		g	ELRO2	H597	T,E,S - Rare
181	<i>Elodea canadensis</i>	Canada waterweed	3		aq	ELCA7	H560	
182	<i>Elymus cinereus</i>	great basin wild rye	3		g	ELCI2	H637	
183	<i>Elymus glaucus</i>	blue wild rye	3		g	ELGL	H638	
184	<i>Epilobium angustifolium</i>	fireweed	3		p	EPAN2	H306	
185	<i>Epilobium minutum</i>	small-flowered willow-herb	4		a	EPMI	H306	
186	<i>Epilobium palustre</i>	swamp willow-herb	4		p	EPPA	H307	
187	<i>Equisetum arvense</i>	field horsetail	3		p	EQAR	H449	
188	<i>Equisetum fluviatile</i>	water horsetail	3		p	EQFL	H43	
189	<i>Equisetum hyemale</i>	common scouring-rush	3		p	EQHY	H43	
190	<i>Equisetum laevigatum</i>	smooth scouring-rush	3		p	EQLA	H43	
191	<i>Equisetum pratense</i>	shady horsetail	3		p	EQPR	H43	
192	<i>Erigeron corymbosus</i>	long-leaf fleabane	3		p	ERCO5	H519	
193	<i>Erigeron divergens</i>	spreading fleabane	4		p	ERDI4	H519	
194	<i>Erigeron filifolius</i>	thread-leaf fleabane	3		p	ERFI2	H518	
195	<i>Erigeron linearis</i>	desert yellow daisy	3		p	ERLI	H517	
196	<i>Erigeron philadelphicus</i>	philadelphia fleabane	3		p	ERPH	H515	
197	<i>Erigeron pumilus</i>	shaggy fleabane	3		p	ERPU2	H520	
198	<i>Erigeron speciosus</i>	showy fleabane	3		p	ERSP4	H515	
199	<i>Erigeron subtrinervis</i>	three-veined fleabane	4		p	ERSU2	H515	
200	<i>Eriogonum heracleoides</i>	big buckwheat	1		s	ERHE2	H80	
201	<i>Eriogonum niveum</i>	snow buckwheat	3		p	ERNI2	H83	
202	<i>Erucastrum gallicum</i>	dog mustard	4	A	a	ERGA	H167	
203	<i>Euphorbia serpyllifolia</i>	thyme-leaved spurge	4	A	a	EUSE5	H285	
204	<i>Festuca (Vulpia) bromoides</i>	six-weeks fescue	3	A	g	FEBR4.	H640	
205	<i>Festuca campestris</i>	rough fescue	3		g	FECA4	D154	a bunching meadowgrass in largest upper westside unit
206	<i>Festuca idahoensis</i>	Idaho fescue	2		g	FEID	H642	
207	<i>Festuca (Vulpia) octoflora</i>	slender fescue	3		g	FEOC3	H640	
208	<i>Festuca ovina</i>	sheep fescue	2		g	FEOV	H642	
209	<i>Festuca subulata</i>	bearded festuca	3		g	FESU	H641	
210	<i>Festuca trachyphylla</i>	hard fescue	4		g	FETR3	D162	on low side of water dam/flume at outlet of Conners Lake
211	<i>Fragaria virginiana</i>	wild strawberry	3		p	FRVI	H211	
212	<i>Fritillaria pudica</i>	yellowbell	3		p	FRPU2	H691	
213	<i>Gaillardia aristata</i>	blanket-flower	4		p	GAAR	H521	
214	<i>Galium bifolium</i>	low mountain bedstraw	3		a	GABI	H449	
215	<i>Galium boreale</i>	northern bedstraw	4		p	GABO2	H449	
216	<i>Galium triflorum</i>	fragrant bedstraw	3		p	GATR3	H449	
217	<i>Gayophytum diffusum</i>	spreading groundsmoke	4		a	GADI2	H309	
218	<i>Geranium robertianum</i>	Robert geranium	4	A	a	GERO	H280	

219	<i>Geranium viscosissimum</i>	sticky geranium	4		p	GEVI2	H280	
220	<i>Geum aleppicum</i>	yellow avens	3		p	GEAL3	H212	
221	<i>Geum macrophyllum</i>	large-leaved avens	3		p	GEMA4	H212	
222	<i>Geum triflorum</i>	prairie smoke avens	3		p	GETR	H212	
223	<i>Gilia aggregata</i>	scarlet gilia	3		p	GIAG	H369	
224	<i>Glyceria elata</i>	tall mannagrass	3		g	GLEL	H644	
225	<i>Glyceria striata</i>	fowl mannagrass	3		g	GLST	H643	
226	<i>Gnaphalium microcephalum</i>	slender cudweed	3		p	GNMI	H523	
227	<i>Gnaphalium palustre</i>	lowland cudweed	3		p	GNPA	H522	
228	<i>Gratiola neglecta</i>	hedge hssop	4		p	GRNE	H424	
229	<i>Gymnocarpium dryopteris</i>	oak fern	4		f	GYDR	H51	
230	<i>Gypsophila paniculata</i>	baby's breath	5	A	p	GYP A	H114	
231	<i>Habenaria hyperborea</i>	green bog-orchid	4		p	HAHY3	H704	
232	<i>Habenaria unalascensis</i>	Alaska rein-orchid	4		p	HAUN	H702	
233	<i>Hackelia ciliata</i>	Okanogan stickseed	3		p	HACI4	H392	
234	<i>Hackelia deflexa</i>	nodding stickseed	3		a	HADE	H392	
235	<i>Hackelia micrantha</i>	blue stickseed	3		p	HAMI	H392	in forest near Sinlahekin Ck/Blue Lk area
236	<i>Happlopappus carthamoides</i>	Columbia goldenweed	3		p	HACA5	H526	
237	<i>Heracleum lanatum</i>	cow parsnip	3		p	HELA4	H325	
238	<i>Heuchera cylindrica</i>	roundleaf alumroot	3		p	HECY2	H187	
239	<i>Hieracium albiflorum</i>	white-flowered hawkweed	3		p	HIAL2	H531	
240	<i>Hieracium cynoglossoides</i>	houndstongue hawkweed	3		p	HICY	H531	
241	<i>Hippuris vulgaris</i>	mare's-tail	3		aq	HIVU2	H313	
242	<i>Holodiscus discolor</i>	oceanspray	3		s	HODI	H213	
243	<i>Hordeum jubatum</i>	squirrel-tail	3		g	HOJU	H646	
244	<i>Hydrophyllum capitatum</i>	ballhead waterleaf	3		p	HYCA4	H378	
	<i>Hyoscyamus niger</i>							Pasture E & NE of HQ; along fence N of parking lot; old bldg S of Doheny
245		black henbane		A				
246	<i>Hypericum perforatum</i>	St. John's-wort	3	A	p	HYPE	H295	
247	<i>Iliamna rivularis</i>	streambank globemallow	4		p	ILRI	H292	
248	<i>Iris pseudacorus</i>	yellow iris	5	A	p	IRPS	H697	
249	<i>Iva xanthifolia</i>	tall marsh-elder	3	A	a	IVXA	H533	
250	<i>Juncus articulatus</i>	jointed rush	3		g	JUAR4	H572	
251	<i>Juncus balticus</i>	Baltic rush	3		g	JUBA	H569	
252	<i>Juncus bufonius</i>	toad rush	3		g	JUBU	H568	
253	<i>Juncus effusus</i>	common rush	3		g	JUEF	H569	
254	<i>Juncus ensifolius</i>	dagger-leaved rush	4		g	JUEN	H570	
255	<i>Juncus longistylis</i>	long-styled rush	3		g	JULO	H574	
256	<i>Juncus torreyi</i>	Torrey's rush	4		g	JUTO	H571	
257	<i>Juniperus communis</i>	common juniper	3		s	JUCO6	H58	
258	<i>Juniperus scopulorum</i>	Rocky Mountain juniper	5		t	JUSC2	H58	
259	<i>Kochia scoparia</i>	red belvedere	3	A	a	KOSC	H100	
260	<i>Koeleria cristata</i>	Junegrass	3		g	KOCR	H647	
261	<i>Lactuca pulchella</i>	blue lettuce	4		p	LAPU	H534	
262	<i>Lactuca serriola</i>	willow lettuce	3	A	a	LASE	H534	
263	<i>Lappula echinata</i>	European stickseed	3	A	a	LAEC	H393	
264	<i>Lappula redowskii</i>	western stickseed	3	A	a	LARE	H393	
265	<i>Larix occidentalis</i>	Western larch	4		c	LAOC	H61	
266	<i>Lathyrus ochroleucus</i>	cream-flowered peavine	3		p	LAOC2	H263	
267	<i>Lemna minor</i>	duckweed	3		aq	LEMI3	H677	
268	<i>Lepidium densiflorum</i>	prairie peppergrass	4		a	LEDE	H171	
269	<i>Lepidium perfoliatum</i>	clasping peppergrass	3		a	LEPE2	H169	
270	<i>Leptodactylon pungens</i>	prickly phlox	3		p	LEPU	H371	
271	<i>Lesquerella douglasii</i>	Columbia bladderpod	3		p	LEDO2	H172	
272	<i>Lewisia rediviva</i>	bitterroot	3		p	LERE7	H106	
273	<i>Ligusticum grayi</i>	Gray's lovage	3		p	LIGR	H327	
274	<i>Lilium columbianum</i>	tiger lily	3		p	LICO	H692	
275	<i>Linaria dalmatica</i> ssp <i>dalmatica</i>	Dalmatian toadflax	4	A	p	LIDAD	H424	
276	<i>Linnaea borealis</i>	twinflower	4		p	LIBO3	H451	

277	<i>Linum perenne</i>	blue flax	3		p	LIPEL	H282
278	<i>Lithophragma bulbifera</i>	fringecup	2		a	LIBU2	H189
279	<i>Lithophragma parviflorum</i>	fringecup	2		a	LIPA5	H190
280	<i>Lithospermum arvense</i>	corn gromwell	4		a	LIAR4	H394
281	<i>Lithospermum ruderale</i>	western gromwell	3		p	LIRU4	H394
282	<i>Lomatium ambiguum</i>	swale desert parsley	3		p	LOAM	H328
283	<i>Lomatium dissectum</i>	wild carrot	4		p	LODI	H330
284	<i>Lomatium macrocarpum</i>	largefruit desert parsley	3		p	LOMA3	H333
285	<i>Lomatium triternatum</i>	nine-leaf lomatium`	3		p	LOTR2	H327
286	<i>Lonicera involucrata</i>	black twinberry	3		s	LOIN5	H451
287	<i>Lonicera tartarica</i>	tartarian honeysuckle	4	A	p	LOTA	NA
288	<i>Lonicera utahensis</i>	red twinberry	4		s	LOUT2	H451
289	<i>Lupinus leucophyllus</i> var <i>leucophyllus</i>	velvet lupine	3		p	LULEL4	H267
290	<i>Lupinus polyphyllus</i>	many-leaved lupine	4		p	LUP02	H269
291	<i>Lupinus sericeus</i>	silky lupine	2		p	LUSE4	H266
292	<i>Lychnus alba</i> aka <i>Silene alba</i>	white campion aka white cockle	4	A	p	LYAL	H115
293	<i>Lycium halimifolium</i>	matrimony vine	4	A	p	LYHA	H411
294	<i>Lycopus americanus</i>	bugleweed	3		p	LYAM	H403
295	<i>Lycopus asper</i>	rough bungleweed	3		p	LYAS	H403
296	<i>Lysimachia ciliata</i>	fringed loosestrife	4		p	LYCI	H354
297	<i>Lysimachia thyrisiflora</i>	tufted loosestrife	4		p	LYTH2	H354

North side Fish Lake on shore near campground on DNR owned portion; on Sinlahekin Creek north side Cecile Crk Bridge

298	<i>Lythrum salicaria</i>	purple loosestrife		A			
299	<i>Madia exigua</i>	little tarweed	3		a	MAEX	H538
300	<i>Madia gracilis</i>	common tarweed	3		a	MAGR3	H538
301	<i>Madia sativa</i>	Chilie tarweed	4		a	MASA	H538
302	<i>Malva neglecta</i>	dwarf mallow	4	A	a	MANE	H292
303	<i>Matricaria matricarioides</i>	pineapple weed	3	A	a	MAMA11	H540
304	<i>Medicago lupulina</i>	black medic	3	A	p	MELU	H269
305	<i>Medicago sativa</i>	alfalfa	3	A	p	MESA	H269
306	<i>Melica bulbosa</i>	oniongrass	3		g	MEBU	H649
307	<i>Melilotus alba</i>	white clover	3	A	b	MEAL2	H270
308	<i>Melilotus officinalis</i>	yellow clover	3	A	b	MEOF	H270
309	<i>Mentha arvensis</i>	Canadian mint	3		p	MEAR4	H404
310	<i>Mentha piperita</i>	peppermint	4		p	MEPI	H405
311	<i>Mentzelia albicaulis</i>	white-stemmed mentzelia	4		a	MEAL6	H300
312	<i>Mentzelia dispersa</i>	small-flowered mentzelia	3		a	MEDI	H300
313	<i>Mertensia longiflora</i>	bluebells	3		p	MELO4	H395
314	<i>Microseris nutans</i>	nodding microseris	3		p	MINU	H540
315	<i>Microseris troximoides</i>	false agoseris	4		p	MITR5	H540
316	<i>Microsteris gracilis</i>	pink-eyed Mary	3		a	MIGR	H372
317	<i>Mimulus floribundis</i>	sticky monkeyflower	4		a	MIFL2	H427
318	<i>Mimulus guttatus</i>	yellow monkeyflower	3		p	MIGU	H427
319	<i>Mitella pentandra</i>	alpine mitrewort	4		p	MIPE	H190
320	<i>Mitella trifida</i>	three-tooth mitella	4		p	MITR4	H191
321	<i>Montia linearis</i>	narrow-leaved montia	3		a	MOLI4	H107
322	<i>Montia sibirica</i>	Siberian miner's lettuce	3		a	MOSI2	H108
323	<i>Myosotis arvensis</i>	field forget-me-not	3	A	a	MYAR	H396
324	<i>Myosotis laxa</i>	small-flowered forget-me-not	3		p	MYLA	H395
325	<i>Myosotis micrantha</i>	blue forget-me-not	4		p	MYMI	H396
326	<i>Myosurus aristatus</i>	sedge mouse-tail	4		a	MYAR3	H133
327	<i>Myriophyllum spicatum</i>	Eurasian water-milfoil	3	A	aq	MYSP2	H313
328	<i>Nemophila breviflora</i>	Great Basin nemophila	3		a	NEBR	H379
329	<i>Nepeta cataria</i>	catnip	3	A	p	NECA2	H405

Found by D. Swedberg July 2006 end of HQ driveway and Sinlahekin

330 *Oenothera villosa* yellow evening primrose

OPFR is a R1 plant;
T,E,S, - Rare

331	<i>Opuntia fragilis</i>	brittle cholla	3		p	OPFR	H301	
332	<i>Orobanche uniflora</i>	naked broomrape	5		p	ORUN	H444	
333	<i>Osmorhiza chilensis</i>	mountain sweet-cicely	3		p	OSCH	H335	
334	<i>Pachistima myrsinites</i>	pachistima	3		s	PAMY	H288	
335	<i>Panicum capillare</i>	common witchgrass	3		A	g	PACA6	H653
336	<i>Parthenocissus vitacea</i>	Virginia creeper	4		A	p	PAVI5	NA
337	<i>Pastinaca sativa</i>	parsnip	4		A	b	PASA2	H335
338	<i>Pectocarya linearis</i>	winged combseed	3			a	PELIP2	H396
339	<i>Pedicularis bracteosa</i>	bracted lousewort	3			p	PEBR	H430
340	<i>Penstemon confertus</i>	yellow penstemon	3			p	PECO6	H437
341	<i>Penstemon fruticosus</i>	shrubby penstemon	3			p	PEFR3	H433
342	<i>Penstemon pruinosus</i>	Chelan penstemon	3			p	PEPR3	H440
343	<i>Penstemon richardsonii</i>	Richardson's penstemon	4			p	PERI	H434
344	<i>Perideridia gairdneri</i>	Gairdner's yampha	3			p	PEGA3	H336
345	<i>Phacelia glandulifera</i>	sticky phacelia	3		A	a	PHGL2	H382
346	<i>Phacelia hastata</i>	silverleaf phacelia	3			p	PHHA	H381
347	<i>Phacelia linearis</i>	threadleaf phacelia	3			a	PHLI	H382
348	<i>Phalaris arundinacea</i>	reed canarygrass	2		A	g	PHAR3	H654
349	<i>Philadelphus lewisii</i>	Lewis' mockorange	3			s	PHLE4	H204
350	<i>Phleum pratense</i>	timothy	3		A	g	PHPR3	H655
351	<i>Phlox longifolia</i>	long-leaved phlox	3			p	PHLO2	H374
352	<i>Physocarpus malvaceus</i>	mallow ninebark	4			s	PHMA5	H216
353	<i>Picea engelmannii</i>	Engelmann's spruce	4			t	PIEN	H61
354	<i>Pinus contorta</i>	lodgepole pine	5			t	PICO	H62
355	<i>Pinus ponderosa</i>	ponderosa pine	1			t	PIPO	H62
356	<i>Plagiobothrys scouleri</i> var <i>scouleri</i>	Scouler's popcornflower	3			a	PLSCS	H397
357	<i>Plagiobothrys tenellus</i>	slender popcorn flower	3			a	PLTE	H397
358	<i>Plantago lanceolata</i>	narrowleaf plantain	3		A	p	PLLA	H447
359	<i>Plantago major</i>	common plantain	3		A	p	PLMA2	H447
360	<i>Plantago patagonica</i>	Indian wheat	3			a	PLPA2	H447
361	<i>Plectritis macrocera</i>	white plectritis	3			a	PLMA4	H454
362	<i>Poa annua</i>	annual bluegrass	4		A	a	POAN	H656
363	<i>Poa bulbosa</i>	bulbous bluegrass	1		A	a	POBU	H658
364	<i>Poa compressa</i>	Canada bluegrass	3		A	p	POCO	H657
365	<i>Poa nevadensis</i>	Nevada bluegrass	3			p	PONE3	H663
366	<i>Poa palustris</i>	lake bluegrass	3			p	POPA2	H660
367	<i>Poa pratensis</i>	Kentucky bluegrass	3		A	g	POPR	H661
368	<i>Poa secunda</i>	Sandberg bluegrass	3			g	POSE	H663
369	<i>Polygonum amphibium</i>	water ladysthumb	3			aq	POAM8	H90
370	<i>Polygonum aviculare</i>	doorweed	3		A	a	POAV	H88
371	<i>Polygonum convolvulus</i>	bindweed	3		A	a	POCO10	H85
372	<i>Polygonum lapathifolium</i>	willow weed	3			p	POLA4	H87
373	<i>Polygonum majus</i>	wiry knotweed	3			p	POMA9	H87
374	<i>Polygonum sawatchense</i>	sawatch knotweed	4			a	POSA17	H88
375	<i>Polygonum ramosissimum</i>	yellow-flowered knotweed	3			a	PORA3	H86
376	<i>Polypodium hesperium</i>	licorice fern	4			f	POHE3	H50
377	<i>Populus tremuloides</i>	quaking aspen	3			t	POTR5	H64
378	<i>Populus trichocarpa</i>	black cottonwood	3			d	POTR15	H64
379	<i>Potamogeton friesii</i>	flat-stalked potamogeton	3			aq	POFR3	H564
380	<i>Potamogeton natans</i>	floating-leaved potamogeton	3			aq	PONA4	H565
381	<i>Potamogeton pectinatus</i>	fennel-leaved pondweed	3			aq	POPE6	H563
382	<i>Potentilla anserina</i>	silverweed	3			p	POAN5	H216
383	<i>Potentilla argentea</i>	silvery cinquefoil	3		A	p	POAR8	H220
384	<i>Potentilla biennis</i>	biennial cinquefoil	3			a	POBI7	H218
385	<i>Potentilla glandulosa</i>	sticky cinquefoil	3			p	POGL9	H216
386	<i>Potentilla gracilis</i> var <i>flabelliformis</i>	soft cinquefoil	3			p	POGRF	H218

upright in wetlands, collar
for stipules

387	<i>Potentilla norvegica</i>	Norwegian cinquefoil	4	A	p	PONO3	H217	
388	<i>Potentilla rivalis</i>	brook cinquefoil	4		p	PORI3	H218	
389	<i>Prunus armeniaca</i>	apricot	5	A	t	PRAR3	NA	
390	<i>Prunus besseyi</i>	Western sandcherry	3	A	s	PRBE	NA	
391	<i>Prunus emarginata</i>	bittercherry	3		s	PREM	H221	
392	<i>Prunus virginiana</i>	common chokecherry	3		s	PRVI	H221	
393	<i>Pseudotsuga menziesii</i>	Douglas fir	1		t	PSME	H63	
394	<i>Pteridium aquilinum</i>	bracken fern	3		f	PTAQ	H54	
395	<i>Pterospora andromedea</i>	pinedrops	4		p	PTAN2	H347	
397	<i>Purshia tridentata</i>	antelope bitterbrush	1		s	PUTR2	H222	
398	<i>Pyrola chlorantha</i>	green wintergreen	4		p	PYCH	H348	
396	<i>Pyrola minor</i>	lesser wintergreen	5		p	PYMI	H347	
399	<i>Pyrola asarifolia</i>	pink wintergreen	4		p	PYAS	H348	
400	<i>Pyrola secunda</i>	sidebells pyrola	3		p	PYSE	H347	
401	<i>Pyrola uniflora</i>	woodnymph	4		p	PYUN	H347	
402	<i>Pyrus malus</i>	cultivated apple	5	A	t	PYMA	H222	
403	<i>Ranunculus aquatilis</i>	white water buttercup	3		p	RAAQ	H136	
404	<i>Ranunculus flabellaris</i>	yellow water buttercup	3		p	RAFL	H137	
405	<i>Ranunculus glaberrimus</i>	sage buttercup	3		p	RAGL	H137	
406	<i>Ranunculus pennsylvanicus</i>	bristly buttercup	4		p	RAPE2	H140	
407	<i>Ranunculus repens</i> var <i>repens</i>	creeping buttercup	3	A	p	RARER	H139	
408	<i>Ranunculus sceleratus</i>	celery-leaved buttercup	3		p	RASC3	H136	
409	<i>Ranunculus testiculatus</i>	hornseed buttercup	4	A	a	RATE	H134	
410	<i>Rheum rhaponticum</i>	rhubarb	5	A	p	RHRH	NA	
411	<i>Rhinanthus crista-galli</i>	rattlebox	4		a	RHCR2	H440	
412	<i>Rhus (Toxicodendron) diversiloba</i>	poison ivy	3		s	RHDI6	H287	
413	<i>Rhus glabra</i>	western sumac	3		s	RHGL	H287	
414	<i>Ribes aureum</i>	golden currant	4		s	RIAU	H202	
415	<i>Ribes cereum</i>	wax currant	3		s	RICE	H202	
416	<i>Ribes hudsonianum</i>	stinking currant	3		s	RIHU	H203	
417	<i>Ribes inerme</i>	whitestem gooseberry	5		s	RIIN2	H201	
418	<i>Ribes lacustre</i>	swamp currant	3		s	RILA	H200	
419	<i>Ribes sativum</i>	red currant	5	A	s	RISA2	H203	
420	<i>Ribes viscosissimum</i>	sticky currant	4		s	RIVI3	H202	
421	<i>Robinia pseudoacacia</i>	black locust		A				Near bunkhouse at Headquarters in shallow water in Doheney Lake
422	<i>Rorippa islandica</i>	marsh yellowcress	4		aq	ROIS	H175	
423	<i>Rorippa nasturtium-aquaticum</i>	water-cress	3	A	aq	RONA2	H17	
424	<i>Rorippa obtusa</i>	bluntleaved yellowcress	4		a	ROOB	H174	along edge of Blue Lake
425	<i>Rosa eglantheria</i>	sweetbriar	3	A	s	ROEG	H223	
426	<i>Rosa nutkana</i>	Nootka rose	3		s	RONU	H224	
427	<i>Rosa woodsii</i>	Woods' rose	4		s	ROWO	H223	
428	<i>Rubus idaeus</i>	red raspberry	3		s	RUID	H226	
429	<i>Rubus leucodermis</i>	black raspberry	4		s	RULE	H226	
430	<i>Rubus parviflorus</i>	thimbleberry	3		s	RUPA	H224	
431	<i>Rumex acetosella</i>	sheep sorrel	3	A	a	RUAC3	H91	
432	<i>Rumex crispus</i>	curly dock	2	A	p	RUCR	H92	
433	<i>Rumex occidentalis</i>	western dock	3		p	RUOC3	H92	
434	<i>Salix alba</i> var <i>vitellina</i>	golden willow	3	A	t	SAALV2	H66	
435	<i>Salix amygdaloides</i>	peach-leaf willow	3		t	SAAM2	H66	
436	<i>Salix bebbiana</i>	Bebb willow	3		s	SABE2	H71	
437	<i>Salix exigua</i>	coyote willow	3		s	SAEX	H67	
438	<i>Salix geyeriana</i>	Geyer's willow	3		s	SAGE2	H70	
439	<i>Salix maccalliana</i>	MacCall's willow	5		s	SAMA12	D36	T,E,S - Rare
440	<i>Salix rigida</i> var <i>mackenzieana</i>	Mackenzie willow	3		s	SARIM4	L69	
441	<i>Salix scouleriana</i>	Scouler's willow	2		s	SASC	L70	
442	<i>Salsola kali</i>	Russian thistle	3	A	a	SAKA	H101	
443	<i>Sambucus cerulea</i>	blue elderberry	3		s	SACE3	H452	
444	<i>Sambucus racemosa</i>	red elderberry	5		s	SARA2	H452	
445	<i>Sanguisorba minor</i>	burnet	4	A	a	SAMI3	H226	

446	<i>Sanicula crassicaulis</i>	Pacific sanicle	4		p	SACR2	H337	
447	<i>Sanicula marilandica</i>	black snake-root	5		p	SAMA2	H337	T,E,S - Rare
448	<i>Saponaria officinalis</i>	bouncing bett	3	A	p	SAOF4	H116	
449	<i>Saxifraga arguta</i>	brook saxifrage	3		p	SAAR13	H185	
450	<i>Saxifraga integrifolia</i> var <i>leptolepala</i>	swamp saxifrage	3		p	SAINL2	H197	
451	<i>Saxifraga occidentalis</i> var <i>idahoensis</i>	western saxifrage	3		p	SAOCI	H195	
452	<i>Saxifraga occidentalis</i> var <i>occidentalis</i>	western saxifrage	3		p	SAOCO	H196	
453	<i>Schoenocrambe linifolia</i>	plainsmustard	4		p	SCLI	H176	
454	<i>Scirpus acutus</i>	bulrush	3		p	SCAC	H601	
455	<i>Scirpus microcarpus</i>	panicked bulrush	3		p	SCMI2	H602	
456	<i>Scirpus olneyi</i>	Olney's bulrush	4		p	SCOL	H601	
457	<i>Scutellaria galericulata</i>	marsh skullcap	4		p	SCGA	H408	
458	<i>Sedum lanceolatum</i>	spearleaf stonecrop	3		p	SELA	H183	
459	<i>Selaginella densa</i>	compact clubmoss	3		cm	SEDE2	H41	
460	<i>Senecio indecorus</i>	rayless mountain butterweed	3		p	SEIN	H547	
461	<i>Senecio integerrimus</i>	western butterweed	3		p	SEIN2	H548	
462	<i>Senecio pauperculus</i>	Canada butterweed	3		p	SEPA5	H547	
463	<i>Setaria lutescens</i>	yellow bristlegrass	3	A	g	SELU4	H667	
464	<i>Shepherdia canadensis</i>	buffaloberry, soopolallie	3		s	SHCA	H450	Coetaneous, axial flowers 3.10.03
465	<i>Silene antirrhina</i>	sleepy cat	5	A	p	SIAN2	H117	
466	<i>Silene conoidea</i>	conoid catchfly	4		p	SICO4	H117	
467	<i>Silene douglasii</i>	Douglas silene	3		p	SIDO	H119	
468	<i>Silene latifolia</i>	bladder campion		A				
469	<i>Silene menziesii</i>	Menzie's silene	3		p	SIME	H118	
470	<i>Sisymbrium altissimum</i>	tall tumbledustard	3	A	a	SIAL2	H176	
471	<i>Sisymbrium loeselii</i>	Loesel tumbledustard	3	A	a	SILO3	H176	
472	<i>Sitanion hystrix</i>	squirreltail	3		g	SIHY	H668	
473	<i>Sium suave</i>	hemlock water-parsnip	3		p	SISU2	H338	
474	<i>Smilacina racemosa</i>	raceme Solomon's seal	3		p	SMRA	H693	
475	<i>Smilacina stellata</i>	star-flowered Solomon's seal	3		p	SMST	H693	
476	<i>Solanum dulcamara</i>	bittersweet nightshade	1	A	p	SODU	H412	
477	<i>Solidago canadensis</i>	goldenrod	3		p	SOCA6	H549	
478	<i>Sonchus arvensis</i>	perennial sowthistle	3	A	p	SOAR2	H551	
479	<i>Sparganium emersum</i>	simple-stem bur-reed	3		aq	SPEM2	H675	
480	<i>Spiraea betulifolia</i>	white spirea	3		s	SPBE2	H227	
481	<i>Sporobolus cryptandrus</i>	sand dropseed	3		g	SPCO4	H670	
482	<i>Stachys sp</i>	hedge-nettle	4		p	STACH	H408	Ig soft furry Labiatae at edge of wetland below Forde Lake
483	<i>Stellaria calycantha</i>	northern starwort	3		p	STCA	H122	
484	<i>Stellaria longipes</i>	long-stalk starwort	3		p	STLO2	H121	
485	<i>Stellaria media</i>	chickweed	3	A	a	STME2	H121	
486	<i>Stellaria nitens</i>	shining chickweed	3		a	STNI	H121	
487	<i>Stephanomeria tenuifolia</i>	rush-pink	4		p	STTE2	H552	
488	<i>Stipa comata</i>	needle and thread grass	3		g	STCO4	H671	
489	<i>Stipa occidentalis</i>	western needlegrass	3		g	STOC2	H671	
490	<i>Streptopus amplexifolius</i>	twisted-stalk	4		p	STAM2	H694	
491	<i>Symphoricarpos albus</i>	common snowberry	2		s	SYAL	H453	
492	<i>Symphoricarpos oreophilis</i>	mountain snowberry	3		s	SYOR2	H453	
493	<i>Tamarix parviflora</i>	tamarisk aka saltcedar	5	A	s	TAPA4	H296	
494	<i>Taraxacum officinale</i>	common dandelion	1	A	b	TAOF	H553	
495	<i>Thalictrum occidentale</i>	western meadowrue	3		p	THOC	H140	
496	<i>Thlaspi arvense</i>	field pennycress	3	A	a	THAR5	H179	
497	<i>Tragopogon dubius</i>	yellow salsify	3	A	b	TRDU	H555	
498	<i>Trifolium pratense</i>	red clover	3	A	p	TRPR2	H277	
499	<i>Trifolium repens</i>	white clover	3	A	p	TRRE3	H276	
500	<i>Typha latifolia</i>	common cattail	3		p	TYLA	H676	
501	<i>Ulmus pumila</i>	Siberian elm	4	A	t	ULPU	H75	
502	<i>Urtica dioica</i>	stinging nettle	2		p	URDI	H76	
503	<i>Utricularia vulgaris</i>	bladderwort	3		aq	UTCA	H446	

504	<i>Vaccinium myrtillus</i>	low blueberry	4		p	VAMY2	H349
505	<i>Vaccinium scoparium</i>	grouseberry	4		p	VASC	H349
506	<i>Verbascum thapsus</i>	common mullein	2	A	b	VETH	H442
507	<i>Verbena bracteata</i>	bracted verbena	3	A	a	VEBR3	H398
508	<i>Veronica americana</i>	American brooklime	3		p	VEAM2	H443
509	<i>Veronica biloba</i>	bilobed speedwell	3		a	VEBI2	H443
510	<i>Veronica peregrina</i>	purslane speedwell	3		a	VEPE2	H443
511	<i>Vicia americana</i>	American vetch	3		p	VIAM	H279
512	<i>Vicia sativa</i>	common vetch	4	A	p	VISA	H279
513	<i>Viola adunca</i>	early blue violet	3		p	VIAD	H298
514	<i>Viola canadensis</i> var <i>rugulosa</i>	Canada violet	4		p	VICAR	H297
515	<i>Viola palustris</i>	marsh violet	3		p	VIPA4	H297
516	<i>Viola nuttallii</i> var <i>vallicola</i>	valley yellow violet	3		p	VINUV2	H299
517	<i>Vitus riparia</i>	riverbank grape-vine	5	A	p	VIRI	H291
518	<i>Woodsia oregana</i>	woodsia	4		f	WOOR	H55
519	<i>Woodsia scopulina</i>	Rocky Mountain woodsia	3		f	WOSC	H55
	<i>Zigadenus elegans</i>	elegant death-camas	4		p	ZIEL2	H696
	<i>Zigadenus venenosus</i>	meadow death-camas	2		p	ZIVE	H697

7j - Rare Vascular Plants

Name	Genus species	Conservation Status		
		State*	Federal**	Global***
Robbins' Milkvetch	<i>(Astragalus robbinsii)</i>			T5
Cordilleran carex	<i>(Carex cordillerana)</i>			G3
Many-headed sedge	<i>(Carex sychnocephala)</i>	Sensitive S2		G4
Slender sedge	<i>(Carex tenera)</i>			G5
Valley sedge	<i>(Carex vallicola)</i>	Sensitive S2		G5
Yellow lady's-slipper	<i>(Cypripedium parviflorum)</i>	Threatened S2		G5
Beaked spike-rush	<i>(Eleocharis rostellata)</i>	Sensitive S2		G5
Brittle prickly-pear cactus	<i>(Opuntia fragilis)</i>			G5
Maccall's willow	<i>(Salix maccalliana)</i>	S1		G5
Black snake-root	<i>(Sanicula marilandica)</i>	Sensitive S2		G5

***Federal Status definitions (as defined by USFWS):**

LE = Listed Endangered: Any taxon that is in danger of extinction throughout all or a significant portion of its range and that has been formally listed as such in the Federal Register under the Federal Endangered Species Act.

LT = Listed Threatened: Any taxon that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and that has been formally listed as such in the Federal Register under the Federal Endangered Species Act.

PE = Proposed Endangered: Any taxon that is in danger of extinction throughout all or a significant portion of its range and that has been proposed for listing as such in the Federal Register under the Federal Endangered Species Act.

PT = Proposed Threatened: Any taxon that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and that has been proposed for listing as such in the Federal Register under the Federal Endangered Species Act.

C = Candidate species: A taxon for which current information indicates the probable appropriateness of listing as Endangered or Threatened and that has been published in the Federal Register as a candidate for listing under the Federal Endangered Species Act.

SC = Species of Concern: A taxon whose conservation standing is of concern but for which status information is still needed. Species of concern lists are not published in the Federal Register.
NL = Not Listed: Used for animal populations or subspecies within a taxon that are not federally listed, when other populations or subspecies of that same taxon are listed.

****State Rank**

State rank characterizes the relative rarity or endangerment within the state of Washington. Factors including, but not limited to, number of known occurrences are considered when assigning a rank. Two codes together represent an inexact range (e.g., S1S2) or different ranks for breeding and non-breeding populations (e.g., S1B, S3N). Values and their definitions:

S1 = Critically imperiled in the state because of extreme rarity or other factors making it especially vulnerable to extirpation from the state. (Typically 5 or fewer occurrences or very few remaining individuals or acres)

S2 = Imperiled in the state because of rarity or other factors making it very vulnerable to extirpation from the state. (Typically 6 to 20 occurrences or few remaining individuals or acres)

S3 = Rare or uncommon in the state. (Typically 21 to 100 occurrences)

S4 = Widespread, abundant, and apparently secure in state, with many occurrences, but the taxon is of long-term concern. (Usually more than 100 occurrences)

S5 = Demonstrably widespread, abundant, and secure in the state; believed to be ineradicable under present conditions.

SA = Accidental in the state.

SE = An exotic species that has become established in the state.

SH = Historical occurrences only are known, perhaps not verified in the past 20 years, but the taxon is suspected to still exist in the state.

SNR or **S?** = Not yet ranked. Sufficient time and effort have not yet been devoted to ranking of this taxon.

SP = Potential for occurrence of the taxon in the state but no occurrences have been documented.

SR = Reported in the state but without persuasive documentation which would provide a basis for either accepting or rejecting the report (e.g., misidentified specimen).

SRF = Reported falsely in the state but the error persists in the literature.

SU = Unrankable. Possibly in peril in the state, but status is uncertain. More information is needed.

SX = Believed to be extirpated from the state with little likelihood that it will be rediscovered.

SZ = Not of conservation concern in the state.

Qualifiers are sometimes used in conjunction with the State Ranks described above:

B - Rank of the breeding population in the state.

N - Rank of the non-breeding population in the state.

B and N qualifiers are used to indicate breeding and non-breeding rank of migrant species whose non-breeding rank may be quite different from their breeding rank in the state (e.g., S1B, S4N for a very rare breeder that is a common winter resident).

? qualifier is used with numeric ranks to denote uncertainty; more information may be needed to assign a rank with certainty. The '?' qualifies the character it follows (e.g., SE? denotes uncertainty of exotic status).

SnSn Two codes (i.e., S1S2) are used to indicate a range of ranks.

*****Global Rank**

Global rank characterizes the relative rarity or endangerment of the element world-wide. Factors including, but not limited to, number of occurrences are considered when assigning a rank. Values and their definitions:

G1 = Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. (Typically 5 or fewer occurrences or very few remaining individuals or acres).

G2 = Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction throughout its range. (6 to 20 occurrences or few remaining individuals or acres).

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout its range. (21 to 100 occurrences)

G4 = Widespread, abundant, and apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery. Thus, the Element is of long-term concern. (Usually more than 100 occurrences)

G5 = Demonstrably widespread, abundant, and secure globally, though it may be quite rare in parts of its range, especially at the periphery.

GH = Historical occurrences only are known, perhaps not verified in the past 20 years, but the taxon is suspected to still exist somewhere in its former range.

GNR or **G?** = Not yet ranked. Sufficient time and effort have not yet been devoted to ranking of this taxon.

GU = Unrankable. Possibly in peril range-wide but status uncertain. More information is needed.

GX = Believed to be extinct and there is little likelihood that it will be rediscovered.

Qualifiers are used in conjunction with the Global Ranks described above:

T_n Where n is a number or letter similar to those for G_n ranks, above, but indicating subspecies or variety rank. For example, G3TH indicates a species that is ranked G3 with this subspecies ranked as historic.

Q = Questionable. Taxonomic status is questionable and the numeric rank may change with taxonomy.

? = The specified rank is uncertain; more information may be needed to assign a rank with certainty.

G_nG_n Two codes (i.e., G1G2) are used to indicate a range of ranks.

7k - Non-Native Vascular Plants

Table No. 1

Scientific Name	Common Name	Abundance	State Class ¹	County Class ²	Sinlahekin Class ³	Type	Code	Page	Notes
1 <i>Agropyron cristatum</i>	crested wheatgrass	1				g	AGCR	H614	
2 <i>Agropyron repens</i>	quackgrass	1				g	AGRE2	H615	
3 <i>Agrostis alba</i> var <i>alba</i>	creeping bentgrass	4				g	AGALP	H617	
4 <i>Agrostis interrupta</i>	bentgrass	1				g	AGIN4	H616	
5 <i>Alopecurus aequalis</i>	little meadow-foxtail	3				g	ALAE	H620	
6 <i>Arctium minus</i>	common burdock	1				p	ARM12	H483	
7 <i>Arrhenatherum elatius</i>	oatgrass	4				g	AREL3	H622	
8 <i>Artemisia dranunculus</i>	tarragon	1				p	ARDR4	H487	
9 <i>Asparagus officinalis</i>	asparagus	4				a	ASOF	H685	
10 <i>Asperugo procumbens</i>	catchweed	3				a	ASPR	H387	
11 <i>Avena fatua</i>	wild oats					Br			In many of the small grain food plots
12 <i>Berteroa incana</i>	berteroa	5	Bd	Bd	A	a	BEIN2	H156	
13 <i>Bromus commutatus</i>	hairy brome	3				g	BRCO4	H625	
14 <i>Bromus inermis</i> var <i>inermis</i>	smooth brome	3				g	BRINI	H626	
15 <i>Bromus japonicus</i>	Japanese brome	4				g	BRJA	H625	
16 <i>Bromus tectorum</i>	cheatgrass	1				g	BRTE	H624	
17 <i>Camelina microcarpa</i>	falseflax	4				a	CAM12	H157	
18 <i>Capsella bursa-pastoris</i>	sheperd's purse	4				a	CABU2	H157	
19 <i>Cardaria draba</i>	whitetop	4	C	B&Cr	A	p	CADR	H159	
20 <i>Centaurea diffusa</i>	diffuse knapweed	2	B	B&Cr/B&Cs	Br	b	CEDI3	H498	
21 <i>Centaurea repens</i>	Russian knapweed	2	B	B&Cr	Br	p	CERE6	H499	
22 <i>Chenopodium album</i>	lambsquarters	3				a	CHAL7	H99	
23 <i>Chenopodium hybridum</i>	maple-leaved goosefoot	3				a	CHHY	H98	
24 <i>Chorispota tenella</i>	purple cross-flower	3				a	CHTE2	H160	
25 <i>Cirsium arvense</i>	Canada thistle	1	C	B&Cs	Bs	p	CIAR4	H503	
26 <i>Cirsium vulgare</i>	bull thistle	4	C			a	CIVU	H503	
27 <i>Colutea arborescens</i>	common bladder senna					A			P. Zika identified Caragana arborescens as Colutea arborescens
28 <i>Convolvulus arvensis</i>	field morning-glory	3	C			p	COAR4	H364	
29 <i>Cuscuta approximata</i>	dodder		C			A			In alfalfa field south of knob north of Headquarters
30 <i>Cynoglossum officinale</i>	common houndstongue	1	B	B&Cr	Br	b	CYOF	H390	
31 <i>Dactylis glomerata</i>	orchardgrass	3				g	DAGL	H633	
32 <i>Descurainia richardsonii</i> var <i>viscosa</i>	mountain tansymustard	3				a	DERIV2	H162	
33 <i>Descurainia richardsonii</i> var <i>sonnei</i>	mountain tansymustard	4				a	DERIS	H161	
34 <i>Descurainia sophia</i>	flixweed	4				a	DESO2	H161	

35	<i>Dianthus armeria</i>	grass pink								H114 Found by D. Swedberg June 2005
36	<i>Elaeagnus angustifolia</i>	Russian olive	3			A	d	ELAN	H302	
37	<i>Erucastrum gallicum</i>	dog mustard	4				a	ERGA	H167	
38	<i>Euphorbia serpyllifolia</i>	thyme-leaved spurge	4				a	EUSE5	H285	
39	<i>Festuca (Vulpia) bromoides</i>	six-weeks fescue	3				g	FEBR4.	H640	
40	<i>Geranium robertianum</i>	Robert geranium	4	Bd			a	GERO	H280	
41	<i>Gypsophila paniculata</i>	baby's breath	5	C	B&Cs		p	GYPA	H114	
42	<i>Hyoscyamus niger</i>	black henbane				A				Pasture NE of HQ; along fence N of parking lot; old bldg S of Doheny
43	<i>Hypericum perforatum</i>	St. John's-wort	3	C		Br	p	HYPE	H295	
44	<i>Iris pseudacorus</i>	yellow iris	5	C		A	p	IRPS	H697	
45	<i>Iva xanthifolia</i>	tall marsh-elder	3				a	IVXA	H533	
46	<i>Kochia scoparia</i>	red belvedere aka kochia	3	B	B&Cs	Br	a	KOSC	H100	
47	<i>Lactuca serriola</i>	willow lettuce	3				a	LASE	H534	
48	<i>Lappula echinata</i>	European stickseed	3				a	LAEC	H393	
49	<i>Lappula redowskii</i>	western stickseed	3				a	LARE	H393	
50	<i>Linaria dalmatica ssp dalmatica</i>	Dalmatian toadflax	4	Bd	Bd	A	p	LIDAD	H424	
51	<i>Lonicera tartarica</i>	tartarian honeysuckle	4			Br	p	LOTA	NA	
52	<i>Lychnis alba aka Silene alba</i>	white campion aka white cockle	4	C		Br	p	LYAL	H115	
53	<i>Lycium halimifolium</i>	matrimony vine	4				p	LYHA	H411	
54	<i>Lythrum salicaria</i>	purple loosestrife		Bd		A				North side Fish Lake on shore near campground on DNR owned portion; on Sinlahekin Crk at Cecile Crk Bridge
55	<i>Malva neglecta</i>	dwarf mallow	4				a	MANE	H292	
56	<i>Matricaria matricarioides</i>	pineapple weed	3				a	MAMA11	H540	
57	<i>Medicago lupulina</i>	black medic	3				p	MELU	H269	
58	<i>Medicago sativa</i>	alfalfa	3				p	MESA	H269	
59	<i>Melilotus albus</i>	white clover	3				b	MEAL2	H270	
60	<i>Melilotus officinalis</i>	yellow clover	3				b	MEOF	H270	
61	<i>Myosotis arvensis</i>	field forget-me-not	3				a	MYAR	H396	
62	<i>Myriophyllum spicatum</i>	water-milfoil	3	B			aq	MYSP2	H313	
63	<i>Nepeta cataria</i>	catnip	3				p	NECA2	H405	
64	<i>Panicum capillare</i>	common witchgrass	3				g	PACA6	H653	
65	<i>Parthenocissus vitacea</i>	Virginia creeper	4				p	PAVI5	NA	
66	<i>Pastinaca sativa</i>	parsnip	4				b	PASA2	H335	
67	<i>Phacelia glandulifera</i>	sticky phacelia	3				a	PHGL2	H382	
68	<i>Phalaris arundinacea</i>	reed canarygrass	2	C		Bs	g	PHAR3	H654	
69	<i>Phleum pratense</i>	timothy	3				g	PHPR3	H655	

70	<i>Plantago lanceolata</i>	narrowleaf plantain	3				p	PLLA	H447	
71	<i>Plantago major</i>	common plantain	3				p	PLMA2	H447	
72	<i>Poa annua</i>	annual bluegrass	4				a	POAN	H656	
73	<i>Poa bulbosa</i>	bulbous bluegrass	1				a	POBU	H658	
74	<i>Poa compressa</i>	Canada bluegrass	3				p	POCO	H657	
75	<i>Poa pratensis</i>	Kentucky bluegrass	3				g	POPR	H661	
76	<i>Polygonum aviculare</i>	doorweed	3				a	POAV	H88	
77	<i>Polygonum convolvulus</i>	bindweed	3				a	POCO10	H85	
78	<i>Potentilla argentea</i>	silvery cinquefoil	3	M			p	POAR8	H220	
79	<i>Potentilla norvegica</i>	Norwegian cinquefoil	4				p	PONO3	H217	
80	<i>Prunus armeniaca</i>	apricot	5				t	PRAR3	NA	
81	<i>Prunus besseyi</i>	Western sandcherry	3				s	PRBE	NA	
82	<i>Pyrus malus</i>	cultivated apple	5				t	PYMA	H222	
83	<i>Ranunculus repens</i> var <i>repens</i>	creeping buttercup	3				p	RARER	H139	
84	<i>Ranunculus testiculatus</i>	hornseed buttercup	4				a	RATE	H134	
85	<i>Rheum rhaponticum</i>	rhubarb	5				p	RHRH	NA	
86	<i>Ribes sativum</i>	red currant	5				s	RISA2	H203	
87	<i>Robinia pseudoacacia</i>	black locust								Near bunkhouse at Headquarters
88	<i>Rorippa nasturtium-aquaticum</i>	water-cress	3	M			aq	RONA2	H17	
89	<i>Rosa eglanteria</i>	sweetbriar	3				s	ROEG	H223	
90	<i>Rumex acetosella</i>	sheep sorrel	3				Bs	a	RUAC3	H91
91	<i>Rumex crispus</i>	curly dock	2				p	RUCR	H92	
92	<i>Salix alba</i> var <i>vitellina</i>	golden willow	3				t	SAALV2	H66	
93	<i>Salsola kali</i>	Russian thistle	3		B&Cs		Br	a	SAKA	H101
94	<i>Sanguisorba minor</i>	burnet	4				a	SAMI3	H226	
95	<i>Saponaria officinalis</i>	bouncing bett	3				p	SAOF4	H116	
96	<i>Setaria lutescens</i>	yellow bristlegrass	3				g	SELU4	H667	
97	<i>Silene antirrhina</i>	sleepy cat	5				p	SIAN2	H117	
98	<i>Sisymbrium altissimum</i>	tall tumbled mustard	3				a	SIAL2	H176	
99	<i>Sisymbrium loeselii</i>	Loesel tumbled mustard	3				a	SILO3	H176	
100	<i>Solanum dulcamara</i>	bittersweet nightshade	1				p	SODU	H412	
101	<i>Sonchus arvensis</i>	perennial sowthistle	3	Bd	B&Cr		Br	p	SOAR2	H551
102	<i>Stellaria media</i>	chickweed	3				a	STME2	H121	
103	<i>Tamarix parviflora</i>	tamarisk aka salt cedar	5	Bd			A	s	TAPA4	H296 In golden willow area and near bunkhouse near HQ; At old bldg S of Doheny Lake
104	<i>Taraxacum officinale</i>	common dandelion	1				b	TAOF	H553	
105	<i>Thlaspi arvense</i>	field pennycress	3				a	THAR5	H179	
106	<i>Tragopogon dubius</i>	yellow salsify	3				b	TRDU	H555	
107	<i>Trifolium pratense</i>	red clover	3				p	TRPR2	H277	
108	<i>Trifolium repens</i>	white clover	3				p	TRRE3	H276	
109	<i>Ulmus pumila</i>	Siberian elm	4				t	ULPU	H75	
110	<i>Verbascum thapsus</i>	common mullein	2	M	B&Cs		Br	b	VETH	H442
111	<i>Verbena bracteata</i>	bracted verbena	3				a	VEBR3	H398	

112	<i>Vicia sativa</i>	common vetch	4	p	VISA	H279
113	<i>Vitis riparia</i>	riverbank grape-vine	5	p	VIRI	H291

Bolded Species are target weed species for control

¹**State Class:** Bd = B designate weeds; C = Class C weeds; M = Weed to Monitor

²**County Class:** Bd = B designate weed; B&Cr = B&C reduction weeds; B&Cs = B&C suppression weeds

³**Sinlahekin Class:** A = Weeds to eradicate; Br = B reduction weeds; Bs = B suppression weeds

7l – Noxious Weeds
See 6k-Table 1

**7m- Club Mosses, Mosses and Lichen
Under construction**

7n – Priority Species Lists

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

Vertebrates:

FISH					
For information on state listed or candidate species, see the SOC List .					
COMMON NAME	Scientific name	SPECIES CRITERIA	WASHINGTON STATUS	Priority Area	Presence Confirmed on SWA
Minnnows (Cyprinidae)					
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
Suckers (Catostomidae)					

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

Herons (Ciconiiformes)

Great blue heron	<i>Ardea herodias</i>		2			Breeding areas	Yes
Black-crowned night heron	<i>Nycticorax nycticorax</i>		2			Breeding areas	Yes

Waterfowl (Anseriformes)

	<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	Yes
Bufflehead	<i>Bucephala albeola</i>			3	Game	Breeding areas	Yes
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	Yes
Harlequin duck	<i>Histrionicus histrionicus</i>		2	3	Game	Breeding areas, regular and regular large concentrations in saltwater	Yes
Hooded merganser	<i>Lophodytes cucullatus</i>			3	Game	Breeding areas	Yes

Hawks, Falcons, Eagles (Falconiformes)

Northern goshawk	<i>Accipiter gentilis</i>	1			State Listed or Candidate Species	Breeding areas, including alternate nest sites, post-fledging foraging areas	Yes
Golden eagle	<i>Aquila chrysaetos</i>	1			State Listed or Candidate Species	Breeding and foraging areas	Yes
Merlin	<i>Falco columbarius</i>	1			State Listed or Candidate Species	Breeding sites	Yes
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

Upland Game Birds (Galliformes)

Chukar	<i>Alectoris chukar</i>			3	Game	Regular and regular large concentrations in WDFW's Primary Management Zones for chukar	Yes
Blue grouse	<i>Dendragapus obscurus</i>			3	Game	Breeding areas, regular concentrations	Yes
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
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	1		3	State Listed or Candidate Species Game	Breeding areas, leks, regular and regular large concentrations, critical wintering habitat (riparian zones)	Yes
Cranes (Gruiformes)							
Sandhill crane	<i>Grus canadensis</i>	1			State Listed or Candidate Species	Breeding areas, regular large concentrations, migration staging areas	
Shorebirds (Charadriiformes)							
Eastern Washington breeding occurrences of: Phalaropes			2			Breeding areas	
Pigeons (Columbiformes)							
Band-tailed pigeon	<i>Columba fasciata</i>			3	Game	Breeding areas, regular concentrations, occupied mineral springs	Yes
Cuckoos (Cuculiformes)							
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	1			State Listed or Candidate Species	Any occurrence	
Owls (Strigiformes)							
Burrowing owl	<i>Athene cunicularia</i>	1			State Listed or Candidate Species	Breeding areas, foraging areas, regular concentrations	
Flammulated owl	<i>Otus flammeolus</i>	1			State Listed or Candidate Species	Breeding sites, regular occurrences	

Swifts (Apodiformes)

Vaux's swift	<i>Chaetura vauxi</i>	1			State Listed or Candidate Species	Breeding areas, communal roosts	Yes
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Woodpeckers (Piciformes)

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
White-headed woodpecker	<i>Picoides albolarvatus</i>	1			State Listed or Candidate Species	Breeding sites, regular occurrences	
Black-backed woodpecker	<i>Picoides arcticus</i>	1			State Listed or Candidate Species	Breeding areas and regular occurrences	Yes

Perching Birds (Passeriformes)

Sage sparrow	<i>Amphispiza belli</i>	1			State Listed or Candidate Species	Breeding areas, regular occurrences in suitable habitat during breeding season	
Loggerhead shrike	<i>Lanius ludovicianus</i>	1			State Listed or Candidate Species	Regular occurrences in breeding areas, regular and regular large concentrations	
Sage thrasher	<i>Oreoscoptes montanus</i>	1			State Listed or Candidate Species	Breeding areas, regular occurrences in suitable habitat during breeding season	

MAMMALS

For information on state listed or candidate species, see the [SOC List](#).

Shrews (Insectivora)

Merriam's shrew	<i>Sorex merriami</i>	1			State Listed or Candidate Species	Any occurrence	
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Bats (Chiroptera)

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
Rabbits (Lagomorpha)							
White-tailed jack rabbit	<i>Lepus townsendii</i>	1		3	State Listed or Candidate Species; Game	Regular and regular large concentrations Any occurrence	
Rodents (Rodentia)							
Western gray squirrel	<i>Sciurus griseus</i>	1			State Listed or Candidate Species	Any occurrence	
Terrestrial Carnivores (Carnivora)							
Gray wolf	<i>Canis lupus</i>	1			State Listed or Candidate Species	Any occurrence	
Wolverine	<i>Gulo gulo</i>	1			State Listed or Candidate Species	Any occurrence	
Lynx	<i>Lynx canadensis</i>	1			State Listed or Candidate Species	Any occurrence	
Marten	<i>Martes americana</i>			3	Game	Regular occurrences	
Fisher	<i>Martes pennanti</i>	1			State Listed or Candidate Species	Any occurrence	
Mink	<i>Mustela vison</i>			3	Game	Regular occurrences	
Ursus arctos	<i>Grizzly bear</i>	1			State Listed or Candidate Species	Any occurrence	
Big Game Ungulates (Artiodactyla)							
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
Mountain goat	<i>Oreamnos americanus</i>			3	Game	Breeding areas, regular concentrations	Yes
Bighorn sheep	<i>Ovis canadensis</i>			3	Game	Breeding areas, regular and regular large concentrations	Yes

7o - Federal and State Listed and Candidate Species

SWA 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 SWA, but the habitat characteristics of the undocumented species occur on the SWA 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 SWA. (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 SWA	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
BLACK-BACKED WOODPECKER	<i>PICOIDES ARCTICUS</i>	Bird	none	SC	Yes	B, RI
BURROWING OWL	<i>ATHENE CUNICULARIA</i>	Bird	FSC	SC		B
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
FLAMMULATED OWL	<i>OTUS FLAMMEOLUS</i>	Bird	none	SC		B, RI
GOLDEN EAGLE	<i>AQUILA CHRYSAETOS</i>	Bird	none	SC	Yes	B
GRAY WOLF	<i>CANIS LUPUS</i>	Mammal	FT	SE		IO
GREAT ARCTIC	<i>OENEIS NEVADENSIS GIGAS</i>	Butterfly	none	SC		IO
GRIZZLY BEAR	<i>URSUS ARCTOS</i>	Mammal	FT	SE		IO
HARLEQUIN DUCK	<i>HISTRIONICUS HISTRIONICUS</i>	Bird	none	none	Yes	None
JUNIPER HAIRSTREAK	<i>MITOURA GRYNEA BARRYI</i>	Butterfly	none	SC		IO
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
LYNX	<i>LYNX CANADENSIS</i>	Mammal	FT	ST		IO
MERLIN	<i>FALCO COLUMBARIUS</i>	Bird	none	SC	Yes	B
MERRIAM'S SHREW	<i>SOREX MERRIAMI</i>	Mammal	none	SC		IO
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>DRYOCOPIUS PILEATUS</i>	Bird	none	SC	Yes	B
SAGE SPARROW	<i>AMPHISPIZA BELLI</i>	Bird	none	SC		B
SAGE THRASHER	<i>OREOSCOPTES MONTANUS</i>	Bird	none	SC		B
SAGEBRUSH LIZARD	<i>SCELOPORUS GRACIOSUS</i>	Reptile	none	SC		IO
SANDHILL CRANE	<i>GRUS CANADENSIS</i>	Bird	none	SE	Yes	B, RLC
SHARP-TAILED GROUSE	<i>TYMPANUCHUS PHASIANELLUS</i>	Bird	FSC	ST	Yes	B, RSC
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 GRAY SQUIRREL	<i>SCIURUS GRISEUS</i>	Mammal	FSC	ST		IO
WESTERN GREBE	<i>AECHMOPHORUS OCCIDENTALIS</i>	Bird	none	SC		B
WESTERN TOAD	<i>BUFO BOREAS</i>	Amphibian	FSC	SC	Yes	None
WHITE-HEADED WOODPECKER	<i>PICOIDES ALBOLARVATUS</i>	Bird	none	SC		B, RI
WHITE-TAILED JACK RABBIT	<i>LEPUS TOWNSENDII</i>	Mammal	none	SC		IO
WOLVERINE	<i>GULO GULO</i>	Mammal	FSC	SC		IO
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) CR: Communal Roost
RC,RLC,RSC: Regular (Large or Small) Concentration RI: Regular Individual
IO: Individual Occurrence

7p - State Species of Concern

COMMON NAME	SCIENTIFIC NAME	ANIMAL TYPE	FEDERAL STATUS	STATE STATUS	MAPPING CRITERIA
WESTERN TOAD	<i>BUFO BOREAS</i>	Amphibian	FCo	SC	IO
NORTHERN LEOPARD FROG	<i>RANA PIPIENS</i>	Amphibian	FCo	SE	IO
OREGON SPOTTED FROG	<i>RANA PRETIOSA</i>	Amphibian	FC	SE	IO
COLUMBIA SPOTTED FROG	<i>RANA LUTEIVENTRIS</i>	Amphibian	none	SC	IO
CASCADE TORRENT SALAMANDER	<i>RHYACOTRITON CASCADAE</i>	Amphibian	none	SC	IO
DUNN'S SALAMANDER	<i>PLETHODON DUNNI</i>	Amphibian	none	SC	IO
LARCH MOUNTAIN SALAMANDER	<i>PLETHODON LARSELLI</i>	Amphibian	FCo	SS	IO
VAN DYKE'S SALAMANDER	<i>PLETHODON VANDYKEI</i>	Amphibian	FCo	SC	IO
ROCKY MOUNTAIN TAILED FROG	<i>ASCAPHUS MONTANUS</i>	Amphibian	none	SC	IO
COMMON LOON	<i>GAVIA IMMER</i>	Bird	none	SS	B
WESTERN GREBE	<i>AECHMOPHORUS OCCIDENTALIS</i>	Bird	none	SC	B
SHORT-TAILED ALBATROSS	<i>PHOEBASTRIA ALBATRUS</i>	Bird	FE	SC	IO
AMERICAN WHITE PELICAN	<i>PELECANUS ERYTHRORHYNCHOS</i>	Bird	none	SE	B,RSC
BROWN PELICAN	<i>PELECANUS OCCIDENTALIS</i>	Bird	FE	SE	RSC
BRANDT'S CORMORANT	<i>PHALACROCORAX PENICILLATUS</i>	Bird	none	SC	B
GOLDEN EAGLE	<i>AQUILA CHRYSAETOS</i>	Bird	none	SC	B
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	Bird	FCo	ST	B,RSC,CR
NORTHERN GOSHAWK	<i>ACCIPITER GENTILIS</i>	Bird	FCo	SC	B
FERRUGINOUS HAWK	<i>BUTEO REGALIS</i>	Bird	FCo	ST	B
MERLIN	<i>FALCO COLUMBARIUS</i>	Bird	none	SC	B
PEREGRINE FALCON	<i>FALCO PEREGRINUS</i>	Bird	FCo	SS	B,RI
AMERICAN PEREGRINE FALCON	<i>FALCO PEREGRINUS ANATUM</i>	Bird	FCo	SS	B,RI
ARCTIC PEREGRINE FALCON	<i>FALCO PEREGRINUS TUNDRIUS</i>	Bird	FCo	SS	RI
PEALE'S PEREGRINE FALCON	<i>FALCO PEREGRINUS PEALEI</i>	Bird	FCo	SS	B,RI
SHARP-TAILED GROUSE	<i>TYMPANUCHUS PHASIANELLUS</i>	Bird	FCo	ST	B,RSC
SAGE GROUSE	<i>CENTROCERCUS UROPHASIANUS</i>	Bird	FC	ST	B,RSC
SANDHILL CRANE	<i>GRUS CANADENSIS</i>	Bird	none	SE	B,RLC
SNOWY PLOVER	<i>CHARADRIUS ALEXANDRINUS</i>	Bird	FT	SE	B

UPLAND SANDPIPER	<i>BARTRAMIA LONGICAUDA</i>	Bird	none	SE	B,RI
COMMON MURRE	<i>URIA AALGE</i>	Bird	none	SC	B,RC
MARbled MURRELET	<i>BRACHYRAMPHUS MARMORATUS</i>	Bird	FT	ST	B
CASSIN'S AUKLET	<i>PTYCHORAMPHUS ALEUTICUS</i>	Bird	FCo	SC	B
TUFTED PUFFIN	<i>FRATERCULA CIRRHATA</i>	Bird	FCo	SC	RLC
YELLOW-BILLED CUCKOO	<i>COCCYZUS AMERICANUS</i>	Bird	FC	SC	B,RI
BURROWING OWL	<i>ATHENE CUNICULARIA</i>	Bird	FCo	SC	B
FLAMMULATED OWL	<i>OTUS FLAMMEOLUS</i>	Bird	none	SC	B,RI
SPOTTED OWL	<i>STRIX OCCIDENTALIS</i>	Bird	FT	SE	IO
VAUX'S SWIFT	<i>CHAETURA VAUXI</i>	Bird	none	SC	B,CR
LEWIS' WOODPECKER	<i>MELANERPES LEWIS</i>	Bird	none	SC	B
PILEATED WOODPECKER	<i>DRYOCOPUS PILEATUS</i>	Bird	none	SC	B
WHITE-HEADED WOODPECKER	<i>PICOIDES ALBOLARVATUS</i>	Bird	none	SC	B,RI
BLACK-BACKED WOODPECKER	<i>PICOIDES ARCTICUS</i>	Bird	none	SC	B,RI
PURPLE MARTIN	<i>PROGNE SUBIS</i>	Bird	none	SC	B
SLENDER-BILLED WHITE-BREASTED NUTHATCH	<i>SITTA CAROLINENSIS ACULEATA</i>	Bird	FCo	SC	IO
LOGGERHEAD SHRIKE	<i>LANIUS LUDOVICIANUS</i>	Bird	FCo	SC	B
OREGON VESPER SPARROW	<i>POOECETES GRAMINEUS AFFINIS</i>	Bird	FCo	SC	B
SAGE SPARROW	<i>AMPHISPIZA BELLI</i>	Bird	none	SC	B
SAGE THRASHER	<i>OREOSCOPTES MONTANUS</i>	Bird	none	SC	B
STREAKED HORNED LARK	<i>EREMOPHILA ALPESTRIS STRIGATA</i>	Bird	FC	SE	B
ISLAND MARBLE	<i>EUCHLOE AUSONIDES INSULANUS</i>	Butterfly/Moth	FCo	SC	IO
MAKAH (QUEEN CHARLOTTE) COPPER	<i>LYCAENA MARIPOSA CHARLOTTENSIS</i>	Butterfly/Moth	FCo	SC	IO
PUGET BLUE	<i>PLEBEJUS ICARIOIDES BLACKMOREI</i>	Butterfly/Moth	none	SC	IO
VALLEY SILVERSPOT	<i>SPEYERIA ZERENE BREMNERII</i>	Butterfly/Moth	FCo	SC	IO
GREAT ARCTIC	<i>OENEIS NEVADENSIS GIGAS</i>	Butterfly/Moth	none	SC	IO
OREGON SILVERSPOT BUTTERFLY	<i>SPEYERIA ZERENE HIPPOLYTA</i>	Butterfly/Moth	FT	SE	IO
MARDON SKIPPER	<i>POLITES MARDON</i>	Butterfly/Moth	FC	SE	IO
SHEPARD'S PARNASSIAN	<i>PARNASSIUS CLODIUS SHEPARDI</i>	Butterfly/Moth	none	SC	IO
SILVER-BORDERED FRITILLARY	<i>BOLORIA SELENE ATROCOSTALIS</i>	Butterfly/Moth	none	SC	IO
JOHNSON'S HAIRSTREAK	<i>MITOURA JOHNSONI</i>	Butterfly/Moth	none	SC	IO
JUNIPER HAIRSTREAK	<i>MITOURA GRYNEA BARRYI</i>	Butterfly/Moth	none	SC	IO
CHINQUAPIN HAIRSTREAK	<i>HABRODAIS GRUNUS HERRI</i>	Butterfly/Moth	none	SC	IO

YUMA SKIPPER	<i>OCHLODES YUMA</i>	Butterfly/Moth	none	SC	IO
TAYLOR'S CHECKERSPOT	<i>EUPHYDRYAS EDITHA TAYLORI</i>	Butterfly/Moth	FC	SE	IO
SAND-VERBENA MOTH	<i>COPABLEPHARON FUSCUM</i>	Butterfly/Moth	none	SC	IO
RIVER LAMPREY	<i>LAMPETRA AYRESI</i>	Fish	FCo	SC	IO
PACIFIC HERRING (CHERRY POINT)	<i>CLUPEA PALLASI</i>	Fish	FC	SC	IO
PACIFIC HERRING (DISCOVERY BAY)	<i>CLUPEA PALLASI</i>	Fish	FC	SC	IO
CHUM SALMON (HOOD CANAL SU)	<i>ONCORHYNCHUS KETA</i>	Fish	FT	SC	none
CHUM SALMON (LOWER COLUMBIA)	<i>ONCORHYNCHUS KETA</i>	Fish	FT	SC	none
COHO SALMON (LOWER COLUMBIA/SW WA)	<i>ONCORHYNCHUS KISUTCH</i>	Fish	FC	none	none
SOCKEYE SALMON (SNAKE R.)	<i>ONCORHYNCHUS NERKA</i>	Fish	FE	SC	none
SOCKEYE SALMON (OZETTE LAKE)	<i>ONCORHYNCHUS NERKA</i>	Fish	FT	SC	none
CHINOOK SALMON (PUGET SOUND)	<i>ONCORHYNCHUS TSHAWYTSCHA</i>	Fish	FT	SC	none
CHINOOK SALMON (UPPER COLUMBIA SP)	<i>ONCORHYNCHUS TSHAWYTSCHA</i>	Fish	FE	SC	none
CHINOOK SALMON (LOWER COLUMBIA)	<i>ONCORHYNCHUS TSHAWYTSCHA</i>	Fish	FT	SC	none
CHINOOK SALMON (SNAKE R. SP/SU)	<i>ONCORHYNCHUS TSHAWYTSCHA</i>	Fish	FT	SC	none
CHINOOK SALMON (SNAKE R. FALL)	<i>ONCORHYNCHUS TSHAWYTSCHA</i>	Fish	FT	SC	none
STEELHEAD (SNAKE RIVER)	<i>ONCORHYNCHUS MYKISS</i>	Fish	FT	SC	none
STEELHEAD (MIDDLE COLUMBIA)	<i>ONCORHYNCHUS MYKISS</i>	Fish	FT	SC	none
STEELHEAD (UPPER COLUMBIA)	<i>ONCORHYNCHUS MYKISS</i>	Fish	FT	SC	none
STEELHEAD (PUGET SOUND)	<i>ONCORHYNCHUS MYKISS</i>	Fish	FT	.	none
STEELHEAD (LOWER COLUMBIA)	<i>ONCORHYNCHUS MYKISS</i>	Fish	FT	SC	none
BULL TROUT	<i>SALVELINUS CONFLUENTUS</i>	Fish	FT	SC	none
BULL TROUT (COLUMBIA BASIN)	<i>SALVELINUS CONFLUENTUS</i>	Fish	FT	SC	none
BULL TROUT (COASTAL/PUGET SOUND)	<i>SALVELINUS CONFLUENTUS</i>	Fish	FT	SC	none
EULACHON	<i>THALEICHTHYS PACIFICUS</i>	Fish	none	SC	RC
OLYMPIC MUDMINNOW	<i>NOVUMBRA HUBBSI</i>	Fish	none	SS	IO
PYGMY WHITEFISH	<i>PROSOPIUM COULTERI</i>	Fish	FCo	SS	IO
LAKE CHUB	<i>COUESIUS PLUMBEUS</i>	Fish	none	SC	IO
LEOPARD DACE	<i>RHINICHTHYS FALCATUS</i>	Fish	none	SC	IO
UMATILLA DACE	<i>RHINICHTHYS UMATILLA</i>	Fish	none	SC	IO
MOUNTAIN SUCKER	<i>CATOSTOMUS PLATYRHYNCHUS</i>	Fish	none	SC	IO

PACIFIC COD (S&C PUGET SOUND)	<i>GADUS MACROCEPHALUS</i>	Fish	FCo	SC	IO
PACIFIC HAKE (C. PUGET SOUND)	<i>MERLUCCIIUS PRODUCTUS</i>	Fish	FCo	SC	IO
WALLEYE POLLOCK (SO. PUGET SOUND)	<i>THERAGRA CHALCOGRAMMA</i>	Fish	FCo	SC	IO
BROWN ROCKFISH	<i>SEBASTES AURICULATUS</i>	Fish	FCo	SC	IO
COPPER ROCKFISH	<i>SEBASTES CAURINUS</i>	Fish	FCo	SC	IO
GREENSTRIPED ROCKFISH	<i>SEBASTES ELONGATUS</i>	Fish	none	SC	IO
WIDOW ROCKFISH	<i>SEBASTES ENTOMELAS</i>	Fish	none	SC	IO
YELLOWTAIL ROCKFISH	<i>SEBASTES FLAVIDUS</i>	Fish	none	SC	IO
QUILLBACK ROCKFISH	<i>SEBASTES MALIGER</i>	Fish	FCo	SC	IO
BLACK ROCKFISH	<i>SEBASTES MELANOPS</i>	Fish	none	SC	IO
CHINA ROCKFISH	<i>SEBASTES NEBULOSUS</i>	Fish	none	SC	IO
TIGER ROCKFISH	<i>SEBASTES NIGROCINCTUS</i>	Fish	none	SC	IO
BOCACCIO ROCKFISH	<i>SEBASTES PAUCISPINIS</i>	Fish	none	SC	IO
CANARY ROCKFISH	<i>SEBASTES PINNIGER</i>	Fish	none	SC	IO
REDSTRIPE ROCKFISH	<i>SEBASTES PRORIGER</i>	Fish	none	SC	IO
YELLOWEYE ROCKFISH	<i>SEBASTES RUBERRIMUS</i>	Fish	none	SC	IO
MARGINED SCULPIN	<i>COTTUS MARGINATUS</i>	Fish	FCo	SS	IO
MERRIAM'S SHREW	<i>SOREX MERRIAMI</i>	Mammal	none	SC	IO
KEEN'S MYOTIS	<i>MYOTIS KEENII</i>	Mammal	none	SC	B,IO
TOWNSEND'S BIG-EARED BAT	<i>CORYNORHINUS TOWNSENDII</i>	Mammal	FCo	SC	B,CR
PACIFIC TOWNSEND'S BIG-EARED BAT	<i>CORYNORHINUS TOWNSENDII TOWNSENDII</i>	Mammal	FCo	SC	B,CR
PALLID TOWNSEND'S BIG-EARED BAT	<i>CORYNORHINUS TOWNSENDII PALLESCENS</i>	Mammal	FCo	SC	B,CR
PYGMY RABBIT	<i>BRACHYLAGUS IDAHOENSIS</i>	Mammal	FE	SE	IO
WHITE-TAILED JACKRABBIT	<i>LEPUS TOWNSENDII</i>	Mammal	none	SC	IO
BLACK-TAILED JACKRABBIT	<i>LEPUS CALIFORNICUS</i>	Mammal	none	SC	IO
WESTERN GRAY SQUIRREL	<i>SCIURUS GRISEUS</i>	Mammal	FCo	ST	IO
WASHINGTON GROUND SQUIRREL	<i>SPERMOPHILUS WASHINGTONI</i>	Mammal	FC	SC	IO
TOWNSEND'S GROUND SQUIRREL	<i>SPERMOPHILUS TOWNSENDII TOWNSENDII</i>	Mammal	none	SC	IO
MAZAMA (WESTERN) POCKET GOPHER	<i>THOMOMYS MAZAMA</i>	Mammal	FC	ST	IO
SHELTON POCKET GOPHER	<i>THOMOMYS MAZAMA COUCHI</i>	Mammal	FC	ST	IO
OREGON POCKET GOPHER	<i>THOMOMYS MAZAMA OREGONUS</i>	Mammal	none	ST	IO
CATHLAMET POCKET GOPHER	<i>THOMOMYS MAZAMA LOUIEI</i>	Mammal	FC	ST	IO
OI YMPIC. POCKET	<i>THOMOMYS MAZAMA</i>	Mammal	FC	ST	IO

GOPHER	<i>MELANOPS</i>				
YELM POCKET GOPHER	<i>THOMOMYS MAZAMA</i> <i>YELMENSIS</i>	Mammal	FC	ST	IO
GRAY-TAILED VOLE	<i>MICROTUS CANICAUDUS</i>	Mammal	none	SC	IO
GRAY WOLF	<i>CANIS LUPUS</i>	Mammal	FE	SE	IO
GRIZZLY BEAR	<i>URSUS ARCTOS</i>	Mammal	FT	SE	IO
FISHER	<i>MARTES PENNANTI</i>	Mammal	FC	SE	IO
WOLVERINE	<i>GULO GULO</i>	Mammal	FCo	SC	IO
SEA OTTER	<i>ENHYDRA LUTRIS</i>	Mammal	FCo	SE	B,RI,RSC
SEA OTTER	<i>ENHYDRA LUTRIS LUTRIS</i>	Mammal	none	SE	B,RI,RSC
LYNX	<i>LYNX CANADENSIS</i>	Mammal	FT	ST	IO
GRAY WHALE	<i>ESCHRICHTIUS</i> <i>ROBUSTUS</i>	Mammal	none	SS	IO
SEI WHALE	<i>BALAENOPTERA</i> <i>BOREALIS</i>	Mammal	FE	SE	IO
FIN WHALE	<i>BALAENOPTERA</i> <i>PHYSALUS</i>	Mammal	FE	SE	IO
BLUE WHALE	<i>BALAENOPTERA</i> <i>MUSCULUS</i>	Mammal	FE	SE	IO
HUMPBACK WHALE	<i>MEGAPTERA</i> <i>NOVAEANGLIAE</i>	Mammal	FE	SE	IO
BLACK RIGHT WHALE	<i>BALAENA GLACIALIS</i>	Mammal	FE	SE	IO
KILLER WHALE	<i>ORCINUS ORCA</i>	Mammal	FE	SE	IO
PACIFIC HARBOR PORPOISE	<i>PHOCOENA PHOCOENA</i>	Mammal	none	SC	RSC
SPERM WHALE	<i>PHYSETER</i> <i>MACROCEPHALUS</i>	Mammal	FE	SE	IO
COLUMBIAN WHITE- TAILED DEER	<i>ODOCOILEUS</i> <i>VIRGINIANUS LEUCURUS</i>	Mammal	FE	SE	IO
WOODLAND CARIBOU	<i>RANGIFER TARANDUS</i>	Mammal	FE	SE	IO
STELLER SEA LION	<i>EUMETOPIAS JUBATUS</i>	Mammal	FT	ST	RSC
PINTO ABALONE	<i>HALIOTIS</i> <i>KAMTSCHATKANA</i>	Mollusk	FCo	SC	IO
OLYMPIA OYSTER	<i>OSTREA LURIDA</i>	Mollusk	none	SC	IO
GIANT COLUMBIA RIVER LIMPET	<i>FISHEROLA NUTTALLI</i>	Mollusk	none	SC	IO
GREAT COLUMBIA SPIRE SNAIL	<i>FLUMINICOLA</i> <i>COLUMBIANA</i>	Mollusk	FCo	SC	IO
BLUE-GRAY TAILDROPPER	<i>PROPHYSAON</i> <i>COERULEUM</i>	Mollusk	none	SC	IO
COLUMBIA OREGONIAN	<i>CRYPTOMASTIX</i> <i>HENDERSONI</i>	Mollusk	none	SC	IO
POPLAR OREGONIAN	<i>CRYPTOMASTIX POPULI</i>	Mollusk	none	SC	IO
DALLES SIDEBAND	<i>MONADENIA FIDELIS</i> <i>MINOR</i>	Mollusk	none	SC	IO
NEWCOMB'S LITTORINE SNAIL	<i>ALGAMORDA</i> <i>SUBROTUNDATA</i>	Mollusk	FCo	SC	IO
CALIFORNIA FLOATER	<i>ANODONTA</i> <i>CALIFORNIENSIS</i>	Mollusk	FCo	SC	IO
COLUMBIA CLUBTAIL	<i>GOMPHUS LYNNAE</i>	Other Insect	FCo	SC	IO
COLUMBIA RIVER TIGER BEETLE	<i>CICINDELA COLUMBICA</i>	Other Insect	none	SC	IO

BOG IDOL LEAF BEETLE	<i>DONACIA IDOLA</i>	Other Insect	none	SC	IO
HATCH'S CLICK BEETLE	<i>EANUS HATCHI</i>	Other Insect	FCo	SC	IO
BELLER'S GROUND BEETLE	<i>AGONUM BELLERI</i>	Other Insect	FCo	SC	IO
MANN'S MOLLUSK- EATING GROUND BEETLE	<i>SCAPHINOTUS MANNII</i>	Other Insect	none	SC	IO
WESTERN POND TURTLE	<i>CLEMMYS MARMORATA</i>	Reptile	FCo	SE	IO
LEATHERBACK SEA TURTLE	<i>DERMOCHELYS CORIACEA</i>	Reptile	FE	SE	IO
GREEN SEA TURTLE	<i>CHELONIA MYDAS</i>	Reptile	FT	ST	IO
SAGEBRUSH LIZARD	<i>SCELOPORUS GRACIOSUS</i>	Reptile	FCo	SC	IO
LOGGERHEAD SEA TURTLE	<i>CARETTA CARETTA</i>	Reptile	FT	ST	IO
SHARPTAIL SNAKE	<i>CONTIA TENUIS</i>	Reptile	FCo	SC	IO
STRIPED WHIPSNAKE	<i>MASTICOPHIS TAENIATUS</i>	Reptile	none	SC	IO
CALIFORNIA MOUNTAIN KINGSNAKE	<i>LAMPROPELTIS ZONATA</i>	Reptile	none	SC	IO

7q - Priority Habitats as Related to the SWA

Habitat Type or Element	Priority Area
Aspen stands	Pure or mixed stands of aspen greater than 0.8 ha (2 acres).
	Criteria: High fish and wildlife species diversity, limited availability, high vulnerability to habitat alteration.
Caves	A naturally occurring cavity, recess, void, or system of interconnected passages (including associated dendritic tubes, cracks, and fissures) which occurs under the earth in soils, rock, ice, or other geological formations, and is large enough to contain a human. Mine shafts may mimic caves, and those abandoned mine shafts with actual or suspected occurrences of priority species should be treated in a manner similar to caves. A mine is a man-made excavation in the earth usually used to extract minerals.
	Criteria: Comparatively high wildlife density, important wildlife breeding habitat and seasonal ranges, limited availability, vulnerability to human disturbance, dependent species.
Cliffs	Greater than 7.6 m (25 ft) high and occurring below 1524 m (5000 ft).
	Criteria: Significant wildlife breeding habitat, limited availability, dependent species.
Freshwater Wetlands and Deep Freshwater	<p>Freshwater Wetlands: 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>Fresh Deepwater: 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>
	Criteria: 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
Instream	The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
	Criteria: 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 style="text-align: center;">Old-growth/Mature Forest</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 >150 years of age, with 25 trees/ha (10 trees/acre) > 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 - 3 snags/acre) > 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>Criteria: 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 style="text-align: center;">Riparian</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>Criteria: 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 style="text-align: center;">Rural natural open space</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>Criteria: 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>

Shrub-steppe	<p><u>Large Tracts:</u> Tracts of land >259 ha (640 ac) consisting of plant communities with one or more layers of perennial grasses and a conspicuous but discontinuous layer of shrubs. Large tracts of shrub-steppe contribute to the overall continuity of the habitat type throughout the region because they are relatively unfragmented, contain a substantial amount of interior habitat, and are in close proximity to other tracts of shrub-steppe. These tracts should contain a variety of habitat features (e.g., variety of topography, riparian areas, canyons, habitat edges, plant communities). Another important component is habitat quality based on the degree with which a tract resembles a site potential natural community, which may include factors such as soil condition and degree of erosion; and distribution, coverage, and vigor of native shrubs, forbs, grasses, and cryptogams.</p> <p><u>Small Tracts:</u> Tracts of land <259 ha (640 ac) with a habitat type consisting of plant communities with one or more layers of perennial grasses and a conspicuous but discontinuous layer of shrubs. Although smaller in size and possibly more isolated from other tracts of shrub-steppe these areas are still important to shrub-steppe obligate and other state-listed wildlife species. Also, important are the variety of habitat features and habitat quality aspects as listed above.</p>
	<p>Criteria: Comparatively high fish and wildlife density and species diversity; important fish and wildlife breeding habitat and seasonal ranges, limited availability, high vulnerability to habitat alteration, unique and dependent species.</p>
	<p>Snags and logs</p> <p>Snags and logs occur within a variety of habitat types that support trees. Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of ≥ 51 cm (20 in) in western Washington and ≥ 30 cm (12 in) in eastern Washington, and are ≥ 2 m (6.5 ft) in height. Priority logs are ≥ 30 cm (12 in) in diameter at the largest end, and ≥ 6 m (20 ft) long. Abundant snags and logs can be found in old-growth and mature forests or unmanaged forests of any age, in damaged, burned, or diseased forests, and in riparian areas. Priority snag and log habitat includes individual snags and/or logs, or groups of snags and/or logs of exceptional value to wildlife due to their scarcity or location in a particular landscape. Areas with abundant, well distributed snags and logs are also considered priority snag and log habitat. Examples include large, sturdy snags adjacent to open water, remnant snags in developed or urbanized settings, and areas with a relatively high density of snags.</p> <p>Criteria: Comparatively high fish and wildlife density and species diversity, important fish and wildlife breeding habitat and seasonal ranges, limited availability, high vulnerability to habitat alteration, large number of cavity-dependent species.</p>
Talus	<p>Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.</p>
	<p>Criteria: Limited availability, unique and dependent species, high vulnerability to habitat alteration.</p>

APPENDIX 8. Adjacent Landowners

Samuel Peacemaker
2219 S Jackrabbit Trail
Buckeye, AZ 85326

John & Jerilee Crossman
4075 Charlton Ave.
Hemet, CA 92544
909-658-9567

Hurlow Family Wilderness Trust
2760 Dearborn St
Salt Lake City, UT 84106
801-467-7136

Shirley Pickering
32292 Hwy 97
Oroville, WA 98844
509-486-4280

Garry & Shirley Will
P.O. Box 178
Loomis, WA 98827
509-223-3560

Loomis Cattle Company
20 Woodard Rd
Loomis, WA 98827
509-223-4808

Hans Hansen
P.O Box 250
Riverside, WA 98849
509-486-4678

Stephen & Laurie Duncan
P.O Box 608
Friday Harbor, WA 98250

Hidden Hills Resort
104 Hidden Hills Ln
Tonasket, WA 98855
509-486-1895

Kelvin & Vicki Davis
271 Fish Lake Rd
Tonasket, WA 98855
509-486-2714

Tom & Delores Jones
327 Fish Lake Rd
Tonasket, WA 98855
509-486-2855

Gerald E. Scholz
49 S. Pine Creek Rd
Tonasket, WA 98855
509-826-4347

Wade Cunningham
TL Ranch LLC
1165 Conconully Hwy
Okanogan, WA 98840
509-826-6822

Tim Vugteveen, Manager
Highlands District
Washington Department of Natural Resources
Northeast Region
P.O. Box 190
Colville, WA 98827
1-800-527-3305

Mark Morris, Ranger
Tonasket Ranger District
Okanogan – Wenatchee
National Forest
USDA US Forest Service
1 W Winesap
Tonasket, WA 98855
509-486-2186

Greg & Carol James
5908 SE 20th St.
Mercer Island, WA 98

APPENDIX 9. Eastern Okanogan County Citizen Advisory Group

Vacant, Supervisor, Okanogan County Noxious Weed Office, P.O. Box 791, Okanogan, WA. 98840, @co.okanogan.wa.us

Jerry Barnes, Okanogan Co. Cattleman and Okanogan County Concerned Citizens (OC3), P.O. Box D, Loomis, WA. 98827, barjrwr@gmail.com

Bob Gillespie, Wenatchee Valley College, 116 West Apple, Omak, WA. 98841, bgillespie@wvc.edu

Lee Root, Okanogan Valley Land Council, P.O. Box 405, Oroville, WA. 98855, lsroot@nvnet.com

Joe Berney, Land Owner, 1751 Conconully Hwy, Okanogan, WA. 98840

Jim Weed, Okanogan Trails Coalition, 6 Cherokee Rd, Omak, WA. 98841, jweed@ncidata.com

Jere Gillespie, Chesaw resident, P.O. Box 792 Omak, WA. 98841, columbiana@televar.com

Brian Derting, WDNR, P.O. Box 190, Colville, WA. 99114, Brian.derting@wadnr.gov

Dick Finch, Okanogan Wildlife Council, 23 Black Rd, Omak, WA. 98841, finch@ncidata.com

Rick Lind, private individual, 885 Hwy 7, Tonasket, WA 98855, rickl@televar.com

George Wooten, Conservation Northwest, P.O. Box 501, Twisp, WA 98856 , gwooten@mymethow.com

Vacant, Oroville Gun and Sportsmen's Club,

APPENDIX 10. 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 11. Grants Received – Source and Amount

Sinlahekin Fuels Analysis- USFS, National Fire Plan –
Sinlahekin Fuels management and Planning – USFWS, National Fire Plan - \$43,000
Conners Lake to Forde Lake Trail – IAC, NOVA - \$100,000
Mule Deer Habitat Enhancement – Mule Deer Foundation - \$7,000
Garbage and Dump Cleanup – DOE/WDFW - \$3,000
Forde Lake to Blue Lake Trail – IAC, NOVA - \$100,000

APPENDIX 12. 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.

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

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)

Western Regional Climate Center (wrcc@dri.edu)

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.%20201C%20CHAPTER/RCW%20%2043%20.%20201C%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 SWA)

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 SWA)

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)

WDFW Habitat Conservation and Recreation Plan 2004 – 2010

WDFW Policies and Procedures

WDFW Strategic Plan (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/>)

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 SWA

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

California floater

Juniper hairstreak

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

Black-backed woodpecker

Blue grouse

Burrowing owl

Cavity-nesting ducks

Chukar

Common loon

Flammulated owl

Golden eagle

Great blue heron

Harlequin duck

Lewis' woodpecker

Loggerhead shrike

Northern goshawk

Peregrine falcon

Pileated woodpecker

Prairie falcon

Ring-necked pheasant

Sage sparrow

Sage thrasher

Sandhill crane

Sharp-tailed grouse

Shorebirds

Vaux's swift

Wild turkey
White-headed woodpecker
Volume V – Mammal (In development by Agency)
Merriam's shrew
Pallid bat
Design of Road Culverts for Fish Passage
(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)
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/>)