# PINE CREEK CONSERVATION AREA

# WILDLIFE HABITAT AND WATERSHED MANAGEMENT PLAN

May 3, 2004
(Revised at the request of BPA September 1, 2004)

**Confederated Tribes of the Warm Springs Reservation of Oregon**

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# I. INTRODUCTION

## A. Summary

Pine Creek Conservation Area is the site of a unique opportunity made possible by mitigation funds from Bonneville Power Administration (BPA). The 24,304-acre ranch was purchased by The Confederated Tribes of Warm Springs in November of 1999, and expanded in September of 2001 with the acquisition of the 9,253-acre Wagner Ranch, providing a total of 33,557 acres. The property offers the possibility of restoring a heavily impacted area to a more highly functioning condition that provides habitats for a variety of native plants and animals.

The issues facing the Conservation Area are diverse and include: encroachment of juniper, non-native annual grasses, and noxious weeds; historic overgrazing and agricultural impacts, altered fire regime, channelization of streams, and declining native fish populations. If significant gains in quality of habitat and water are to be made, it will be through the combined efforts and talents of many people.

This plan includes property goals and objectives, historic and current status, management issues, guidelines for future management, and initial management actions.

## B. Purpose and History of the Project

The Bonneville Power Administration (BPA) is mandated to mitigate for fish and wildlife habitat losses caused by the Columbia River dams. BPA achieves their mitigation program primarily through funding projects that are managed by tribes, conservation organizations, and natural resource agencies. These projects are selected by the Northwest Power and Conservation Council and coordinated as the Columbia River Basin Fish and Wildlife Program.

Tribal leaders of The Confederated Tribes of Warm Springs (Tribes) have long traditions of natural resource stewardship. In 1986, Tribal Council adopted Resolution 7410, mandating the use of an integrated approach to resource planning and management. Two Integrated Resource Management Plans have since been completed for reservation lands, IRMP I for forested lands, and IRMP II for non-forested and rural areas. In these plans, the Tribes have adopted the standard that all management decisions will ensure the protection of water quality, riparian vegetation, fish and wildlife habitat, and cultural resources.

In addition to managing natural resources on their reservation lands, the Tribes are active participants in the management of natural resources throughout their Ceded Lands, where the Tribes retain rights to fishing, hunting, gathering, and pasturing stock. Pine Creek Conservation Area is located near the center of the Tribes' Ceded Lands.

The Tribes identified Pine Creek Ranch as a possible BPA mitigation site in 1997, and by 1998, started the process to secure funds for its purchase. The Tribes took title in November 1999, using Watershed and Wildlife Mitigation funds from BPA.

## C. Purpose of Plan

This document sets forth a Wildlife Habitat and Watershed Management Plan for maintaining and facilitating the recovery of fish and wildlife habitat on Pine Creek Conservation Area. This document will serve as the site-specific management plan called for in Section 3. (b) of the MOA between the Tribes and BPA. The MOA is the primary legal document guiding the Tribes' management of the property. This plan is supplemental to the MOA, and provides further definition to the Tribes commitment to manage the property for fish and wildlife habitat. The acquisition and management of the property is also subject to the National Environmental Policy Act (NEPA) Record of Decision for the Wildlife Mitigation Program (June 18, 1997) and the Compliance Checklist and Supplemental Analysis No. 7 completed for the Pine Creek Ranch acquisition September 14, 1999 and No. 60 for the Wagner Ranch Acquisition August 20, 2001. The MOA also expressly prohibits "all residential, commercial, or industrial uses of the properties that are not permitted in the Plan" (MOA Section 3. e. iii).

This plan is not a comprehensive list of all management actions that may prove necessary to achieve the identified goals. An adaptive management strategy will allow modifications of management techniques after information is gained through monitoring efforts. This plan provides goals and objectives for the property, a description of Conservation Area resources and management issues, initial management actions, and guidelines for future management actions.

Implementation of this plan is dependent upon receiving adequate Operation & Maintenance and Monitoring & Evaluation funding from BPA, to be supplemented by income derived from the management of the land, or other sources as available.

## D. Plan Development Process

The Tribes contracted with Oregon State University's Bioresource Engineering Department to prepare a management plan for the Conservation Area, with Dr. Ron Miner and Denise Hoffert-Hay to lead the project. Mark Berry, Conservation Area Manager, led a 2-day field trip on September 21-22, 2000 for experts in range and water resource management. Denise Hoffert-Hay took notes on conversations, followed up with clarifications, and prepared a summary of management issues and possible strategies. Denise and Mark collaborated in producing a draft management plan which was circulated for peer review by staff from Oregon State University, The Confederated Tribes, Oregon Department of Fish and Wildlife, Bureau of Land Management, and the Nature Conservancy. A revised draft was delivered from OSU on July 15, 2001. OSU published this draft as Special Report 1035 (Hoffert-Hay, 2002).

Prior to public and BPA review of this plan, it became apparent that acquisition of the Wagner Ranch, an adjacent property to be managed as part of the Pine Creek Conservation Area, was likely. Acquisition of Wagner Ranch occurred on September 4, 2001.

This management plan has been amended by Mark Berry to incorporate Wagner Ranch into the property. The draft plan was presented at public meetings in Warm Springs (June 17, 2002) and Fossil (June 26, 2002), and received a favorable review at each meeting. The Columbia Basin

Fish and Wildlife Authority approved the plan on June 20, 2002. BPA reviewed the plan from July to November 2002. BPA's comments were considered in revising the plan. BPA completed a second review October 2003 to April 2004. This version was submitted for final BPA approval on May 3, 2004. After two meetings between tribal and BPA officials, BPA provided a letter on August 3, 2004, specifiying additional requested revisions that have been addressed in this plan.

## E. Plan Amendment and Revision Process

Adaptive management, as noted above, will allow the Tribes to revise management strategies as necessary to achieve the goals and objectives identified in this plan. This Plan may be amended and updated, in a manner that does not modify the stated goals or objectives, by drafting a plan amendment to be appended to this plan. Such amendments will be provided to BPA for their records.

If the Tribes wish to modify the Plan's goals and objectives, or substantially alter the plan in manner that could negatively impact fish and wildlife, they will send a proposed revision to BPA for review and approval.

# II. GOALS AND OBJECTIVES

## A. Overall Goals for the Property

Pine Creek Conservation Area is intended, as a wildlife and watershed mitigation site, to partially offset wildlife habitat losses caused by John Day Dam on the Columbia River. Habitat management will, as specified in the MOA between BPA and the Tribes, to the extent possible, focus on strategies designed to achieve and maintain native habitat that is naturally self-sustaining.

In many cases, recovery of watershed functions or native plant communities may only occur over the course of several decades. Other changes, such as community dominance by invasive species, may be permanent without active intervention on the part of land managers. Future climate changes may also limit or prevent recovery to historic conditions.

Where possible, altered or damaged ecosystem functions will be restored through passive restoration techniques, such as the prevention of activities which degrade or prevent recovery. Passive restoration strategies will be paired with active interventions as needed, such as replacement of culverts creating fish passage barriers. It is hoped that these efforts will lead to conservation of biodiversity in the form of native fish, wildlife, and plant communities.

An additional goal for the project is to work in partnership with neighboring landowners, local, state and federal agencies, conservation organizations, and educational groups. Pine Creek Conservation Area has the potential to serve as a model for watershed recovery and wildlife habitat management in the lower John Day Basin. Successful monitoring of changes to vegetation, wildlife, fish use and distribution and hydrology will be critical to this effort, and collection of baseline data is thus an immediate management priority.

The following objectives describe the overall management direction for the property. The objectives are listed in order of the plan text sections to which they relate. Objectives are numbered for reference to the specific management actions identified in Section XXII of this plan that address them. Note that each objective may be addressed by several management actions, and each management action may contribute to achieving multiple objectives.

## B. Objectives

### Upland Areas (Section VII)

1. Maintain a diverse, dynamic mosaic of native vegetation communities and wildlife habitats. Maintain or increase the extent of native bunchgrass and shrub steppe communities.

2. Maintain appropriate vegetation for healthy watershed function, including infiltration, storage, and release of water to maintain or improve water quality, water quantity and the timing and duration of flow.

3. Allow the occurrence of natural disturbance processes within their range of natural variability and the practical constraints of limited land area and altered ecological potential.

4. Reduce ongoing encroachment of western juniper into bunchgrass and shrub steppe habitat types. Reduce the impacts of juniper encroachment on watershed hydrology. Maintain a diversity of western juniper age classes and habitat structural conditions.

## Riparian Habitat Areas (Section VIII)

5. Facilitate recovery of riparian systems in Proper Functioning Condition (Prichard, 1998) that will allow development of desired habitat characteristics.

6. Provide quality aquatic and riparian habitats for native fish and wildlife, within their natural potential.

7. Establish functioning riparian buffers and wildlife habitat by restoring key native vegetation species in abandoned agricultural fields adjacent to Pine Creek and the John Day River.

## Listed Species (Section IX)

8. Protect habitats of all listed species as appropriate.

## Wildlife and Fish (Section X)

9. Manage for native habitats that will sustain populations of diverse native wildlife species, while providing continued hunting opportunities for tribal members and the public.

10. Protect, maintain, or increase local populations of native steelhead and redband trout (*Oncorhynchus mykiss*) by allowing natural recovery of habitat.

11. Eliminate artificial fish passage barriers by replacing problem culverts with appropriate structures.

## Water Rights (Section XI)

12. Restore irrigation water rights to instream flows. Utilize water rights on an interim basis as needed to achieve management objectives, including establishment of desired vegetation in floodplain fields.

## Cultural and Historic Resources (Section XII)

13. Protect cultural and historic resources and avoid impacts to these resources from management activities.

## Introduced Plant Species Management (Section XIV)

14. Minimize the impacts of introduced species on native vegetation and hydrological function.

15. Reduce the potential spread of noxious weeds to uninfested areas and neighboring lands.

## Grazing and Fences (Sections XV & XVI)

16. Allow habitat recovery to occur prior to any managed livestock grazing on deeded lands. Utilize livestock grazing only as a wildlife habitat management tool, in conjunction with this plan and/ or future revisions. Coordinate management of Spring Basin and Amine Peak BLM grazing allotments with Prineville District BLM.

17. Work with neighbors to maintain or replace boundary fences as necessary to minimize trespass grazing.

18. Reduce the impact of interior fences on natural movement patterns of wildlife.

## Roads (Section XVII)

19. Minimize impacts of roads, including erosion and weed dispersal. Maintain only road segments necessary for management access to property. Allow unnecessary road segments to revegetate.

## Fire Management (Section XVIII)

20. Allow wildfires to play a role in the restoration and maintenance of native upland habitats, while taking into consideration concerns of neighboring landowners.

21. Utilize prescription fires in a safe and appropriate manner to benefit native habitats, e.g., by minimizing juniper encroachment.

## Tribal and Public Access (Section XIX)

22. Allow regulated tribal and public access. Restrict access or activities that may harm natural resources or interfere with achievement of management objectives.

## Land Exchange (Section XX)

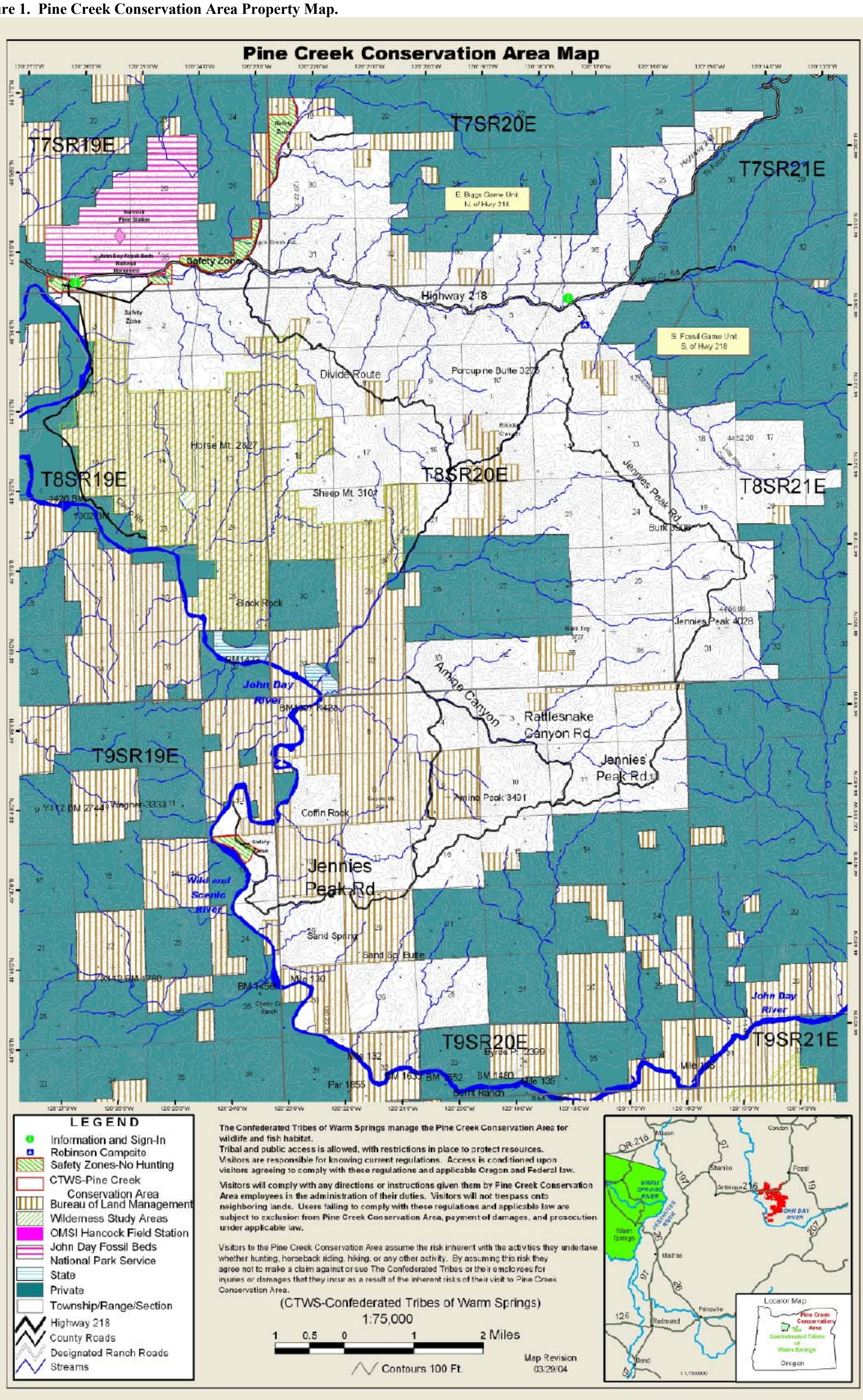
23. Work with the Prineville District BLM to achieve an equal-value land exchange that would consolidate Conservation Area habitat and facilitate management of tribal and public lands.

## Monitoring and Evaluation (Section XXI)

24. Accurately monitor and evaluate changes in riparian conditions, upland vegetation, and wildlife habitats, and fish and wildlife use. Document the effects of management actions. Facilitate increased understanding of ecosystem recovery processes and potentials.

25. Encourage natural sciences research and educational activities.

**Figure 1. Pine Creek Conservation Area Property Map.**



# III. WATERSHED OVERVIEW AND OWNERSHIP

Pine Creek Conservation Area is located in the Clarno Basin in the John Day Ecological Province of Eastern Oregon (Figure 1). The Conservation Area is bordered to the west by the by the John Day River and Spring Basin Wilderness Study Area, managed by the Prineville District of the Bureau of Land Management (BLM). The Clarno Unit of the John Day Fossil Beds National Monument, managed by the National Park Service (NPS), is to the northwest of the Conservation Area. The eastern portion of the Conservation Area is bordered by privately owned land.

Wagner Ranch adjoins the eastern portion of the southern boundary of the original Pine Creek Conservation Area purchase, and extends south and west to the John Day River. Together with the Amine Peak BLM grazing allotment, Wagner Ranch encompasses 9.8 miles of the East bank of the John Day River.

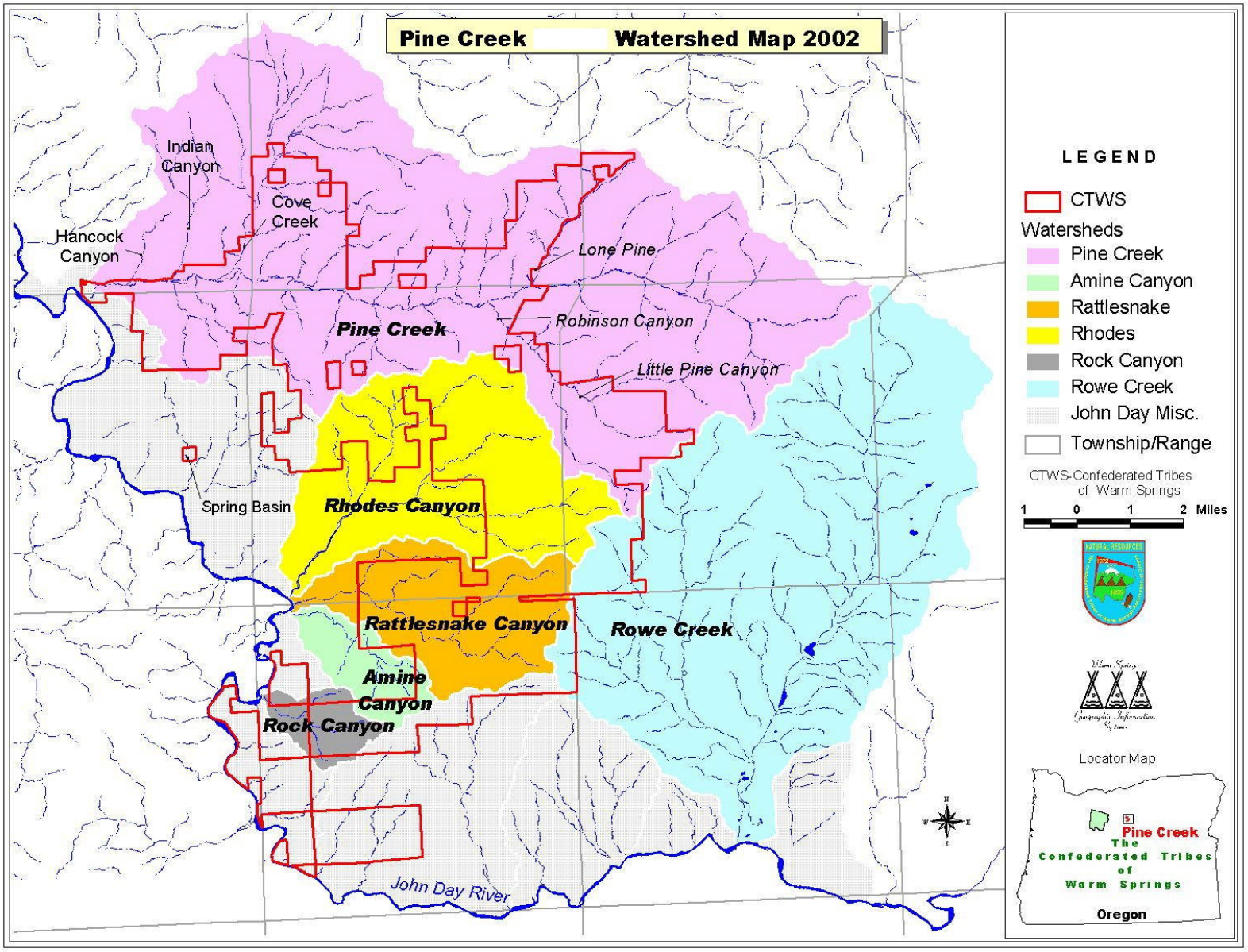
The entire Conservation Area lies within the watershed of the lower John Day River (USGS Cataloging Unit: 17070204). The primary sub-watersheds within the Conservation Area are Pine Creek and Rhodes Canyon, within the original Pine Creek Ranch purchase, and Rattlesnake, Amine, and Rock Canyons within the Wagner Ranch (Figure 2; Table 1).

**Table 1. Watershed Ownership**

| Watershed Units: | Sub-watershed | Size Acres | CTWS ownership Acres/% of total | Other ownership | Comments |
|---|---|---|---|---|---|
| Pine Creek | All | 41,701 | 15,382 (37%) | | Confluence at John Day River T8SR19E Sec.4 |
| Pine Creek Tributaries | Cove Creek | 8,541 | 1,545 (18%) | BLM (649) Private owners (6,347) | Largest sub-watershed of Pine Creek |
| | Lone Pine Creek | 2,191 | 1,133 (52%) | BLM (40) Private (1,018) | Pine Creek Headwaters above Lone Pine not on Conservation Area |
| | Indian Canyon | 1,790 | Outside Conservation Area boundaries | John Day Fossil Beds National Mnmt. (33%) | |
| | Hancock Canyon | 1,028 | Outside Conservation Area boundaries | John Day Fossil Beds National Mnmt. | |
| | Robinson Canyon | 6,025 | 3,321 (with Little Pine Canyon) | Private (2,704) | Largest southern Pine Creek trib. |

| | | | | | |
|---|---|---|---|---|---|
| | Little Pine Canyon | 3,110 | 1,360 | Private (1,750) | Tributary of Robinson Canyon |
| Rhodes Canyon | All | 10,940 | 6,814 (62%) | BLM (2,071) Private (2,026) | Confluence at John Day River T8SR20E Sec.31 |
| Rattlesnake Canyon | All | 6,176 | 4,922 (80%) | BLM (810) Private (417) | Tributary to John Day River upstream from Rhodes Canyon |
| Amine Canyon | All | 2,000 | 564 (28%) | BLM (1,436) | Tributary to John Day River upstream of Rattlesnake C. |
| Rock Canyon | All | 1,385 | 821 (59%) | BLM (564) | Tributary to John Day River upstream of Amine Canyon |
| Rowe Creek | All | 29,942 | 1306 (4.4%) | Private (27,694) | Tributary to Dry Hollow |
| Other Tributaries & John Day River | All | NA | 4,624 | NA | Minor tributaries from Spring Basin Canyon upstream to Shaw Canyon |

**Figure 2. Pine Creek Conservation Area Watershed Map.**



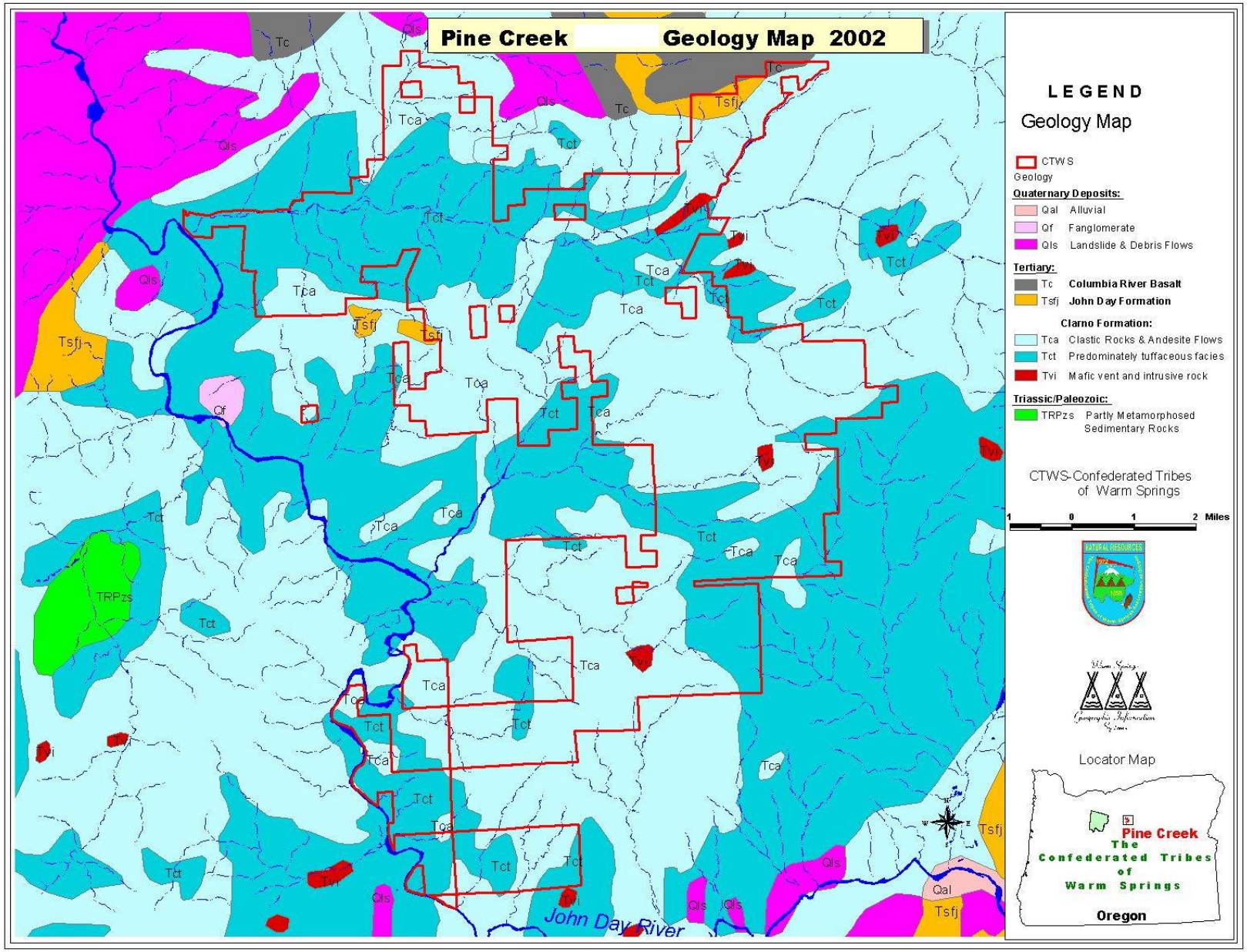
# IV. GEOLOGY AND TOPOGRAPHY

The geologic record of the Conservation Area spans a period from approximately 54 to 12 million years ago (Figure 3). The majority of the Conservation Area is within the Clarno Formation, which includes lavas, mudflows, and tuffs formed by widespread volcanic activity between approximately 54 and 37 million years ago.

The Conservation Area also includes areas within the John Day Formation and the Columbia River Basalts. The John Day Formation lies atop the Clarno Formation, and is largely the product of accumulations of volcanic ash from eruptions near the present-day Cascade Range between 37 and 20 million years ago. The Columbia River Basalt Group is the product of flood basalts formed between 19 and 12 million years ago, which form the vast lava plains of north central Oregon.

The Conservation Area lies within an area of generally steep and rugged topography (Figure 1). Numerous canyons dissect remnants of plateaus, leaving little flat terrain. Floodplains exist along major streams and the John Day River, but occupy a small percentage of the land area. Elevations on the property range from slightly over 4,000 feet to approximately 1,300 feet at the mouth of Pine Creek.

**Figure 3. Geology Map.**



# V. CLIMATE

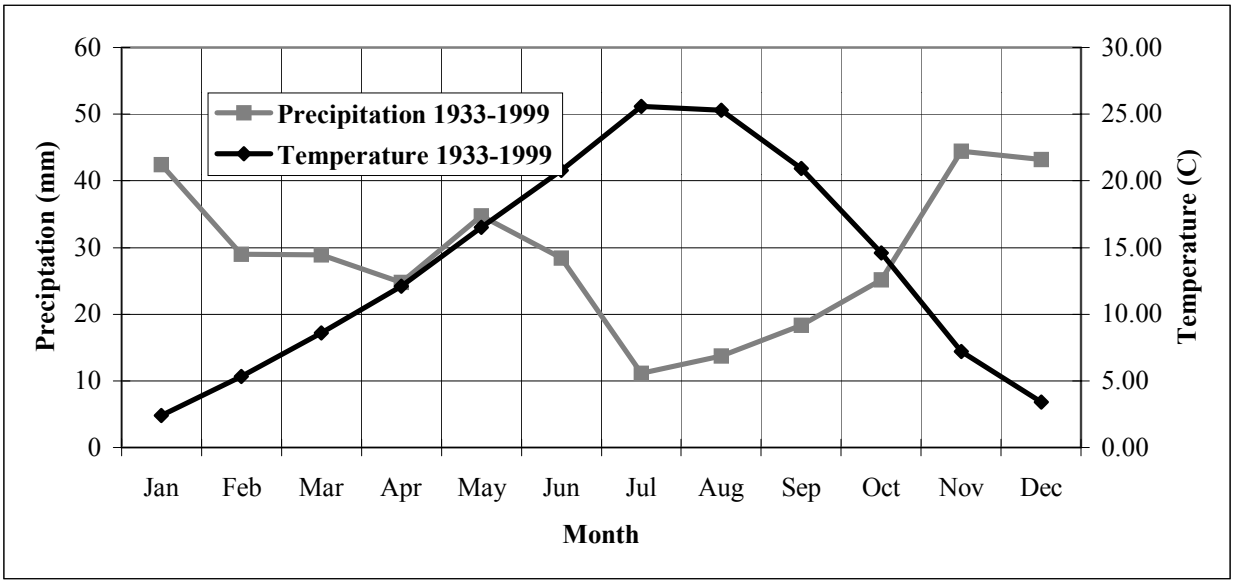
## A. Climate Records

Pine Creek Conservation Area is located near the boundary between Oregon's North Central and South Central Climate Zones. The area is semi-arid, with average annual precipitation ranging between 10" and 16" depending upon elevation, slope, and aspect.

No climate record is available from the Conservation Area. The nearest two National Weather Service monitoring stations are located in Antelope (1NW Antelope) and Fossil. The Antelope station is at 865.6 meters (2840 feet) and the Fossil station is at 807.7 meters (2650 feet). These elevations fall near the middle of the range of elevations on the Conservation Area.

The Antelope station has a more complete data record (missing / incomplete data for 27 out of 912 months) than the Fossil station (missing / incomplete data for 155 out of 792 months). The Fossil station has also changed location three times in the past 70 years (Hannan, 2000), clouding interpretation of patterns of variation.

**Figure 4. Climatic Diagram for Antelope, OR Average Values 1933-1999**

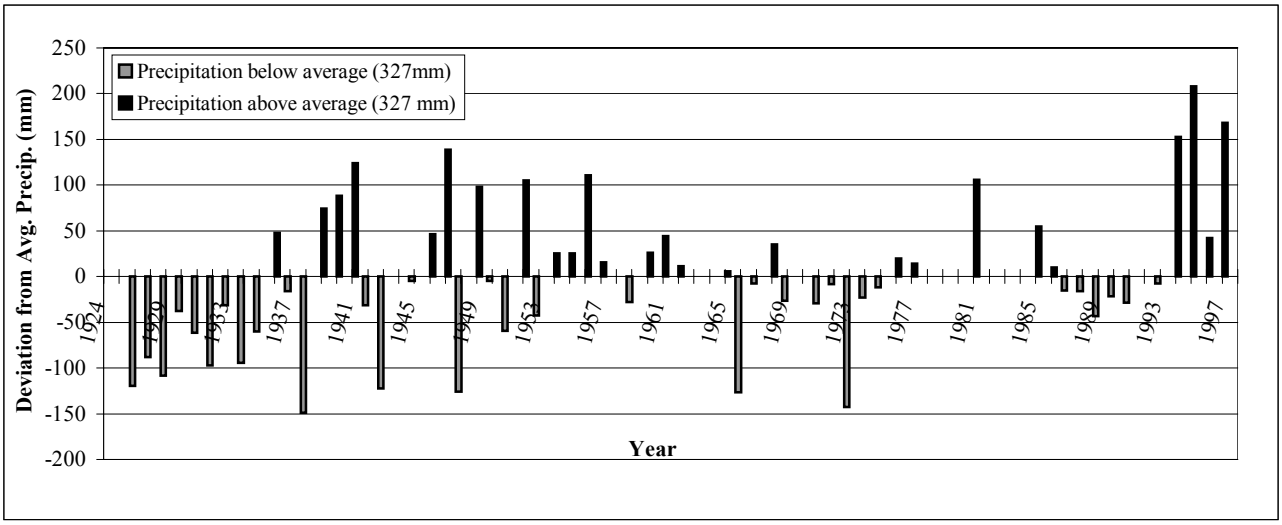



Most of the precipitation in the area falls in the form of rain during the months of November, December and early January. There is another pulse of moisture in the late spring from mid-April to mid-May (Figure 4). Average temperatures reach their peak in July and August, and water deficits, with evaporation demands greater than available moisture, typically exist from June through September.

The average precipitation at the Antelope station is 327 mm. Precipitation amounts are highly variable from year to year, however. Out of 75 years of record, 33 are below this average, 25 are

above, and 17 years could not be included due to missing data (Figure 5). A paleoclimate tree-ring analysis provides a record of annual variations in growing conditions from 1704 to1900 (Garfin, and Hughes 1996) (Figure 6). The average precipitation of the tree-ring dataset from 1704-1900 is only 17 mm different from the average measured values from the years 1933-1999. This record also demonstrates dramatic inter-annual variability.

**Figure 5. Deviation from Average Annual Precipitation from 1924-1998 at Antelope, OR.** Data from Oregon Climate Center




## B. Implications for Recovery and Restoration

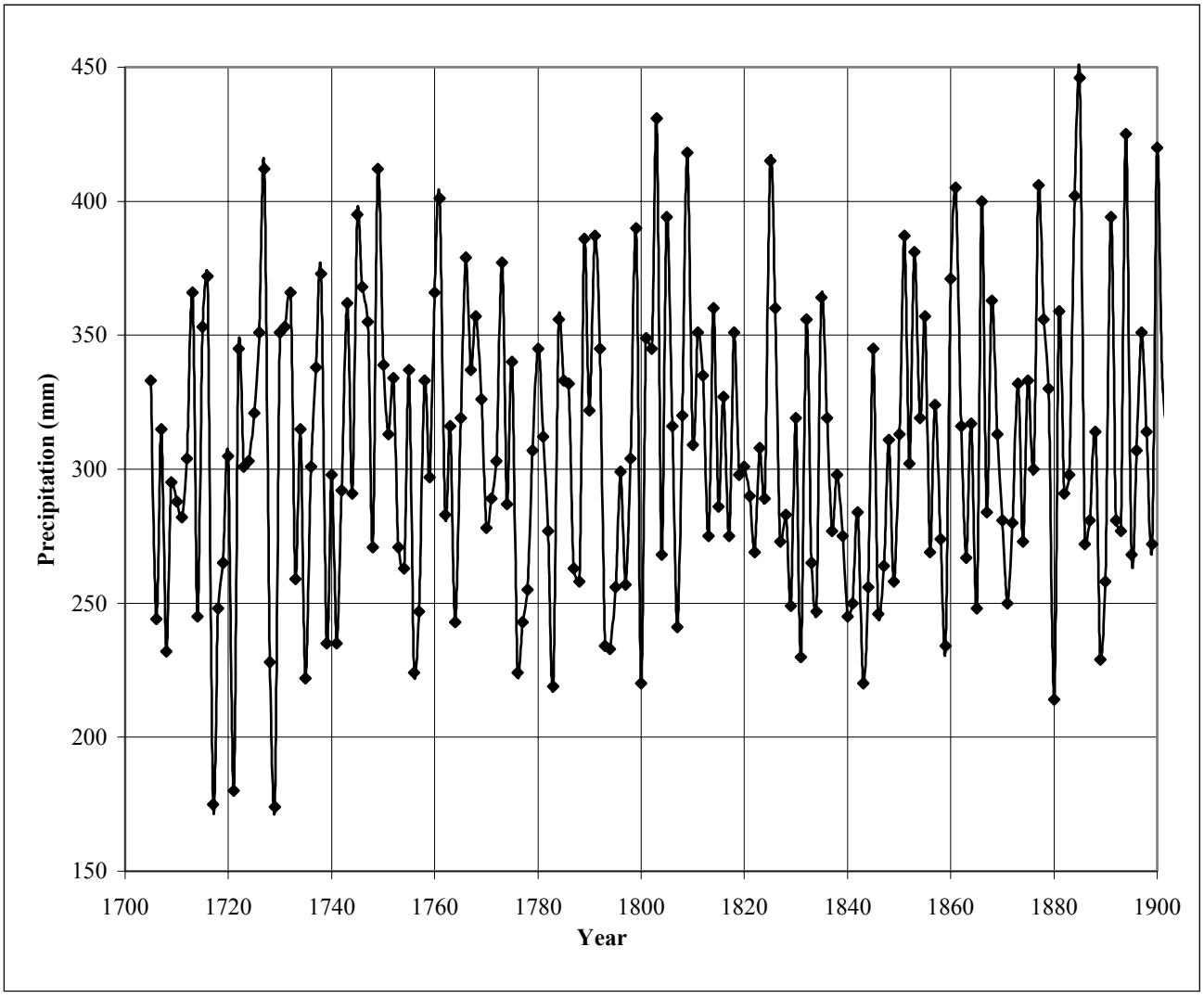
The variability of annual precipitation increases the challenge of planning restoration projects. Potential recovery and restoration of vegetation is influenced by available moisture and temperature. Seeding and planting projects rely directly on appropriately timed available moisture. A lack of available moisture is a direct limiting factor for seed germination, emergence and establishment (Eddleman, 2000). Projects must be planned with an understanding of climate variability and its implications for probable success or failure.

Variation in annual precipitation and temperature has great significance for fire management on the Conservation Area. Potential wildfires or controlled burns are influenced by precipitation patterns. The use of prescribed burns in this system is limited by the availability of sufficient fuels to carry the burn. The amount of combustible fuel is a function of how much plant material is on the site and the type of material (i.e. grass, shrubs, or juniper trees). The vegetation growth is directly influenced by precipitation. In a year with above average precipitation, there is increased plant growth, which increases the fuel loading of the system. During dry or drought years, there is less vegetation, which decreases the ability to write a fire prescription for the area (Eddleman, 2000).

Finally, it cannot be assumed that future variations in climate will remain within the pattern of the past climate record. Climate change over the coming decades due to natural variations or

greenhouse gases can be expected to influence the vegetation communities throughout the region.

**Figure 6. Tree-Ring Reconstructed Precipitation for Eastern Oregon**
(Data from Garfin and Hughes, 1996)



# VI. SOILS

A detailed soil survey of the Conservation Area has not been conducted, and there is no complete soil survey for Wheeler County. A survey was conducted using the "old" range site classifications under prior ownership, and the data is available at the NRCS in Condon. These soil classification approximations were used to derive a table of Soil Series names with associated brief descriptions (Table 2). The NRCS recently completed a soil survey of the John Day Fossil Beds National Monument, which will provide an excellent reference for comparison with the Conservation Area.

The soils on the Conservation Area are mostly clays with a high component of gravel. They are generally described as well drained with moderate to rapid runoff and low to moderate permeability. Some areas have a calcareous lower horizon that may create favorable conditions for juniper expansion.

Soils indicate the potential plant communities that would exist on the property. The Conservation Area's soils may no longer support the vegetation they did historically due to erosion. The soil profile in many places may be lacking the upper, or A, horizon. Without an inventory it is not possible to know the extent of past soil loss from the property.

**Table 2. Soil Types**

| Soil Series (NRCS Classification) | Soil Description | Associated Vegetation | Historic/current Use | Geographic setting | Comments |
|---|---|---|---|---|---|
| Lickskillet | Shallow, well-drained soils that formed in **stony** colluvium consisting of loess, rock fragments and residuum weathered from basalt and rhyolite. | Bluebunch wheatgrass, Sandberg bluegrass, Thurber needlegrass, western yarrow, and Wyoming big sagebrush | Livestock grazing. Watershed, recreation, wildlife habitat. | Uplands | High stone content limits types of equipment for seeding, plowing, etc. |
| Hack | Deep, well drained soils formed in alluvium from mixed sources. | Bluebunch wheatgrass, Idaho fescue and big sagebrush. | Irrigated grass, alfalfa hay, irrigated pasture and range. | On low alluvial fans, terraces and footslopes. Slopes of 3 to 20 percent. | Likely productive soils. Good place to do seeding projects with irrigation. |
| Day | Deep, well drained soils formed in clayey sediments from the John Day Formation. Parent material clay with calcareous sediments. | Bluebunch wheatgrass, giant wildrye, basin big sagebrush, and shadscale. | Livestock grazing and wildlife habitat. | On fans and dissected uplands with irregular topography. | Slow draining, clay holding water for more of the year. Good sites to restore basin wildrye. |
| Sorf | Moderately deep, well drained soils on foothills. Formed in mixed loess and colluvium over fine textured colluvium and residuum from sedimentary rock or tuff. | Antelope bitterbrush, bluebunch wheatgrass, Idaho fescue, Sandberg blue grass and big sagebrush. | Livestock grazing and wildlife habitat. | Nearly level to steep side slopes at elevations 1,200 to 2,800 feet. | At depth, very high pH, calcareous tuff, susceptible to juniper. (See juniper section for discussion). |
| Simas | Very deep, well-drained soils formed in loess and colluvium from tuffaceous sediments. | Bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass and Wyoming and basin big sagebrush. | Livestock grazing and wildlife habitat | On hills at elevations of 1,200 to 4,000 feet. At high elevations, only on south facing slopes. | Alkaline, see Sorf above. |

| | | | | | |
|---|---|---|---|---|---|
| Waterbury | Shallow, well-drained soils that formed in material weathered mainly from basalt and tuff. | Bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, low sage, and antelope bitterbrush. | Livestock grazing and wildlife habitat | Uplands, at elevations of 1,800 to 4,600 feet. At higher elevations, only on south facing slopes. | Only 14 inches to bedrock (basalt). Very shallow, makes water storing capacity low, possible areas of subsurface runoff during large storms. |
| Powder | Very deep, well-drained soils formed in mixed alluvium. | Giant wildrye, bunchgrasses and forbs. | Irrigated row crops, small grains, potatoes, and alfalfa. | On bottomlands and alluvial fans. Elevations from 500 to 3500 feet. | Historically highly productive soils (may have lost productivity due to erosion during floods when under cultivation). |
| Donnelly | Very deep, somewhat excessively drained soils formed in micaceous silt loess overlying sand and gravel. Sandy-skeletal. | Native white spruce, paper birch, quaking aspen forest. | Some areas used for small grains, hay and pasture. | On outwash plains and moraines. | Gravel and rocks at depth of 7 to 60 inches. No water holding capacity. |
| Snell | Moderately deep, well-drained soils that formed in a mixture of loess and basaltic colluvium. | Bluebunch wheatgrass, Idaho fescue, and Sandberg bluegrass. | Livestock grazing and wildlife habitat. | Canyon walls, 2,000 to 6,800 feet mainly on north and east exposures. | High stone content in A horizon (top 4 inches 20% stones). Equipment use difficult. |
| Tub | Deep and very deep, well-drained soils formed in old sediments of volcanic origin. | Bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, and related forbs. | Small grains and livestock grazing. | Hilly uplands at 2,600 to 4,500 feet. | |
| Curant | Fine-silty, well-drained formed of old alluvium or colluvial material from sedimentary and igneous rocks of mixed mineralogy. | Idaho fescue, bluebunch wheatgrass, Sandberg bluegrass. Forbs: yarrow, lupine, arrowleaf balsamroot, carrot, milkvetch. | Grazing, wildlife habitat and recreation. | North aspects of slopes 2,200 to 3,700 feet. | |
| Wrentham | Moderately deep, well-drained soils formed in loess with colluvium weathered from basalt. | Idaho fescue, bluebunch wheatgrass, Sandberg bluegrass, forbs and shrubs. | Grazing and wildlife habitat. | North facing canyon slopes. | |

# VII. UPLAND HABITAT AREAS

## A. Description of Natural Conditions

It is difficult to describe conditions of upland habitats prior to European settlement in great detail, as major changes in upland vegetation have been observed within the last 140 years. Natural conditions can be inferred from historic accounts, soil classifications, and current vegetation. Soils and associated vegetation for the Conservation Area are described in Table 2.

According to the 1936 State of Oregon Forest Type Map, the Conservation Area area was non-forested with primarily sagebrush-grassland and less than 10% juniper cover (Anderson et al., 1998). Lack of western juniper is particularly noticeable in the John Day River drainage where only scattered stands existed in the late 1930s. Soil-plant relationship studies in the John Day Province indicate that nearly all non-forested sites were natural shrub-grasslands originally and indicate only a 10% canopy cover of shrubs.

From these sources, it is clear that bunchgrass grasslands and sagebrush steppe dominated Conservation Area uplands. Bluebunch wheatgrass would have been dominant on south facing slopes, with Idaho fescue prevalent on north slopes. Basin big sagebrush would have been most common on foot slopes and well-drained areas on valley floors.

Juniper woodlands were present in the area, as indicated by scattered old trees remaining on the property and historical accounts, but were not nearly as extensive as they are currently. Shrub communities of mountain mahogany, bitterbrush, and other species occurred on rocky slopes and in some canyon bottoms. Ponderosa pine and Douglas-fir forests would have been present on north-facing slopes at the highest Conservation Area elevations. Spring sources would have supported riparian vegetation, including aspen (at higher elevations), cottonwoods, and willows.

Wild fires presumably occurred relatively often, with ignitions from lightning strikes or Native Americans deliberately setting fires. These fires served to maintain open grasslands, preventing the spread of western juniper, and maintaining a mosaic of sagebrush and bunchgrass dominated areas. Fire frequency for the Conservation Area property is not known, however, mean fire return intervals of 12 to 15 years have been documented for a watershed in south central Oregon between 1601 and 1897. (Miller & Rose, 1999) Fire return intervals on portions of the Conservation Area would presumably have ranged from this low figure to 35 - 50 years.

## B. Historic Impacts

The dominant initial land use in the local area was livestock grazing, including both sheep and cattle. Major operations were established prior to and during the homestead era, which began locally in the 1860s. Livestock numbers peaked in the early 1900s, and impacts to rangeland and riparian areas were severe.

The most significant change in upland areas has been a major increase in the extent of western juniper woodlands, generally attributed to overstocking of domestic livestock, reduced fire

frequencies, and climatic conditions during the 1800s (Miller & Rose, 1999). In the 1960s, Larry Haverfield and Bill Anderson observed the juniper north of the mainstem John Day River increasing rapidly (Anderson, et al., 1998). In a study of the growth rings along a transect from the river north to the forest boundary on top of the main ridge, showed increasing age classes from the river to the ridge top. This study also showed the expansion of juniper started in the early 1900s. The very old junipers were likely protected from wildfire by a lack of surface fuel.

Grazing activities have also contributed to the spread of invasive annual grasses, most notably cheatgrass and medusahead, throughout upland grasslands. Later construction of roads and motor vehicle use has increased soil erosion and the spread of annual grasses and noxious weeds.

The creation of stock-watering ponds and spring tanks, which helped keep livestock in upland areas and away from creeks or the river, had the additional effects of altering hydrologic patterns and causing localized soil disturbance and weed establishment.

The timbered area in upper Little Pine Canyon was recently logged, with most large ponderosa pine and Douglas-fir trees removed. A road was constructed through the canyon bottom of upper Little Pine Canyon for timber removal.

## C. Assessment of Current Conditions

### 1. Grasslands

Grassland habitats are currently widely distributed on the Conservation Area. The July 2000 Landsat vegetation classification included 2,732 acres of grassland in the original Pine Creek portion of the Conservation Area. An additional 3,086 acres burned in the July 2000 "Two Horse Fire", most of which would now be classified as grassland or scattered juniper due to mortality of juniper in the fire.

Grasslands on the Conservation Area fall within two of the 30 habitat types used by the Atlas of Oregon Wildlife (Csuti, et al, 1997): Perennial Bunchgrass and Idaho Fescue Grasslands. The primary difference is an increased occurrence of shrubs and juniper in the Perennial Bunchgrass type. Dominant native grass species on the Conservation Area are bluebunch wheatgrass, Idaho fescue, and Sandberg's bluegrass. Other native grass species include bottlebrush squirreltail, sand dropseed, and a variety of species associated with more mesic conditions. A diverse assemblage of forbs is present, and cryptobiotic crust occurs between bunchgrass clumps.

The greatest concentrations of grassland habitats occur in the Chichester Pass uplands, the plateau to the north of Spring Basin within the fire area, the Cove Creek area, and lower elevation portions of the Wagner Ranch. Grasslands also occur in smaller patches throughout the property, and a great portion of the area that is currently juniper woodland would historically have been grassland.

Conservation Area grasslands conditions vary greatly. Cheatgrass, medusahead, and bulbous bluegrass, all introduced annual grasses, are widespread. In many areas these species have replaced the native bunchgrasses. Introduced annuals are most frequent in areas that have

experienced heavy disturbance. In general, lower portions of slopes are in worse conditions than higher areas, and south facing slopes are in worse condition than north facing slopes. Flats and saddles, along with historic corral sites, tend to be in the worst condition. In many of these areas, cheatgrass and medusahead are dominant to the near exclusion of all native species. Native grasses, forbs, and cryptobiotic crust species are all susceptible to invasion by these annual grasses. Grasslands are also susceptible to invasions by noxious weeds. At this point, noxious weed infestations on the Conservation Area are largely confined to riparian floodplain fields and Conservation Area roads, but these infestations have potential to spread into grasslands.

The other major challenge to restoring native grasslands on the Conservation Area is encroachment by western juniper. While juniper is a native species, it has increased its extent dramatically since European settlement, primarily into shrub and bunchgrass communities. While juniper has encroached on thousands of acres on the Conservation Area, many grassland areas are now occupied by scattered individual junipers, or by young trees at moderate density. These areas retain most of their native species, and could potentially return to grassland.

Native bunchgrass communities are thought to provide greater infiltration of precipitation than annual grasslands or juniper woodlands, thus recharging groundwater supplies and improving watershed function. Native bunchgrasses evapotranspire less water than juniper, and leave more water available to reach riparian areas or provide groundwater and soil moisture storage. Juniper management will be discussed in the Juniper Woodland habitat section.

Grasslands are an important component of wildlife habitat on the Conservation Area, providing habitat for small mammals, songbirds, raptors, and other species that require grassland habitats for reproduction or foraging. The quality of grassland as wildlife habitat is diminished by the invasion of annual grasses. Grasslands are a high priority wildlife habitat on the Conservation Area because
they are regionally threatened to a greater extent than juniper woodlands.

## 2. Sagebrush Steppe

Sagebrush is currently widespread on the property, although there are few extensive areas of sagebrush-dominated steppe. Sagebrush areas are likely included within the grassland and/or scattered juniper cover types in the 2000 Landsat vegetation classification of the Conservation Area.

Sagebrush areas on the Conservation Area fall within three of the 30 habitat types used by the Atlas of Oregon Wildlife (Csuti, et al, 1997): Big Sagebrush, Low Sagebrush, and Mixed Sagebrush.

Big sagebrush (*Artemisia tridentata*) is most common in deep soils of valleys and alluvial fans that have not been recently plowed or burned, although it also occurs on slopes with moderate soil development. The understory includes a variety of native bunchgrasses and forbs, or introduced pasture grasses or annual grasses. Scattered juniper commonly occurs in big sagebrush areas. Basin big sagebrush (*A. t.* subsp. *tridentata*) is dominant on lower elevation sites with deep soils, while Wyoming big sagebrush (*A. t.* subsp. *wyomingensis*) may occur on

drier slopes, and mountain big sagebrush (*A. t*. subsp. *vaseyana*) may occur on high elevation moist soils. These subspecies can be useful indicators of site potentials, and vary in their value to wildlife.

Low sagebrush (*A. arbuscula* and / or *A. rigida*) communities are found on ridge tops, plateaus, or gentle slopes typically on shallow, rocky soils. Sandberg's bluegrass and a variety of native forbs are common in the understory. Where low sagebrush occurs in saddles with adequate soil development, cheatgrass and medusahead are often present.

The mixed sagebrush habitat type is composed of a mosaic or mixture of sagebrush species. Basin big sagebrush and low or stiff sagebrush rarely occur as a mixture on the Conservation Area, but they are often in close proximity. Some areas may appear as "mixed sagebrush" if mapped.

As with grasslands, sagebrush habitats vary greatly in their current condition. Low sagebrush communities are relatively intact, although they occupy a very small acreage of the Conservation Area. These communities provide habitats for native plants that do not occur in deeper soil areas. Basin big sagebrush habitats are presumably highly altered from their historic condition and locations. Basin big sagebrush was likely a dominant species in the floodplains along Pine Creek, which are currently occupied by agricultural fields and pasture grasses. Basin big sagebrush often dominates within the boundaries of historic corrals associated with homesteaders' or herders' cabins, often in association with introduced grasses. Basin big sagebrush is common in some riparian areas that presumably would have been occupied by riparian trees and shrubs originally. Basin big sagebrush remains widespread on slopes throughout the Conservation Area.

Sagebrush habitats are also vulnerable to encroachment by western juniper, and basin big sagebrush habitats were likely among the first areas to become dominated by juniper. Sagebrush, like juniper, can increase under conditions of heavy grazing and reduced fire frequencies. Sagebrush is much more vulnerable to fire than mature juniper, but reproduces from seed more rapidly after a fire.

## 3. Juniper Woodland

Juniper woodland is currently widespread on the Conservation Area, and dominated by stands of younger age class trees. Scattered individual, and occasional patches, of older trees occur primarily on rocky sites with low fire frequencies. The Landsat vegetation classification for the Conservation Area describes three juniper cover types: Dense juniper woodland, Moderate density juniper woodland, and Scattered juniper.

| | Original Pine Creek Ranch Purchase | |
|---|---|---|
| Cover Type: | Acres: | Percent: |
| Dense Juniper Woodland | 5,152 | 21% |
| Moderate Density Juniper Woodland | 8,014 | 33% |
| Scattered Juniper | 6,718 | 28% |

These cover classes have not been ground-truthed, but can be coarsely related to a juniper classification presented in a 1997 Western Juniper Forum. Dense juniper woodland presumably corresponds to Closed Stand or Late Transitional conditions, while Moderate Density Juniper Woodland likely describes primarily Mid Transitional stage stands. These stand descriptions will not correlate perfectly with observed densities, due to variation in site potentials and histories.

The Two Horse Fire burned approximately 3,086 acres of the Conservation Area in July 2000, including a mosaic of juniper woodlands and grasslands. Juniper mortality as a result of this fire will result in conversion of a portion of the juniper woodlands in this area to grasslands. The Two Horse Fire area is not included in the above Juniper cover types, but some of this area will remain juniper woodland.

In the absence of fire, juniper encroachment into open areas can be expected to increase, while stand closure of existing stands increases. The entire property is likely susceptible to juniper encroachment. Using the acreage percentages above as a starting point, we can make some rough assumptions about the likely progress of juniper encroachment in the absence of fire (however, wildfires are inevitable, and prescription fires are planned to forestall juniper encroachment). It should also be noted that juniper encroachment is not likely to proceed in a linear fashion due to varying seedling establishment rates with varying annual precipitation.

If we assume that 10% of each class of juniper woodland transitions into the next density class each 10 years, the following percentages of each class would result:

| Year | 2000 | 2010 | 2020 | 2030 | 2040 | 2050 |
|---|---|---|---|---|---|---|
| Dense | 21% | 24% | 28% | 31% | 34% | 37% |
| Moderate | 33% | 33% | 32% | 31% | 31% | 30% |
| Scattered | 28% | 27% | 26% | 25% | 24% | 22% |
| Open | 18% | 16% | 15% | 13% | 12% | 11% |

However, if we assume that 20% of each class transitions to the next density:

| Year | 2000 | 2010 | 2020 | 2030 | 2040 | 2050 |
|---|---|---|---|---|---|---|
| Dense | 21% | 28% | 34% | 40% | 46% | 52% |
| Moderate | 33% | 32% | 31% | 29% | 28% | 26% |
| Scattered | 28% | 26% | 24% | 21% | 19% | 17% |
| Open | 18% | 14% | 12% | 9% | 7% | 6% |

These calculations suggest that if no fires were to occur over the next 30 to 50 years, almost all of the Conservation Area would support juniper woodland in varying stages of development. This would represent a nearly complete loss of open grasslands and shrub steppe habitats without juniper trees. There would presumably be associated severe impacts to watershed function, riparian habitat, and aquatic habitat.

**Table 3. Juniper Classification System:**
Key Characteristics of Western Juniper Woodland Successional Stages

| Key Characters | Early Transitional | Mid Transitional | Late Transitional | Closed Stand |
|---|---|---|---|---|
| **Tree canopy** | Open; canopy cover <5%; expanding | Canopy cover 6-20% actively expanding | Canopy cover 21-35%; canopy expansion greatly reduced | Canopy cover >35%; canopy expansion stabilized |
| **Leader growth (dominant trees)** | Good terminal and lateral growth | Good terminal and lateral growth | Good terminal growth reduced lateral growth | Good to reduced terminal growth; no lateral growth |
| **Crown lift (lower limb die-off) (Dominant trees)** | Absent | Absent | Reduced lateral growth of lower limbs | Present (for productive sties) |
| **Potential berry production** | Low | Moderate to high | Low to moderate | Scarce to low |
| **Tree recruitment** | Active | Active | Reduced; limited to within drip line | Absent |
| **Growth (Understory trees)** | Good terminal and lateral growth | Good terminal and lateral growth | Greatly reduced terminal and lateral growth; reduced ring growth | Absent: some mortality; greatly reduced ring growth |
| **Shrub layer** | Intact | Nearly intact to showing mortality around dominants | >40% mortality | >85 |

From: Western Juniper Forum 1997 Proceedings, PNW-GTR-432

**Habitat Impact of Juniper Encroachment**

As noted in Table 3, increasing stand closure of juniper results in mortality within the shrub understory, and loss of native bunchgrasses and forbs. The loss of native vegetation elements and the structural change of adding juniper to bunchgrass or sagebrush steppe communities results in the loss of the characteristics that defined the original communities and wildlife habitats. Grasslands and sagebrush steppes are severely impacted throughout the Intermountain Region by conversion to agricultural use and encroachment by juniper.

**Hydrologic Impact of Juniper Encroachment**

Alteration of uplands from grasslands or sagebrush steppe to juniper woodlands may have significant consequences for the hydrologic characteristics of the watersheds. Water consumption by western juniper is potentially much greater, on both a spatial and temporal scale, than that of the communities it replaces. This increased water use may result in decreased water availability to riparian areas.

Al Winward has suggested that only in areas receiving more than 15" annual precipitation will juniper encroachment in upland areas likely result in reduced stream flow, because all precipitation in areas receiving less than 15" annually is probably used by local vegetation and soil, and not available to riparian areas (Winward, 2001). However, late fall and winter precipitation would not be utilized by any vegetation other than juniper so the soil moisture storage is depleted by juniper year-round.

Juniper-dominated watersheds have shortened response times to rainfall events and streams are now flashier than they were historically. Increases in bare soil and loss of understory vegetation decrease water infiltration during precipitation events and increase surface runoff. The high runoff during storm events increases the velocity of the water during those events and increases soil loss in stream channels, leading to incision. Increased surface flow results in decreased groundwater recharge, which decreases stream flows later in the year. Summer stream flow has become even more critical with the loss of habitat for native salmonids.

Anecdotal information dominates the literature concerning juniper removal and stream flow (Brown, 1987; Eddleman & Miller, 1992; Oregon State University, 1984). Landowners and extension personnel report increases in surface water, increases in water at springs, and decreases in surface water flow following juniper removal. Anecdotal results are reported from juniper cuts ranging from 5,000 acres out of a 40,000-acre watershed to 1,000 acres from a 20,000-acre watershed (Wood, et al., 1994). These anecdotal sites were not gauged either before or after this reported increase in water yield.

In order to understand how much water could be available to recharge streams, juniper water usage must be compared with the water usage of the vegetation that will replace it. In addition, the geography of the area including soil types and geologic parent materials need to be mapped, average rainfall must be calibrated for both the control and treated watershed, vegetation and percent cover need to be mapped, and pre and post-treatment stream flow at continuous gauging stations monitored (Baker, 1984; Collings & Myrick, 1966; Fisher & Buckhouse, 1998).

From a strictly water balance perspective, if the water is not being intercepted, evaporated, and transpired by juniper, then it has to go somewhere. Most of this water is used to decrease the soil moisture deficit. The percentage that travels to the streams via overland or below-ground flow depends on the soils and geology of the area (Eddleman & Miller, 1992; Hawkins, 1996; Miller, et al, 1987). When the soils are shallow and depth to bedrock is shallow or when hydraulic conductivities are slow (less than 1 mm/hr), excess moisture is available to the streams (Baker, 1984). It seems intuitive that if juniper use up to 50 liters of water per day, and vegetation with a much lower moisture demand replaces it, that the excess moisture would recharge the stream

system. Discovering to what degree that moisture contributes to measurable flow presents many challenges however. Water balance approaches do not account for cracks in bedrock and macropore flow that may result from juniper roots. Underground storage capacities are not easy to map and have not been considered in any of these studies.

Results from vegetation removal studies vary. When the trees are bulldozed, chained, or removed from the site, the water balance is not affected (Collings & Myrick, 1966). When dead trees are left standing, changes in stream flow are observed. Standing dead trees presumably influence microclimate by shading and reducing wind, decreasing moisture loss. When juniper stands have been replaced with grasses, the stream flow response has included increasing flow further into the year (Baker, 1984, Davis, 1984, Eddleman & Miller, 1992).

Water resource problems are not entirely attributable to juniper encroachment. Variations in precipitation play a major role. Further, removal of juniper cannot be expected to provide immediate returns in increased stream flow. Increases in stream flow could occur as late as 10 years after juniper removal.

**Juniper Benefits**

Juniper is a native species that plays an important role in the ecology of upland systems. Juniper is directly beneficial to some wildlife species, including big game animals that use the heavily wooded areas as refuge during the winter months. Wildlife diversity in moderate density juniper stands with healthy understories of shrubs, forbs, and bunchgrasses can be very high, but decreases as juniper stand closure occurs (Bedell, et al., 1993).

## 4. Mountain Mahogany / Bitterbrush Shrubland

Shrub habitats dominated by mountain mahogany and bitterbrush occur at scattered locations throughout the Conservation Area. Typical sites have shallow rocky soils, and range in topographic position from near the summits of rocky buttes, down steep or gradual slopes, into canyon bottoms. Other associated woody species include serviceberry and chokecherry in moister locations.

These shrub habitats do not occupy a large land area, and were not distinguished by the Landsat vegetation classification. They likely were included in the scattered juniper category.

Both mountain mahogany and bitterbrush are important browse species for deer and elk, and these shrubs provide habitat for birds and other wildlife.

## 5. Ponderosa Pine / Douglas-fir Forest

Ponderosa Pine / Douglas-fir Forest occurs at the higher elevations of the property on N. slopes. The only significant area of this conifer forest on the property is in upper Little Pine Canyon. Lesser amounts occur in the Old Mill Canyon drainage along a property boundary, and in upper Robinson Canyon. Limited amounts of Ponderosa Pine occur in association with juniper near the northern portion of Wagner Ranch's west boundary.

Scattered individual ponderosa pines occur at lower elevations in Robinson Canyon, presumably established from cones or seeds that washed down the canyon during high flows. Individual ponderosa pines also occur more widely on the property, including in minor Pine Creek tributaries, Rhodes Canyon tributaries, and in Jennies Peak Canyon.

The timbered area in Little Pine Canyon was recently harvested, with most large trees removed. A small stand of Douglas-fir, and individual pines, located below the mouth of Old Mill Canyon were not harvested, because Little Pine Canyon is too narrow to allow passage of mechanized equipment below this point. Some mature pines and firs were not harvested, and can serve as seed sources for regeneration. Seedlings and saplings are also well distributed. Slash piles are present throughout the logged area.

Juniper woodlands grade into ponderosa woodlands and ponderosa / Douglas-fir forest. There are few areas of open ponderosa woodland with well-developed grass understory.

### 6. Trembling Aspen

There are a few small stands and isolated individuals of trembling aspen on the property, at higher elevations. The largest patch of aspen occurs in Chichester Gulch, with additional patches in Robinson Canyon, Little Pine Canyon, and Old Mill Canyon. Most of these occur within riparian areas, but some patches in Old Mill and Little Pine Canyons are away from stream channels. These communities, like sagebrush steppe and bunchgrass areas, are subject to encroachment by western juniper.

## D. Management Considerations

The primary management concerns in upland habitats are juniper encroachment, fire management, and invasion of non-native annual grasses. Management of juniper, fire, and annual grasses are inextricably linked, and will be discussed together.

### 1. Juniper Management

Active management of western juniper is necessary to maintain the existing wildlife habitat values on the Conservation Area. Without active management, stand closure can be expected to increase in existing stands of juniper, resulting in the loss of understory shrubs and grasses, and juniper encroachment into current shrub steppe and grassland areas can be expected to continue. These changes would result in deterioration of upland habitats as well as detrimental changes to downstream riparian habitats for wildlife, and aquatic habitat for steelhead due to probable decreases in stream flow.

The scale of juniper encroachment into other habitats, combined with the topography of the Conservation Area, limits possible strategies for juniper control. Large areas of the Conservation Area are steep enough that vehicle access would be damaging to soil, vegetation, and watershed function, offsetting possible gains from juniper control. The lack of potential vehicle access limits mechanical control options. Herbicide approaches are also not feasible, due to likely

impacts to non-target species or water supplies, and prohibitive costs, of applications at large scales. These considerations leave fire as the primary management tool for control of juniper on the Conservation Area, with mechanical control in selected areas.

Wildfires and controlled burns each have the potential to play a major role in managing juniper on the Conservation Area. Many variables affect fire spread and intensity, including: humidity, wind speed, temperature, slope and aspect, time of day, available fuels and their structure, fuel moisture, soils, and amount of bare ground. The susceptibility of juniper to fire decreases with age, but also varies with fire intensity and the amount and type of fuel present.

**Wildfire Management**

Wildfires occurring within the last decade in the Clarno area, including the July 2000 Two Horse Fire which burned approximately 3000 acres of the Conservation Area, and the 2001 Wagner Mountain Fire, have resulted in high mortality of young junipers, with moderate to high mortality of older trees. Almost all small trees (under 6 feet tall) are killed in areas where sufficient fuel exists to carry a fire. Mortality of larger trees depends upon fire intensity and the presence of ladder fuels, such as sagebrush, which deliver fire into the tree crowns.

Wildfires have the potential to reduce the encroachment of western juniper into other habitats, while maintaining a mosaic of juniper woodlands within the landscape. Wildfires also can have negative ecological effects, primarily due to the altered landscape they now occur in. Severe wildfires can cause mortality among bunchgrasses and other native plants, favoring invasion by non-native annual grasses.

The Conservation Area is not a large enough area for a “let burn” policy to be a viable management strategy. Neighboring ranchers are concerned about the potential for wild fires to impact their fences, homes, livestock, and forage. Many of the ranchers also recognize the beneficial aspects of fire, but are unable to afford the costs of the potential damages from wildfires. Nevertheless, wildfires are inevitable in the area due to lightning strikes and / or accidental ignitions.

The Tribes will develop a wildfire response plan, in cooperation with the Bureau of Land Management, which will acknowledge the beneficial role of fire, the potential ecological and economic impacts of fire, and the potential ecological impacts of fire-fighting activities. This wildfire plan should utilize pre-designated firebreaks, and allow fires to burn that are not threatening structures or neighboring private lands. This wildfire response plan must also emphasize the importance of communicating with neighboring landowners.

**Prescribed Fire**

Prescribed burning is an option for juniper control. Fire as a management tool will be beneficial for many areas of the Conservation Area – especially in areas with young juniper, sagebrush and native grass.

The Prineville District BLM conducted a prescribed fire on Sutton Mountain in September, 2001, and preliminary results suggest the burn was effective for juniper control and habitat improvement. The goal was approximately 50% burn of a 20,000-acre area, and was met with burning approximately 11,000 acres.

Juniper control will be most effective in areas with sufficient understory vegetation to carry a flame into juniper canopies. Some of the juniper does not have sufficient understory to carry a burn (those areas with juniper and bare soil between the trees). However, these areas can be used as fire barriers in a prescribed burn. To carry a burn, 500 to 700 pounds of fine fuels per acre are needed. Selecting burn sites on steep slopes, with adequate ladder fuels present, may allow fire to kill large trees even if conducted outside of the primary wildfire season.

In some years, winter controlled fires can be successful in juniper control. A fire can be started after several dry, cold February days (10-20 °C or below) to "freeze-dry" the trees. A fire under these conditions does not result in a total kill of juniper on the burn site, but can be effective against younger trees, and may create some patches that allow sagebrush to move in. If enough sagebrush establishes over the following 10 years, then the fire could be repeated with the sagebrush contributing fuel to increase the effectiveness of the burn.

The pre-fire vegetation will need to be carefully inventoried to determine what plants will respond following the burn. Prescribed burning should be used only where sufficient cover of fire-tolerant grasses and forbs are present or where post-fire seeding is practical. If seeding is not an option, fire should be used only in those areas with at least 20 percent desirable species and at least one bunchgrass plant per square yard ($m^2$) (Young, 1983).

Burn sites should be selected that do not have dense infestations of medusahead and cheatgrass, as these annual grasses typically respond well to fire. Spring burns can be used to reduce seed-set of annual grasses, but often do not carry well. Soils with high clay content need to be seeded following fire to prevent medusahead from invading. A seed source for medusahead is available throughout the Conservation Area and would likely invade the burned areas. Caution is advised when burning in areas with significant amounts of bitterbrush because of its susceptibility to fire, which varies with the age and size of the plant. It is an important winter range food source for deer (Young, 1983).

Depending upon fire intensity and pre-fire vegetation health, re-seeding of native grasses may be necessary after fires. The Tribes should work with BLM and TNC to develop sources of native seed mixes for planting after prescribed burns or wildfires in the John Day Basin.

Fire prescriptions will need to be written for each area under consideration for burning. The Prineville District BLM could assist with developing fire prescriptions. In order to use controlled burns, careful coordination and communication with neighboring landowners is critical. Several of the neighboring landowners have concerns about wildfire and would likely have these same concerns about prescribed fires. Efforts will need to be made to educate the adjacent landowners on the benefits of fire when it is chosen as a management technique.

**Mechanical Control**

As noted above, mechanical control options are limited on the Conservation Area due to steep topography and concerns about impacts of motor vehicles or other mechanized equipment.

Limited harvest of juniper trees may be an option on the property, especially in productive sites in valley bottoms with tall, straight-trunked trees. At this time, juniper harvest is not an economic proposition, but the value of the timber could help offset the costs of removal. This strategy would be considered only if the impacts of the harvest operation are minimized.

No commercial timber harvest is permitted on the property, with the possible exception of juniper harvest to help offset the cost of juniper control projects, as discussed above.

Chainsaw felling can be used to directly kill juniper. Large felled junipers burn at very high intensity in subsequent wildfires or controlled burns, leading to mortality of bunchgrasses and supporting invasion of annual grasses. Ideally, large felled junipers should have all limbs lopped and scattered, and boles removed. Boles could be used for firewood or donated to community service organizations. Scattered limbs provide shade to the soil, may decrease moisture loss, and provide fine fuels that will increase future fire spread. Felling, lopping, and scattering is an extremely labor-intensive process, and using equipment to remove boles can lead to soil compaction.

In order to increase efficiency, more closely mimic the results of fire, and gain the hydrologic and wildlife benefits of leaving standing dead trees, chainsaw girdling could be used on larger trees. Girdling must cut deep enough to completely sever the cambium, which is often deep within folds in the trunk. Juniper is often capable of surviving girdling, although multiple deep cuts may prove effective. Trees under ten feet tall could be readily felled and scattered.

Mechanical control should leave old growth trees and snags intact for their wildlife habitat value. Mechanical control, like controlled burning, should be focused on areas that have remaining native vegetation in the understory that will be capable of revegetating the site.

For hydrologic benefit, juniper in obvious areas of groundwater presence could be targeted for girdling or felling (areas such as floodplains, drainage ways, and first order streams high in the watershed). Trees with leaders on the tops and side branches would need to be selected, as leaders indicate high water use.

**Juniper Control Monitoring**

Basic monitoring of juniper control efforts should include before and after photos, comparisons of stand density, and mortality estimates by size or age classes. Detailed studies could also be planned to include several years of pre-control soil moisture measurements. Soil moisture analysis will show a measurable increase or decrease after a few years (1 to 3) versus flow measurements in the creek which may take over 10 years to show any differences. Streamflow gaging on Pine Creek may also demonstrate long-term improvements in watershed function, but

it will be difficult to determine the contributions of multiple watershed improvements (juniper control, upland vegetation recovery, riparian recovery) to increases in flow. Careful data collection will assist other land managers in the basin in making juniper control decisions.

## 2. Annual Grasses

Cheatgrass and medusahead are the primary non-native annual grasses of concern on the Conservation Area. Both have the potential to be highly invasive in bunchgrass and sagebrush habitats. As annuals, the key to control efforts is reducing seed-set. Seeds can be viable in the soil for a few years, and control efforts therefore need to be repeated for several years. Soil disturbance also increases the spread of these species, and minimizing soil disturbance should be a basic component of the management strategy. Any control strategy must be paired with restoration of native species to avoid reinfestation of annuals.

### Mechanical Control

Targeted mowing can prevent seed-set, but often must be repeated several times annually to be effective. On a small scale, mowing with a handheld weed-whacker has provided a means of avoiding impacts to desirable species. Hand-pulling is also possible at small scales. No mechanical control techniques are currently feasible at large spatial scales.

### Chemical Control

Herbicide approaches to date have either involved spot-spraying targeted at the annual grasses, careful timing and use of chemical concentrations low enough to reduce mortality among desirable natives, or complete kills in areas where little native vegetation remained. Spot-spraying is not feasible at large spatial scales, and large scale herbicide applications on the Conservation Area are not desirable due to the presence of culturally significant plant foods and other native species located among the areas of annual grass infestations. However, some of the controlled application rate tests using sulfometuron, glyphosate, or Ammonium salt of imazapic have shown low impacts to native perennials with successful control of annuals. This research will be monitored, and experimental trials may be conducted on the Conservation Area. Chemical control may be most feasible in historic agricultural fields with little or no native vegetation.

### Restoration

Restoration of native bunchgrasses and other species to annual grass infested sites is a developing field. Most seeding efforts have had relatively low success. Restoration efforts have typically relied on several years of annual grass control prior to plantings. The Nature Conservancy has successfully planted plugs of bunchgrasses, nursery-raised from native seed, at Lawrence Memorial Grasslands Preserve near Shaniko, Oregon. This approach is extremely labor-intensive, and would be difficult to apply at large scales. Other range-restoration projects have used non-native perennials to compete with cheatgrass and medusahead. Bottlebrush squirreltail and sand dropseed are native grass species that have shown some promise in their ability to compete with annual grasses.

**Fire avoidance**

Avoiding hot wildfires can help reduce the spread of invasive annual grasses. The use of "greenstrips" is one means of isolating annual grasses from wildfire. Greenstrips can be created by burning prior to wildfire season, or by planting with a non-native species such as crested wheatgrass that carries fire more poorly than native bunchgrasses.

**Summary**

Control of annual grasses and restoration of native species is an emerging field. Millions of acres of rangeland in the western U.S. are infested with cheatgrass and medusahead, yet reliable restoration techniques remain largely unproven. Efforts are also underway to develop biological control organisms for cheatgrass and medusahead. The Tribes will monitor this research, and will implement experimental-scale restoration projects prior to any large-scale upland restoration attempts.

# VIII. RIPARIAN HABITAT AREAS

## A. Description of Historic Natural Conditions

Very little information is available about the natural conditions of riparian areas on the current Conservation Area property prior to European settlement. General conditions on the John Day River have been described as heavy riparian cover along stream banks, including aspen and willow, with wide cottonwood galleries (Knapp, et al., 1001; Wissmar et al. 1994).

Historic accounts from some of the earliest homesteaders in the Clarno area describe a "virtual forest of large willow" near the John Day River at Clarno (Campbell, 1977). A turn of the century account from Albert Lyle (available at the Fossil Museum) described obtaining firewood as "somewhat of a problem" in the Cove Creek – lower Pine Creek area. Fuel wood was hauled from upper Pine Creek, which was, then as now, forested with ponderosa pine, and also from "the Juniper areas of the surrounding countryside". Very few early photographs of the area are available, and most do not show riparian conditions. Photos from Clarno in 1899 (Oregon Historical Society collections) depict low deciduous trees in the background, probably willows, or possibly hackberry. The only large trees depicted in any early photographs are Lombardy Poplars planted by homesteaders.

More recent historical data can also provide information on the trend of riparian areas after the homestead era. Accounts of area residents describe degradation of riparian vegetation on Pine Creek within recent decades.

General information about natural riparian conditions can be inferred from soil types, topography, and remnant native vegetation. Current and historical use of the creek by spawning steelhead provides evidence that natural riparian conditions were suitable for steelhead habitat.

Based upon inferences from these sources, and opinions from watershed and range experts, the following rough outline of presumed historic, natural riparian conditions is offered:

### 1. John Day River Mainstem

The portions of the lower John Day abutting Pine Creek Conservation Area vary considerably in the geomorphology of the valley bottom: ranging from broad floodplains to narrow canyon segments constricted by rock outcrops. Areas with broad floodplains presumably supported more diverse riparian vegetation than narrow canyon areas. Cottonwoods were likely present, along with willow and diverse shrub and herbaceous communities. Floodplains may have been dominated by basin wildrye and big sagebrush.

### 2. Pine Creek Mainstem

Pine Creek is a perennially flowing stream, with a sinuous channel through broad floodplains, constrained locally by narrower canyon segments. Diverse woody and herbaceous vegetation in

the riparian area probably included scattered cottonwoods. Beaver ponds occurred along the creek. Floodplains dominated by basin wildrye and basin big sagebrush were subject to periodic flooding, in some areas, wet meadows were likely sub-irrigated.

### 3. Pine Creek Tributaries

Tributaries of Pine Creek varied widely in their natural condition. Major drainages such as Lone Pine Creek, Little Pine Canyon, Robinson Canyon, and Cove Creek likely had perennial stream flow. Spring sources in minor and major tributaries, would have had willows and other deciduous riparian vegetation, probably including scattered cottonwoods. Old cottonwoods still occur in Robinson Canyon.

### 4. John Day Tributaries: Rhodes, Rattlesnake, Amine, & Rock Canyons

All of the remaining John Day tributaries within the Conservation Area have much smaller watersheds than Pine Creek (Table 1).

Rhodes Canyon flows primarily SSW toward the John Day River, and a large portion of the watershed is composed of south-facing slopes. The upper portions of the watershed lie primarily within Pine Creek Conservation Area (7,285 acres plus approximately 680 acres of BLM land within Conservation Area boundaries). Below the Conservation Area, Rhodes Canyon flows through BLM land for over one mile, and then through small parcels of private and state land for less than ½ mile before joining the John Day River.

Rhodes, Rattlesnake, and Amine Canyons drain a combined area of 19,116 acres, and all three reach the John Day river within ¼ mile of one another. Rattlesnake and Amine Canyons drain the northern portion of Wagner Ranch.

Upper portions of these drainages were likely similar in condition to tributaries of Pine Creek, with scattered spring sources providing perennial water. Seasonal flow in the lower portions of these canyons likely was more prolonged and less "flashy" than under current conditions, and perennial or near-perennial flow may have occurred to near the mouth of each canyon.

## B. Historic Impacts

Historic impacts to riparian areas fall into two categories: 1) direct impacts within the riparian area, and 2) impacts from management activities within the watersheds upstream of riparian areas. Impacts to upland habitats have been summarized in Section VII. B.

The impacts to riparian areas from early intensive grazing and agricultural use were severe. Soil compaction and reduction of plant biomass from upland grazing increased run-off and erosive potential of streams. The invasion of bunchgrass habitats by annual grasses such as cheatgrass and medusahead, combined with juniper encroachment, increased the "flashiness" of watersheds, with the consequence of greater erosion during high flow events. Subsequent changes in grazing management reduced ongoing impacts, but recovery has been incomplete.

Agricultural activities and settlement were concentrated in productive floodplains, irrigated with water diverted from the river and creek. Plowing floodplains into agricultural fields caused direct losses of native plant communities, and increased erosion. The invasion of noxious weeds has further displaced native vegetation in riparian areas and floodplains. Grazing within riparian areas further accelerated erosion through direct impacts to riparian vegetation.

Beaver were trapped for their pelts, to the point of near extirpation from many areas. The temporary loss of beaver dams exacerbated the increased erosion from other impacts, leading to incision by stream channels, and loss of access to historic floodplains.

The construction of a carriage road, and eventually a paved highway, through Pine Creek's canyon also constrained the creek in areas where the canyon was narrow.

These practices also occurred throughout the John Day River watershed. Additional impacts to the hydrology of the river came from mining and timber harvesting in the upper watershed. A significant net effect of these changes has been a shift in the hydrology of the basin from a relatively stable flow throughout the summer to increased peak flows and decreased summer flows (Knapp, et al., 2001). Flooding during high peak flows increased the erosive power of the river in its lower reaches, increasing impacts to areas with riparian habitats damaged by local activities.

## C. Assessment of Current Conditions

### 1. John Day River Mainstem

Current conditions on the mainstem John Day River within the Conservation Area vary greatly. The Wagner Ranch portion of the property includes two primary agricultural fields on floodplains, several other low terrace areas, and a large portion of steep riverbank grading directly into upland slopes or rock outcrops. A few islands occur along this section of the river, ranging from a high terrace with a few ponderosa pines to low gravel bars.

The agricultural fields on the Wagner parcel have been fallow for at least several years, since acquisition by the prior owner in 1998. They are not entirely flat fields, and include several lower swales or flood channels that increase the potential habitat diversity. Weedy annual grasses and noxious weeds currently dominate the fields. Scattered patches of native basin wild rye and other perennial grasses remain.

Unplowed terrace areas along the John Day are in better condition, with native bunchgrasses, sagebrush, and juniper present, although annual grasses and weeds also occur in these areas.

Riparian vegetation shows minimal development along the Wagner Ranch portion of the John Day, with only occasional patches of willow, and relatively sparse communities of native sedges and rushes. Reed canary grass, along with sedges, commonly forms a narrow strip of riparian vegetation along the bank.

The John Day River riparian area at the mouth of Pine Creek is fairly well developed. The river has a broad historic floodplain here, with active farm fields on the West bank, and a historic farm field on the Conservation Area property on each side of the creek. From the property boundary downstream to the mouth of Pine Creek, the riparian area is narrow (2-10 meters), and dominated by coyote willow (Salix exigua). Downstream of the creek mouth, the riparian area is considerably broader (up to 30 m), and includes flood channels through a dense willow community.

## 2. Pine Creek Mainstem

Several assessments provide information on current conditions on Pine Creek. Oregon DEQ collected water quality data from 1990 to 1992, and again in 2001; the National Riparian Service Team completed a Proper Functioning Condition Assessment in April, 2001; and Duckfoot Survey Company conducted riparian vegetation monitoring in July 2001.

DEQ collected water chemistry, stream habitat, and macroinvertebrate community data on Pine Creek between 1990 and 1992 as part of an evaluation of an EPA Rapid Bioassessment Benthic Protocol (Caton, 1993). This Assessment found Pine Creek in "very poor condition" despite several OWEB projects to improve conditions. Habitat assessments at seven locations ranked all sites as "poor" and macroinvertebrate communities were ranked as severely impaired at 5 of 7 sites (These rankings of impairment were relative to a higher elevation, spring-fed stream). Pine Creek is on the Oregon DEQ 303(d) list for violating the water quality standard for biotic criteria in 1990-91. Segments of Pine Creek lacked surface flow, at the time attributed to drought conditions. A similar lack of surface flow in two segments is currently observed on the creek (August 2001 to April 2001). DEQ repeated water quality monitoring at 6 of the original 7 sites (excepting one site upstream of Pine Creek Conservation Area) in 2001.

A Proper Functioning Condition Assessment (Prichard, 1998) was performed with the National Riparian Service Team April 3-5, 2001. PFC assessment is a methodology for determining the physical functioning of riparian and wetland areas through consideration of hydrology, vegetation, and soil/landform attributes (Prichard, 1998). The on-the-ground condition termed "PFC" refers to a state of resiliency that will allow a riparian-wetland system to hold together during a 25 to 30 year flow event, sustaining that system's ability to provide physical and biological values. PFC is not equivalent to the desired future condition of the creek, nor is it the historic condition of the creek.

The NRST noted that Pine Creek's channel had been altered and/or moved in many locations due to agricultural use of valley bottom fields, as well as uncontrolled cattle grazing in the riparian zone. The creek is currently showing initial signs of recovery after cattle exclusion. Release of woody vegetation has occurred, and streambank colonizing species are numerous. Adequate diversity of riparian vegetation exists, but channel conditions and extent of riparian vegetation along most of the creek are currently inadequate to withstand moderate flow events. Recovery is expected to be a prolonged process dependent upon year-to-year climatic variation. High flow events are expected to cause apparent degradation but contribute to development of appropriate channel characteristics. The currently incised channel needs to continue development of

floodplains and meanders that dissipate energy during high flows.

Fourteen reaches were assessed. With the exception of a 0.2 mile reach of well-developed wetlands that was assessed as in PFC, all reaches of the creek were rated as "Functional-At Risk," a category encompassing all conditions between Nonfunctional and PFC. More detailed information on each reach was noted as comments on the PFC checklist and has been integrated into a monitoring database for the Conservation Area.

Duckfoot Survey Company conducted riparian vegetation monitoring on 30 transects across Pine Creek, 5 at each of the six DEQ study points within the Conservation Area. Dominant vegetation species were recorded in each canopy layer (tree, shrub, graminoid/forb) along transects running across the valley bottom. Streamside woody and herbaceous vegetation were measured in 10 m plots extending downstream from each transect.

Wet site vegetation was found to be restricted to a narrow band along the creek, averaging between 3 and 5 m in width. As a result of past channel incision and agricultural practices, terraces are dominated by weedy dry site vegetation. Streamside vegetation was noted to generally be in good condition, while recovery of terraces will depend upon channel aggradation, which should occur gradually with continued exclusion of livestock grazing.

The historic floodplains of Pine Creek are some of the most highly altered areas on the property. Their condition varies depending on the local impacts of activities such as agriculture, heavy grazing, and highway construction. These activities and upland watershed changes altered the hydrology of the creek, creating incised channels.

The floodplains have a high component of introduced vegetation, including cheatgrass, pasture grasses, yellow star-thistle, knapweeds, and Scotch thistle. Some areas are currently dominated by big sagebrush, and there are residual patches of native basin wild rye.

The historic floodplains are marginally functional as riparian buffers in their current condition. The most functional areas are those dominated by big sagebrush and basin wild rye. The other areas are generally densely vegetated, but often with annual grasses or noxious weeds with poor soil-holding and water-infiltrating properties.

The floodplains are providing wildlife habitats of low to moderate quality in their current condition. They are important winter range for mule deer and elk. They provide habitat for small mammals, grassland birds, and raptors. These habitat attributes could be greatly improved by restoration of native plant communities.

## 3. Pine Creek Tributaries

Tributaries to Pine Creek vary in their natural condition, the impacts they have experienced, and their current condition. No formal assessment of conditions of tributary riparian areas has been conducted. This section first describes general conditions in Pine Creek tributary riparian areas, then focuses on individual major tributaries. The majority of minor tributaries have conditions similar to those described below.

**Conditions of Note**

1. The majority of tributaries currently have channels that are incised where they pass through non-resistant material.

2. The best conditions in riparian habitats in tributaries are found where resistant bedrock has prevented incision.

3. Most tributaries have one to several spring sources, some of which provide a year-round source of water. In most cases, these spring sources have experienced heavy impacts from livestock, and in many cases, have been dammed to create stock ponds or piped into stock watering tanks. The majority of the stock tanks are no longer functioning. Infestations of noxious weeds or other non-native plant species are common at stock-watering sites.

4. All Pine Creek tributaries have only seasonal or ephemeral surface flow near their confluence with Pine Creek.

5. Noxious weeds currently are not abundant in tributary drainages. Most tributaries have at least remnant native riparian vegetation, often as little as a single willow near a spring in smaller drainages. Some tributaries, including some of the smaller drainages, have dense stands of old willows and other riparian shrubs.

6. Several tributary drainages have been used for road construction. Conservation Area roads in riparian areas are likely contributing sediments to the Pine Creek system, and have served as corridors for noxious weed dispersal. These roads are not designed to withstand high flow events in tributary channels, and are likely to wash out during flood events.

7. The majority of Pine Creek tributaries do not currently provide fish spawning and rearing habitat, and are not known to have historically provided fish habitat. The exceptions are Robinson Canyon and its tributary Little Pine Canyon (known current and historic habitat), Lone Pine Creek (possible current and historic habitat), and Cove Creek (possible historic habitat).

8. Riparian areas of tributary drainages have high importance as wildlife habitat, primarily due to water availability. Springs in tributary drainages provide water sources that increase habitat suitability of upland areas for wide-ranging species, and provide local habitat for amphibians, reptiles, birds, and small mammals.

**Major Pine Creek Tributaries**

*1. Lone Pine Creek*

Lone Pine Creek is a 2,191-acre drainage tributary to Pine Creek near the point where it enters Pine Creek Conservation Area. Highway 218 follows the North side of Lone Pine Creek from Pine Creek to the top of Chichester Pass toward Fossil. Pine Creek Conservation Area includes 1,133 acres, plus 40 BLM acres, in the Lone Pine drainage, but the creek itself lies within adjacent private property, currently used for livestock grazing. Lone Pine Creek has near-perennial flow to its confluence with Pine Creek, extensive riparian vegetation, and active beaver dams.

Chichester Gulch is the major northern tributary of Lone Pine Creek, and lies within Pine Creek Conservation Area (other than its upper extremity, which lies within private ranch land). Chichester Gulch has perennial flow, and riparian vegetation including aspen, willow, bitter cherry, other shrubs, and sedges.

*2. Robinson Canyon*

Robinson Canyon is the largest southern tributary of Pine Creek, with a drainage area of 6,025 acres. Pine Creek Conservation Area includes 3,221 acres in the Robinson Canyon drainage, plus 179 acres of BLM land. The upper portions of eastern tributaries to Robinson Canyon are on private land used for livestock grazing.

The lower ½ mile of Robinson Canyon currently has only seasonal surface flow. This segment has experienced heavy deposition of gravel in a broad floodplain, and lacks surface flow for much of the year. A ranch road runs along this section of the creek, within the floodplain.

There is a headcut in this segment, where the stream re-entered the channel after flowing on the road surface. The channel has moved slightly to the west, away from a bedrock outcrop it previously flowed across. Approximately ½ mile up Robinson Canyon is a homestead site with old Lombardy poplars, orchard trees, and native cottonwoods. This site is a unique wildlife habitat on the property.

From the poplars upstream to Little Pine Canyon, Robinson has seasonal surface flow, with occasional pools that maintained water throughout the summer and fall in 2000 and 2001. This section had continuous or nearly-continuous surface flow beginning in early winter 2000-2001. Riparian vegetation is limited, with occasional patches of willows and other shrubs, scattered wild rose, and several individual large cottonwoods. Western juniper is dense in lower Robinson Canyon, often growing in the stream channel and on the banks and floodplain. Occasional ponderosa pines (primarily saplings) occur in or next to the stream channel in this section, likely germinated from seeds or cones washed down from upstream. The channel is composed primarily of gravel and cobbles, with occasional sections of exposed bedrock. An old ranch road (now used as a foot trail) is adjacent to the creek, and crosses the creek several times in this section. Robinson Canyon is known to have historically been steelhead spawning habitat, and pools in this section of the canyon held juvenile steelhead or resident rainbow trout in 2000. This relatively low-elevation section of Robinson Canyon is also important for wildlife habitat, with available water, occasional large cottonwoods, and juniper woodlands.

Robinson Canyon above Little Pine Canyon is generally similar to the lower section, but is of higher gradient, with more exposure of bedrock in the channel, and a narrower valley with little floodplain. Surface flow was perennial in 2000. Riparian vegetation is present only in clumps, with many areas of bare gravel or rock. Cottonwood is absent from this section. A few aspen are present high in this section. The Conservation Area road continues to cross the riparian area, and in places it runs directly down the channel. No steelhead or trout were observed in this section in 2000, although it likely provided historic spawning and rearing habitat.

The uppermost portion of Robinson Canyon lies within a broader valley. There is a deep incised channel, with old willows in clumps rooted within the channel. A stock pond lies just below an old homestead site (Brinkley). This pond was dry in late summer to fall of 2000 and 2001, but full in winter and spring. Above the Brinkley site, riparian vegetation includes occasional willows, among thick juniper woodland with scattered ponderosa pine. The ranch road is to the west of the stream channel below the Brinkley site, and there is no road within the canyon above.

*3. Little Pine Canyon*

Little Pine Canyon flows into Robinson Canyon from the east approximately 2 miles upstream from Pine Creek. Little Pine Canyon is a 3,111-acre drainage within Robinson Canyon's 6025 acres. Pine Creek Conservation Area includes 1,360 acres within the Little Pine Canyon drainage.

The lower 1/3 mile of Little Pine Canyon has a gravel and cobble channel that lacked surface flow from August 2000 through January 2001, with the exception of an occasional short segment. Little riparian vegetation is present, primarily an occasional wild rose. The canyon bottom is dense juniper woodland with an occasional ponderosa pine sapling.

The next section of Little Pine Canyon, from 1/3 mile above Robinson Canyon to the confluence of Old Mill Canyon, a large eastern tributary, is in relatively good condition. (Old Mill Canyon and another eastern tributary of Little Pine Canyon lie primarily outside of Pine Creek Conservation Area.) The channel is primarily cobbles and gravel, with occasional bedrock exposure. The canyon is extremely narrow, with steep sides. Mountain mahogany is abundant on the canyon slopes and near the creek. Riparian shrubs are present, including occasional willow, syringa, and chokecherry. Proceeding upstream, ponderosa pine becomes increasingly common, and Douglas-fir occurs next to the stream and on a small bench above the stream on the south bank near Old Mill Canyon.

From Old Mill Canyon upstream, Ponderosa pine timber was recently logged from Little Pine Canyon. The canyon bottom was used as the logging road, which was frequently directly in the stream channel. The channel is now recently incised within the logging road, or has been constrained by placing the logging road adjacent to the channel. The substrate is primarily gravel with occasional bedrock in the lowermost section, which is currently in the earliest stages of revegetation, with only herbaceous vegetation present. Upstream, deeper soil is present, and occasional willows and a few clumps of aspen remain where the valley was wide enough to allow placement of the road outside of the riparian channel. Ponderosa pine seedlings, saplings, and occasional larger trees are present, within a matrix of juniper.

*4. Cove Creek*

Cove Creek is the largest tributary of Pine Creek, with an 8,541-acre drainage area. The majority of this drainage lies outside of Pine Creek Conservation Area, which includes only 1,545 acres plus an additional approximately 320 acres of BLM land within the boundaries. Steelhead or trout do not currently utilize Cove Creek, though it has been described as historical spawning habitat. The Cove Creek drainage lies at low elevations and is primarily south-facing, resulting in warmer and drier conditions than other smaller tributaries of Pine Creek.

South of Highway 218, Cove Creek enters a broad portion of Pine Creek's floodplain, and parallels Pine Creek through the floodplain for approximately ½ mile before joining. This section of channel is deeply incised in deep floodplain soils, and lacked surface flow from August 2000 through February 2001. Little riparian vegetation is present, with knapweed, cheatgrass, and pasture grasses from the floodplain extending down into the channel.

From Highway 218 upstream to the north, for approximately 1 mile, Cove Creek lies in a moderately incised channel, flowing through a broad valley bottom dominated by sagebrush with low-density juniper. The channel substrate is a mix of cobbles and fine sediments. This section of stream also is intermittent or seasonal, lacking surface flow from August 2000 until February 2001. Occasional willows are present, but riparian vegetation is generally lacking. A ranch road parallels the creek channel on the east side. This road was one of the first in the area, a spur that led to Fossil from the Dalles- Canyon City Military Road.

Approximately 1 mile upstream of the highway, a homestead site lies on the east side of the creek, with a group of large Lombardy poplars and a spring that is piped into a stock-watering trough. This spring has perennial flow, and a stock pond below the trough is densely vegetated with cattails, sedges, and grasses. Surface flow from this spring continues across the ranch road and into the Cove Creek channel. From this point upstream for approximately ½ mile, Cove Creek also has seasonal surface flow, and a dense stand of willows occupies the creek channel. From the Widow Hildebrand site, the primary ranch road leaves Cove Creek, but a side road crosses the creek and continues upstream on the west side.

From approximately 1½ miles above the highway, the main channel of Cove Creek lacks perennial surface flow. Cove Creek has numerous unnamed tributaries, most of which lie outside of Pine Creek Conservation Area. A large tributary that joins from the east approximately two miles upstream from the highway has two main forks, each of which are largely in Pine Creek Conservation Area property. Both of these forks have spring sources and areas of healthy riparian vegetation. The other tributaries also have spring sources outside of Pine Creek Conservation Area.

## 4. John Day Tributaries: Rhodes, Rattlesnake, Amine, & Rock Canyons

The lower portions of all of these canyons currently lack perennial surface flow. Lower Rhodes Canyon shows evidence of major historic flooding, with substantial deposition of gravel and

cobbles. Rattlesnake Canyon has substantial spring sources in its upper reaches, as well as a narrow rocky section with perennial surface flow, and has intermittent surface flow into the John Day River. Rhodes, Amine, and Rock Canyons also have spring sources in their upper portions.

Upper sections of these drainages are broadly similar to smaller tributaries of Pine Creek. Most channels are incised where they pass through non-resistant material, and the best riparian habitat conditions are found where bedrock has prevented incision. Many have perennial flow from spring sources, many of which have been dammed to create stock ponds or piped into watering troughs.

Most upper segments have at least remnant native riparian vegetation, often as little as a single willow near a spring in smaller drainages. Some have dense stands of willows and other riparian shrubs. Noxious weeds are not widespread in these watersheds, although they occur along some ranch roads.

Steelhead or trout do not currently utilize any of these tributaries (to the best knowledge of the habitat manager) and they are not known to have historically utilized these drainages.

Riparian areas of these canyons are important wildlife habitat, primarily due to water availability. Springs in tributary drainages provide water sources that increase habitat suitability of upland areas for wide-ranging species, and provide local habitat for amphibians, reptiles, birds, and small mammals.

**1. Rhodes Canyon**

Rhodes Canyon through its lower 3 ½ to 4 miles is an ephemeral stream, generally lacking surface flow. The stream channel is composed almost entirely of cobbles and gravel through this lower section. The floodplain of the creek is a broad area of deposition of coarse gravels and cobbles, suggesting a tendency toward episodic high flow events. Very little riparian vegetation is present in this lower section of Rhodes Canyon. A ranch road lies within the floodplain of the creek, and often within the creek bed itself. This road is subject to washing out in high flow events.

Sluice Canyon is a major eastern tributary of Rhodes Canyon, joining inside Pine Creek Conservation Area near the property boundary. The lower portion of Sluice Canyon is very similar to Rhodes Canyon, composed of a broad depositional area for coarse gravels and cobbles.

Several ranch roads lie in the Rhodes Canyon watershed, all of which pass through riparian areas. The Rhodes Canyon road has two branches, with one branch staying in Rhodes Canyon until near the top of the drainage before joining the Jennies Peak Road. The second branch goes up a tributary to the north before leaving the watershed. The Jennies Peak Road enters the Rhodes Canyon drainage from lower Robinson Canyon, and passes through or crosses several headwater channels before returning to Robinson Canyon's watershed near the Brinkley site. These three roads may all be necessary to maintain for management purposes. None of these roads are engineered to withstand flooding events.

**2. Rattlesnake Canyon**

Rattlesnake Canyon probably has greater seasonal flow than Rhodes, Amine, or Rock Canyons. It has surface flow into the John Day River during the spring. A ranch road follows this canyon from the John Day upstream to near the head of the canyon, crossing the stream channel multiple times. It may prove necessary to maintain this road for management purposes.

The upper portion of Rattlesnake Canyon includes a narrow rocky canyon, with perennial surface flow and riparian vegetation including sedges, rushes, and shrubs. Above this segment are several spring sources, including one that has been dammed to create two ponds that currently support a dense growth of sedges and reeds.

**3. Amine Canyon and Rock Canyon**

Amine and Rock Canyons are relatively free of road developments compared to other major drainages on the property. A ranch road crosses Amine Canyon approximately 2 miles above the John Day River, and follows the Canyon bottom for approximately ¾ mile before climbing a slope. This same road crosses Rock Canyon near its upper end, about 2.5 miles above the John Day River, but no roads follow Rock Canyon.

## D. Management Considerations

Ecological restoration of riparian zones requires a holistic approach whereby activities and conditions across an entire watershed should be considered. Problems affecting riparian and aquatic resources are unlikely to be solved by ignoring deleterious land management practices, either historical or current, that occur at landscape or watershed scales. Management actions taken throughout the relevant watersheds are expected to affect the riparian zones on the Conservation Area.

Over 2/3 of the John Day River's 8100 square mile watershed lies upstream of Pine Creek Conservation Area. Recovery of riparian habitats along the John Day within Pine Creek Conservation Area is clearly dependent upon management actions in the upper watershed of the river as well as local practices. Observation of other riparian habitat improvement projects on the lower John Day suggests that substantial recovery can occur as a result of limiting or excluding livestock grazing.

Pine Creek Conservation Area includes only 37% of the 41,701 acre Pine Creek watershed. The predominant activity in the remainder of the watershed is cattle grazing, with timber harvesting a possible factor in the upper watershed. While potential impacts from outside of the Conservation Area property are significant, the scale and arrangement of the Conservation Area suggests a great deal of recovery may occur.

Restoration of degraded riparian zones and their subsequent conservation after recovery requires knowledge of how these systems function as well as the attributes responsible for their composition, structure and productivity. Three features that must be understood include 1. soils, geomorphology; 2. hydrology; and 3. biota. The soils/geomorphology features include

streambank and floodplain form and development, channel gradient, geologic substrates influencing soil and channel composition, and subsoil features of the floodplain (e.g., gravel lenses important for subsurface flows). Hydrologic features include the frequency, magnitude and temporal distribution of stream flow (including peak and low flows), sediment availability and transport, subsurface hydrology, and water quality. Biotic features include vegetation, vertebrates, invertebrates, and microorganisms.

The first and most critical step is the halt of activities causing the degradation or preventing recovery and allowing the system to recover on its own. Livestock grazing has been the most prevalent cause of ecological degradation for many riparian and stream ecosystems. After Beschta and Kauffman field reviewed fish habitat improvement projects in eastern Oregon, they found that the cessation of livestock grazing in riparian zones was the single most ecologically effective approach to restoring salmonid habitats. The Tribes removed livestock from the Conservation Area upon purchase of the property.

In reviews of eastern Oregon projects and throughout the western U.S., passive restoration has been the first critical step, and often the only step needed for recovery of riparian systems (Beschta, et al. 1991, Kauffman et al. 1993; Beschta et al. 1994).

Beaver are widespread in Pine Creek, and can be expected to play a major role in restoring the hydrology of the creek. Willow and other native riparian shrubs are currently widespread, and will likely expand their range as appropriate soils and hydrology return (e.g., narrowing and deepening of the channel). Other than improving vegetation in abandoned farm fields, monitoring of natural recovery of Pine Creek's riparian area is recommended over active restoration techniques. Active restoration practices will be considered if monitoring data provide evidence that such a strategy is appropriate.

Recovery of riparian habitats in tributary drainages is most likely to depend upon successful management of upland areas, especially as related to vegetation changes that will promote healthy watershed function.

# IX. LISTED SPECIES

No Endangered Species are currently known or expected to occur on the Conservation Area, however, several Threatened species and numerous Species of Concern or Sensitive species are known or expected to occur (Table 4).

**Table 4. Species listed as Endangered, Threatened, Candidate, Species of Concern, or Sensitive.**

| Species | Scientific Name | US | | | OR | | Observed | | Expected |
|---|---|---|---|---|---|---|---|---|---|
| | | T | C | SC | T | S | 00-03 | Prior | |
| **MAMMALS** | | | | | | | | | |
| Pygmy rabbit | *Brachylagus idahoensis* | | | √ | | √ | | | √ |
| White-tailed jackrabbit | *Lepus townsendii* | | | | | √ | | √ | |
| Pale western big-eared bat | *Corynorhinus townsendii pallescens* | | | √ | | √ | √ | | |
| Spotted bat | *Euderma maculatum* | | | √ | | | √ | | |
| Silver-haired bat | *Lasionycteris noctivagans* | | | √ | | √ | √ | | |
| Small-footed myotis | *Myotis ciliolabrum* | | | √ | | √ | √ | | |
| Long-eared myotis | *Myotis evotis* | | | √ | | √ | √ | | |
| Long-legged myotis | *Myotis volans* | | | √ | | √ | √ | | |
| Yuma myotis | *Myotis yumanensis* | | | √ | | √ | √ | | |
| Pallid bat | *Antrozous pallidus* | | | | | √ | √ | | |
| California wolverine | *Gulo gulo luteus* | | | √ | √ | | | √ | |
| Bighorn sheep | *Ovis canadensis* | | | √ | | | √ | | |
| **BIRDS** | | | | | | | | | |
| Bald eagle | *Halieatus leucocephalus* | √ | | | √ | | √ | | |
| Mountain quail | *Oreortyx pictus* | | | √ | | | √ | | |
| Ferruginous hawk | *Buteo regalis* | | | √ | | √ | | | √ |
| Northern goshawk | *Accipiter gentilis* | | | √ | | √ | √ | | |
| Western burrowing owl | *Athene cunicularia hypugea* | | | √ | | √ | | √ | |
| Lewis' woodpecker | *Melanerpes lewis* | | | √ | | √ | √ | | |
| Willow flycatcher | *Empidonax trailli adastus* | | | √ | | | | √ | |

| Species | Scientific Name | US | | | OR | | Observed | | Expected |
|---|---|---|---|---|---|---|---|---|---|
| | | T | C | SC | T | S | 00-03 | Prior | |
| Yellow-breasted chat | *Icteria virens* | | | √ | | | √ | | |
| Tricolored blackbird | *Agelaius tricolor* | | | √ | | √ | √ | | |
| Swainson's hawk | *Buteo swainsoni* | | | | | √ | | √ | |
| Sandhill crane | *Grus canadensis* | | | | | √ | √ | | |
| Flammulated owl | *Otus flammeolus* | | | | | √ | | √ | |
| Northern pygmy owl | *Glaucidium gnoma* | | | | | √ | √ | | |
| White-headed woodpecker | *Picoides albolarvatus* | | | | | √ | | √ | |
| Black-backed woodpecker | *Picoides arcticus* | | | | | √ | | √ | |
| Horned lark | *Eremophila alpestris* | | | | | √ | √ | | |
| Bank swallow | *Riparia riparia* | | | | | √ | √ | | |
| Pygmy nuthatch | *Sitta pygmaea* | | | | | √ | | √ | |
| Loggerhead shrike | *Lanius ludovicianus* | | | | | √ | √ | | |
| **AMPHIBIANS** | | | | | | | | | |
| Columbia spotted frog | *Rana luteiventris* | | √ | | | √ | | | √ |
| Western toad | *Bufo boreas* | | | | | √ | √ | | |
| **FISH** | | | | | | | | | |
| Middle Columbia summer steelhead | *Oncorhyncus mykiss* | √ | | | | | √ | | |
| Pacific lamprey | *Lampetra tridentata* | | | √ | | | √ | | |
| Interior redband trout | *Oncorhyncus mykiss gibbsi* | | | √ | | | √ | | |
| **INVERTEBRATES** | | | | | | | | | |
| Lynn's clubtail dragonfly | *Gomphus lynnae* | | | √ | | | | | √ |
| **PLANTS** | | | | | | | | | |
| Washington monkeyflower | *Mimulus washingtonensis var. washingtonensis* | | | √ | | | | | √ |
| Little mousetail | *Myosurus minimus ssp. apus (= var. sessiliflorus)* | | | √ | | | | | √ |
| Arrow-leaf thelypody | *Thelypodium eucosmum* | | | √ | | | | | √ |

US = USFWS, OR = Oregon, T = Threatened, C = Candidate, SC = Species of Concern, S = Sensitive

# X. WILDLIFE & FISH

## A. Wildlife

The Conservation Area provides habitat for a diverse assemblage of terrestrial wildlife species. The list of terrestrial vertebrate species known or expected to occur on the Conservation Area includes 6 amphibians, 14 reptiles, 172 birds, and 67 mammals (Appendix A).

### 1. Game Species

Big game species on the Conservation Area include mule deer (*Odocoileus hemionus*) and Rocky Mountain elk (*Cervus elaphus*), each of which are abundant enough to support limited public and tribal hunting. Bighorn sheep and pronghorn antelope (*Antilocapra americana*) also occur, but are not currently numerous enough to support hunting on the property.

Native upland game birds include California Quail (*Callipepla californica*) and Mountain Quail (*Oreortyx pictus*; not currently a game species due to recent population declines). Introduced Ring-necked Pheasants (*Phasianus colchicus*) and Chukar (*Alectoris chukar*) are well established, and Wild Turkey (*Meleagris gallopovo*) have been observed on the property. Migratory game birds include Mourning Doves (*Zenaida macroura*) in the uplands, and waterfowl (esp. Mallard (*Anas platyrhyncos*) and Canada Goose (*Branta canadensis*)) that use the creek and river.

### 2. Wildlife Habitat Conservation and Management Plan

Pine Creek Conservation Area is enrolled in the Wildlife Habitat Conservation and Management Program through Oregon Department of Fish and Wildlife. This program allows ODFW to insure that the property is being managed for the benefit of fish and wildlife habitat, and allows the Tribes to receive a deferred property tax rate from Wheeler County. The property was enrolled in the program through completion of a Wildlife Habitat Conservation and Management Plan (WHCMP) that has been approved by ODFW (Appendix B). The program has been approved by the Wheeler County Commissioners, and the Conservation Area is therefore eligible to be taxed at a rate equivalent to the deferred ranch tax rate. In order to receive this deferred tax rate, the WHCMP must be followed, and ODFW is responsible for monitoring its implementation. This Wildlife Habitat and Watershed Management Plan is more detailed than the WHCMP, but fully compatible with it. Implementation of this plan will support the objectives of the WHCMP.

## B. Fish

The John Day River was historically one of the most significant anadromous fish producing rivers in the Columbia River basin. The John Day River spring chinook salmon and summer steelhead populations are two of the last remaining intact wild populations of anadromous fish in the Columbia River basin, however, both populations are depressed relative to historic levels (Knapp, et al., 2001). Recent runs of spring chinook salmon (2,000 – 5,000 fish) and summer steelhead (5,000-40,000 fish) are a fraction of their former abundance.

An estimated 27 species of fish, including 17 native species, are found in the John Day River subbasin. Of these, 13 are considered to occur basin-wide, and 6 in the Lower Mainstem of the John Day (Table 5; the remaining 8 species occur in higher elevation portions of the basin or in lakes and ponds).

Among these species, only steelhead / redband trout and speckled dace are known to occur in Pine Creek. Other native species may occur, but none of the introduced species abundant in the lower river are likely to use small low-elevation tributaries such as Pine Creek.

### 1. Steelhead and Trout in Pine Creek

**Summer Steelhead (*Oncorhynchus mykiss*)**

The John Day River supports what may be the largest wild run of summer steelhead in the Columbia River basin with an estimated run of between 5,000 and 40,000 fish. No hatchery steelhead have been released in the John Day River subbasin since the late 1960's, and those releases were from a stock that had very little probability of survival (Knapp, et al., 2001)

Stray hatchery fish from other drainages have been observed during incidental and statistical creel programs since 1986, with what appears to be an increasing trend. Stray hatchery steelhead (ad-clipped) are removed in the lower river to minimize the potential for negative interactions between out-of-basin strays and wild fish. Stray concentration is greatest near the mouth of the river.

Low, warm water in the lower John Day River during summer months precludes adult summer steelhead from exiting the Columbia River and entering the John Day until mid- to late September (Figure 7). After entering the John Day River, they gradually move upriver entering spawning tributaries along the way. Spawning commences in April in lower river tributaries and continues through mid-June in high elevation tributaries of the North Fork. Emergence of summer steelhead fry is usually complete by mid-July.

Very little life history or genetic information has been collected on summer steelhead within the John Day sub-basin. Available information indicates steelhead smolt primarily as 2-year-olds (74%) and spend one year (58%) in the ocean before returning as adults. A smaller proportion of fish smolt as either 1- or 3-year-olds (10% and 16%, respectively) or spend 2 years in the ocean (39%) before returning as an adult.

Steelhead spawning and rearing habitat in Pine Creek extends from the mouth upstream at least 10 miles, beyond the upper property boundary of Pine Creek Conservation Area, and in Robinson Canyon and its tributary Little Pine Canyon.

ODFW monitors the steelhead population within the John Day sub-basin with spawning ground surveys each spring on approximately 85 miles of tributaries, including 3 to 4 miles on Pine Creek. Spawning densities vary considerably (Figure 8) depending on environmental conditions, including ocean productivity. Redd counts on Pine Creek vary from a high of 18.7 redds/mile in 1987 to zero redds in 1994, 1998, and 2000. A downward trend throughout the basin is indicated for the past 40 years.

In March 1999, the National Marine Fisheries Service (NMFS) listed the John Day River summer steelhead as a threatened species as part of the Middle Columbia Evolutionarily Significant Unit (ESU) under the Endangered Species Act (ESA). In contrast to the NMFS finding, Chilcote (2001) found that John Day subpopulations were at no risk to extinction.

**Redband Trout (*O. mykiss gibbsi*)**

Redband trout are the resident, non-anadromous form of steelhead, with which they are conspecific. They are found throughout the John Day sub-basin, and difficult to distinguish from juvenile anadromous *O. mykiss*. Spawning of the two types overlaps and they are not reproductively isolated.

It is not known what extent of the *O. mykiss* population in Pine Creek is resident or anadromous. The ESA listing of Summer Steelhead as Threatened excluded resident redband populations, which are currently considered a Species of Concern at the Federal level, and Sensitive at the State level.

Throughout this plan, discussion of steelhead habitat on the Conservation Area will be assumed to also refer to habitat for resident redband trout.

## 2. Species of Note in the Lower John Day River

**Spring Chinook Salmon *(Oncorhynchus tschawytscha)***

Spring chinook salmon adults enter the John Day River in May and June, and arrive at spawning and rearing areas in the Upper John Day and tributaries by early July. Fish spawn from late August through late September (Figure 7). Juveniles migrate downstream in the spring one year following emergence (Knapp, et al., 2001). Pine Creek Conservation Area is relevant to spring Chinook salmon for its watershed function, but not as current spawning habitat.

**Fall Chinook Salmon *(Oncorhynchus tschawytscha)***

A remnant run of fall chinook salmon spawns sporadically in the lower river below Cottonwood Bridge (RM 38). It is believed fish historically spawned below Tumwater Falls (RM 10), which

were part of a larger population spawning in the mainstem Columbia, that was all nearly extirpated when John Day Dam was constructed on the Columbia (Knapp, et al., 2001).

**Coho Salmon (*Oncorhynchus kisutch*)**

Coho salmon historically occurred in the Middle Fork of the John Day River, but have been extirpated from the John Day Subbasin (Knapp, et al., 2001).

**Pacific Lamprey** (*Lampetra tridentata*) and **Western Brook Lamprey** (*L. richardsoni*)

Little is currently known about the status of lamprey in the John Day sub-basin, although research is underway (Knapp, et al., 2001). Lamprey are a traditional tribal food, and are of cultural significance to the Tribes.

**Smallmouth Bass** (*Micropterus dolomieui*)

The John Day River is nationally known for supporting a fishery of smallmouth bass. Smallmouth bass were initially stocked in the lower river in 1971, and the population has expanded to all suitable habitat. A concern exists that smallmouth predation may impact migrating salmonids in the John Day, although one study concluded that this predation was not significant (Knapp, et al., 2001).

## 3. Role of Pine Creek Conservation Area in Regional Fish Recovery

The National Marine Fisheries Service's recent Biological Opinion on the federal Columbia River hydropower system recognizes the importance of the John Day sub-basin to fish and wildlife restoration efforts (NMFS 2000).

The Draft Sub-basin summary (Knapp, et al., 2001) identifies habitat protection and/or restoration as the most critical need in the sub-basin, which if addressed "would provide the greatest long-term benefit for both fish and wildlife within the sub-basin". The sub-basin summary also acknowledges the importance of addressing mainstem passage and ocean/estuary survival to complement in-basin habitat restoration efforts.

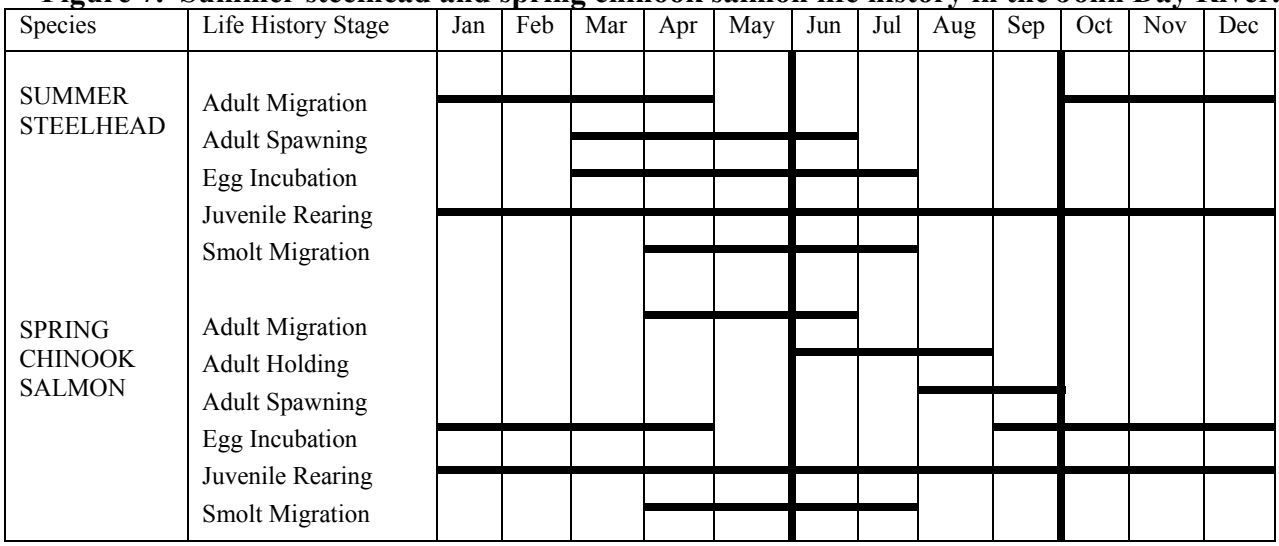
Fish managers have agreed to fisheries goals and objectives through the *U.S. v. Oregon* and NWPPC planning process. The John Day River will be managed for production of wild anadromous fish and increased production from the basin will be attained primarily by protecting high quality habitat and by improving degraded habitat.

**Table 5. Fish Species known or expected to occur on Pine Creek Conservation Area.** Modified from Draft Subbasin summary, NWPPC 2001, to include only species of John Day basin-wide or lower mainstem distribution. Spring Chinook are included due to their migratory use of the lower mainstem. Special status species are in bold text.

| Species | Origin | Location | Status |
|---|---|---|---|
| Torrent sculpin (Cottus rhotheus) | N | B | C |
| Mottled sculpin (Cottus bairdi semiscaber) | N | B | C |
| Spring chinook (Oncorhynchus tschawytscha) | N | UM, NF, MF | C |
| Summer steelhead (Oncorhynchus mykiss) | N | B | T |
| Redband trout (Oncorhynchus mykiss gibbsi) | N | B | S |
| Speckled dace (Rhinichthys osculus) | N | B | C |
| Longnose dace (Rhinichthys cataractae dulcis) | N | B | C |
| Redside shiner (Richarsonius balteatus balteatus) | N | B | C |
| Chiselmouth (Acrocheilus alutaceus) | N | B | C |
| Carp (Cyprinus carpio) | I | LM | C |
| Bridgelip sucker (Catastomus columbianus) | N | B | C |
| Largescale sucker (Catastomus macrocheilus) | N | B | C |
| Northern pikeminnow (Ptychocheilus oregonensis) | N | B | C |
| Pacific lamprey (Lampetra tridentata) | N | B | S |
| Brook lamprey (Lampetra richardsoni) | N | B | U |
| Black bullhead (Ictalurus melas) | I | LM, L | O |
| Brown bullhead (Ictalurus nebulosus) | I | LM, L | O |
| Channel catfish (Ictalurus punctatus) | I | LM | C |
| Largemouth bass (Micropterus salmoides) | I | LM, L | O |
| Smallmouth bass (Micropterus dolomieui) | I | LM, UM, NF | C |

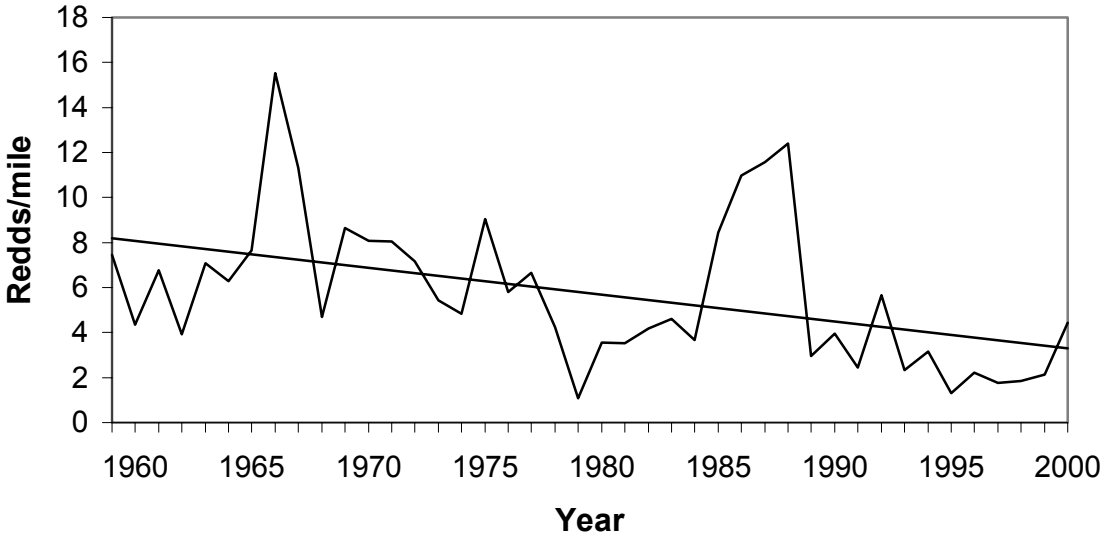
I=Introduced, N=Native, L=Lakes or ponds, B=Basinwide, LM=Lower Mainstem, UM=Upper Mainstem, MF=Middle Fork, NF=North Fork, C=Common, O=Occasional, S=Sensitive, T=Threatened

**Figure 7. Summer steelhead and spring chinook salmon life history in the John Day River.**



Source: USDI 2000

**Figure 8. Spawning density (redds/mile) of summer steelhead in the John Day Subbasin, 1959 – 2000.**



# XI. WATER RIGHTS

Data on water rights was supplied by Bancroft Appraisal Company, Oregon Water Resources Department, and Oregon Water Trust (Table 6).

Water rights on both Pine Creek and the John Day River were acquired with the Conservation Area. Most of the water rights were originally obtained prior to 1909, and are therefore decreed, not permitted.

According to the Oregon Water Trust, the tribe's water rights on Pine Creek are among the most senior rights on the creek. This is important as far as low flows are concerned because if the water rights were turned over to instream rights, that water could not be appropriated by other users, thus assuring more flow during the critical summer months. The percent of the total flow the tribe owns is substantial. The OWT assessment shows the tribes water rights on Pine Creek total 2.48 cfs from June 1 to the end of the irrigation season.

The rights for the John Day include both relatively senior rights from 1900, and relatively junior rights from 1982 and 1983. The rights to the John Day River near the mouth of Pine Creek are permitted, not certified. Certified rights are recognized as final and binding by the OWRD, whereas permitted rights are those with an application for certification pending. This process can take years to finalize. The John Day water rights have been applied for and a permit issued for them, but there is no certificate. Only certificated, primary rights may be leased for instream use.

The prior owner of Pine Creek Conservation Area provided documentation of recent irrigation history on the Conservation Area to the Tribes. The Tribes leased water rights on Pine Creek to instream use for 2001 by Lease Agreement Number 190 with OWT and OWRD, and renewed that lease, as well as the instream lease on Wagner Ranch water rights, for 2002. The Wagner Ranch water rights are leased instream through September 30, 2007. Pine Creek water rights were leased instream for 2003, and the Tribes are working with OWT on a permanent instream transfer of Pine Creek water rights. The Tribes intend to donate these water rights to OWT in order to permanently transfer them to instream water rights.

**Table 6. Pine Creek Conservation Area Water Rights**

| Applic. # | Per.# | Cert. # | Priority | Permit Name | Type | Source | CFS | | Twn | Rng | Sect | Right Acres |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Apr1-Jun1 | Jun1-Sep30 | | | | |
| Decreed | | 25332 | 1870 | C. Hilton and C.E. Burgess | Prim. | Pine Creek | 0.8 | 0.4 | 7S | 19E | 33 | 12.5 |
| | | | | | | | | | | | 34 | 10.00 |
| | | | | | | | | | 8S | 19E | 3 | 10.00 |
| Decreed | | 25333 | 1872 | C. Hilton and C.E. Burgess | Prim. | Pine Creek | 0.09 | 0.045 | 8S | 20E | 3 | 3.6 |
| Decreed | | 25334 | 1874 | C. Hilton and C.E. Burgess | Prim. | Pine Creek | 0.48 | 0.24 | 7S | 20E | 31 | 3.00 |
| | | | | | | | | | | | 32 | 0.20 |
| | | | | | | | | | 8S | 20E | 5 | 16.00 |
| Decreed | | 25335 | 1874 | C. Hilton and C.E. Burgess | Prim. | Pine Creek | 0.187 | 0.09 | 8S | 20E | 4 | 7.50 |
| Decreed | | 25365 | 1870 | A. L. Huntley | Prim. | Pine Creek | 1.84 | 0.92 | 7S | 19E | 36 | 52.40 |
| | | | | | | | | | | 20E | 31 | 21.20 |
| Decreed | | 25167 | 1881 | First National Bank | Prim. | Pine Creek | 0.357 | 0.178 | 8S | 20E | 1 | 3.30 |
| | | | | | | | | | | | 2 | 11.00 |
| Decreed | | 24919 | 1871 | George Bowley | Prim. | Pine Creek | | Unk. | 7S | 19E | 34 | 9.00 |
| | | | | | | | | | | | 35 | 19.60 |
| Decreed | | 25462 | 1871 | Ellen Lee: Edward Lee Estate | Prim. | Pine Creek | 0.557 | 0.278 | 7S | 19E | 35 | 22.30 |
| Decreed | | 25523 | 1880 | WJ McGreer | Prim. | Pine Creek | 0.34 | 0.17 | 8S | 19E | 4 | 13.90 |
| T6736 | D25739 | 67640 | 1900 | Derby Smith Partners | Prim. | John Day R. | 1.425 | | 9S | 19E | 12 | 39 |
| | | | | | | | | | | | 13 | 10.8 |
| T6737 | D25739 | 68636 | 1900 | Derby Smith P. | Prim. | John Day R. | | | | | 13 | 7.2 |
| S 64855 | S47613 | 67885 | 1983 | Derby Smith Partners | Prim. | John Day R. | 0.525 | | 9S | 19E | 12 | 19 |
| | | | | | | | | | | | 13 | 2.4 |
| T6737 | S47613 | 68638 | 1983 | Derby Smith Partners | Prim. | John Day R. | 0.095 | | 9S | 19E | 12 | 0.2 |
| | | | | | | | | | | | 13 | 3.6 |
| S63407 | S46754 | n/a | 1982 | W. Dan Eddleman | Prim. | John Day R. | 2.62 | | 7S | 19E | 33 | 26.40 |
| | | | | | Sup. | | | | | | 33 | 12.50 |
| | | | | | Prim. | | | | | | 34 | 8.60 |
| | | | | | Sup. | | | | | | 34 | 9.70 |
| | | | | | Prim. | | | | 8S | 19E | 3 | 10.00 |
| | | | | | Prim. | | | | | | 3 | 15.00 |
| | | | | | Prim. | | | | | | 4 | 8.60 |
| | | | | | Sup. | | | | | | 4 | 13.90 |

# XII. CULTURAL AND HISTORIC RESOURCES

## A. General Guidelines

In the MOA between BPA and the Tribes, both parties agree that management planning for historic and cultural resources will be integrated with wildlife management practices as a means of avoiding impacts to cultural and historic resources. (MOA Section 3. b.) The MOA further requires that cultural resource surveys be conducted prior to conducting non-exempt ground disturbing activities, that sensitive sites be avoided if at all possible, and that only ground disturbing activities identified in this plan may be undertaken.

The Tribes further intend to comply with the Warm Springs Integrated Resources Management Plan (IRMP); Tribal Ordinance 74, Warm Springs Tribal Code, Chapter 490, Protection and Management of Archaeological, Historical and Cultural Resources (Tribal Ordinance 68), ORS 97.740-97.760: Indian Graves and Protected Objects, ORS 358.905-358.955: Archaeological Objects and Sites, OAR 736-051-0090: Permit and Conditions for Excavation or Removal of Archaeological or Historical Material on Private Lands, ORS 390.805-390.925: Scenic Waterways, and Section 106 of the National Historic Preservation Act (NHPA) and other applicable federal and state regulations that require federal agencies to identify and assess the effects of their actions on historic resources listed in or eligible for the National Register of Historic Places (NRHP).

## B. Background Research

In conjunction with acquisition of the original Pine Creek Ranch, Scott Stuemke authored a report titled "An Archaelogical and Ethnographic Literature Review for the Pine Creek Ranch, Wheeler County, Oregon" (1999). With acquisition of the Wagner Ranch, Sally Bird completed a similar report, titled "An Archaelogical and Ethnographic Literature Review for the Wagner Ranch of Wheeler County, Oregon" (2002).

Complete cultural resource surveys have not been conducted on the property, so these reports relied primarily upon literature review. These reports identify a long history of native American use of the Pine Creek Conservation Area lands, followed by a period of Euroamerican settlement that included higher population densities than those currently maintained in the area.

## C. Management Practices

The following management practices will be followed to protect and avoid impacts to cultural and historic resources:

1. The Warm Springs Department of Cultural Resources will account for the documentation, protection, and preservation of the archaeological, historical, and sensitive sites.

2. Projects must be designed to avoid or mitigate impacts to significant cultural resources in accordance the Tribal Ordinances 56, 68 and 74, the NHPA, and other applicable federal and state laws.
3. The Tribes Department of Cultural Resources will be notified of proposed projects by submitting a Request for Cultural Resource Information. The Cultural Resource staff, comprised of qualified archaeologist, ethnographer, and/or technicians, will complete the following procedures before proposed projects are implemented:

    a. An archaeological inventory will be conducted within the area where ground-disturbing activities might occur to determine if there are any known archaeological or historic properties located within the project area.
    b. Inventories will be conducted in accordance with Oregon State Historic Preservation Office standards and in accordance with tribal and federal law.
    c. If sites are located the Tribes Department of Cultural Resources will provide mitigation recommendations.
    d. The Culture and Heritage Committee and their designated elders will be consulted with on a case-by-case basis.
4. Cultural resources will be evaluated by the Tribes Department of Cultural Resources to determine eligibility for listing on the NRHP. The evaluation will be conducted in accordance with the NHPA.
5. If objects or sites of cultural value, such as historical or Native American structures or artifacts, human remains or grave markers, or fossils are encountered during management activities, all site disturbing operations within the vicinity of the resource will be immediately suspended and the appropriate Cultural Resources staff member will be notified of the findings.

# XIII. BUILDINGS AND STRUCTURES

## A. Manager's Quarters

The Manager's Quarters for the Pine Creek Conservation Area is located at 39067 Highway 218, near the intersection of Highway 218 and Clarno Road. This is near the mouth of Pine Creek in Sec. 33 T7SR19E. The residence is a pre-fabricated house on a daylight basement foundation. There are 4 bedrooms, 2 and ½ baths, a kitchen/dining room, 2 living rooms, storage closets, and a deck. The largest bedroom, in the basement, serves as the Pine Creek Conservation Area office. The house is the residence for the Conservation Area Manager and family and is used for meetings. Outbuildings include a well house, a metal-roofed pole-built shop with two sliding garage doors, and a small kennel shed. The shop is used to house and maintain Conservation Area tools and equipment.

## B. Lee Homestead / Potter Place

The Lee Homestead, also known as the Potter Place, is located at 39767 Highway 218, approximately 1.5 miles east of the manager's quarters, in Sec. 35 T7SR19E. This site includes several historic buildings as well as a pole-built shop with metal roof and siding and a 1978 mobile home. The Tribes have not yet had access to utilize these premises due to a lifetime lease arrangement made by a prior owner. The mobile would require repair to the well system before it could be used as a residence for an assistant manager.

## C. "Juniper Corrals"

There are set of livestock corrals, with juniper-post and steel cable construction located near mile marker 30 on Highway 218 in Sec. 5 T8SR20E. These corrals will be maintained for temporary use to manage trespass livestock or horses used for management purposes. There are several metal-roofed shops located at the edge of the corrals.

## D. Wagner Ranch

There is a small house and a few outbuildings located on the Wagner Ranch, near the John Day River in Sec. 13 T9SR19E. The house is partly finished, and has electricity, a well, and septic. A wood stove is the only heat source. This facility may be useful during future work on the Wagner Ranch portion of the Conservation Area. The outbuildings include a small workshop and a metal-roofed shed without walls.

## E. Rattlesnake Cabin

There is a juniper cabin located in Rattlesnake Canyon. The cabin includes no utilities or furnishings and is primarily useful as a shelter. Conservation Area employees, contractors, or visitors may use this cabin.

# XIV. INTRODUCED PLANT SPECIES MANAGEMENT

## A. General Guidelines

Introduced plant species are numerous on the Conservation Area, as they are throughout North America. While maintaining communities of native vegetation is a management goal for the property, it is recognized that introduced species will always be a component of the Conservation Area vegetation.

Action will be taken to control an introduced species after careful consideration indicates leaving the plant unchecked will result in more damage than controlling it with available methods. Weed control will focus on the effort to restore native species and communities to the areas currently occupied by noxious weeds. Preventative efforts will focus on avoiding infestations of species currently not present, but known to be problematic in the region.

Weed management will follow an adaptive management strategy, based upon:

- Identifying species that interfere with management goals
- Prioritizing these species based upon their impacts
- Evaluating available control methods
- Developing and implementing control plans
- Monitoring management results

Weed management priorities will be based upon the goal of efficiently managing infestations, and minimizing the long-term workload. New infestations and existing infestations with the greatest potential to rapidly spread and impact a wide area will receive high priority. Probability of success is also considered, giving the technologies and resources available.

## B. Assessment of Current Conditions

Due to the long history of human use of the area, the current vegetation of the Conservation Area includes a mixture of native species and species introduced deliberately or inadvertently by people. The working draft plant list for the Conservation Area (Appendix C) includes nearly 300 species of native plants known or expected to occur on the Conservation Area, and over 100 introduced species.

Introduced species range from widespread throughout the property (cheatgrass, some other annuals) to extremely local in occurrence (black locust). Similarly, introduced species vary in their ability to invade natural vegetation. Species such as yellow star-thistle are considered highly invasive, while others, such as cereal grains, are unlikely to spread beyond the area where they were planted.

The species currently identified as high priority species are:

Perennial pepperweed (*Lepidium latifolium*)
Russian knapweed (*C. repens*)
Whitetop (*Cardaria draba*)
Yellow star-thistle (*Centaurea solstitialis*)
Leafy spurge (*Euphorbia esula*)
Dalmatian toadflax (*Linaria dalmatica*)
Scotch thistle (*Onopordum acanthium*)
Himalayan blackberry (*Rubus discolor*)
Diffuse and spotted knapweeds (*C. diffusa* & *C. maculosa*)

## C. Weed Management Plan

The Habitat Manager has developed a draft weed management plan for the Conservation Area following a Site Weed Management Plan template created by The Nature Conservancy. This template provides a planning structure compatible with the adaptive management strategy and general principles identified above. This draft will be revised with input from the Wheeler Weed Board.

## D. Work Completed to Date:

A survey of noxious weeds in the floodplains of Pine Creek was conducted under ODA Weed Grant #694 GR by Larry and LaRee Hyder. In conjunction with this survey, herbicidal treatment of yellow star-thistle and knapweeds was conducted by Floyd Paye of the Jefferson County Public Works Dept., using Transline (clopyralid).

After the July 2000 wildfire, knapweed rosettes were abundant in 32 acres of burned floodplain fields. This area was treated with the herbicide Curtail (clopyralid & 2,4 D) in November 2000 by Wilbur Ellis, Inc., under contract to Pine Creek Conservation Area. A 41 acre area extending beyond the sprayed 32 acres was subsequently broadcast seeded with Triticale in December 2000 by Dan Greenfield to provide competition with knapweed. This seeding was conducted using funds from the ODA Weed Grant. This area will need repeated control of knapweed, and restoration to native species within a few years.

In 2001, the Tribes received additional ODA Weed Grant funding, and contracted with Jefferson County Public Works for herbicidal control of yellow star-thistle, Russian knapweed, Scotch thistle, Whitetop, and Russian olive. Biocontrol agents (yellow star-thistle hairy weevil, Eustenopus villosus) were released on a yellow star-thistle population along Pine Creek. Weed control has continued in 2002 and 2003.

## E. Herbicide Use Guidelines

The following guidelines are derived from draft herbicide use guidelines from TNC's Wildland Invasive Species Program.

Carefully consider the overall impacts of herbicide use on conservation goals, native species, and the ecological system. Base all decisions whether to control weeds, and whether to use herbicides instead of other methods, on the management goals for the site.

In addition, the health and safety of applicators and others in the vicinity must be considered **BEFORE** pesticides are applied. Simply put, one should be confident that the proposed herbicide will do more conservation good than harm and not endanger the health of the applicators or others in the area. If herbicide is used, reasons for doing so must be recorded.

## 1. Site Conditions

Site conditions to consider include accessibility, proximity to open water, depth to groundwater, the presence of rare species and other conservation targets, and the site's sensitivity to trampling that could occur when the herbicide is being applied.

To prevent contamination of water bodies, management plans should carefully consider the hydrology of the system that is being treated. Hypothesize potential runoff scenarios and take appropriate measures (such as buffer zones) to prevent them. Underground aquifers and streams should be considered as well.

## 2. Regulations

Follow all federal, state and local regulations regarding herbicide use. It is a violation of federal law to use an herbicide in a manner inconsistent with its label.

Herbicides may be applied only by employees or contractors who have all certificates and licenses required by the state and/or county. Volunteers may NOT apply herbicides unless they are properly licensed AND have signed a consent & release form. Applicators MUST wear all protective gear required on the label of the herbicide they are using.

## 3. Herbicide Properties

Consider the following herbicide properties when deciding which compound to use:

1. Effectiveness against the target species.
2. Mechanisms of dissipation (persistence, degradation, and likelihood of movement via air or water to non-target organisms).
3. Behavior in the environment (in soils, water, and vegetation).
4. Toxicity to birds and mammals, aquatic species, and to other non-target organisms (including algae, fungi, and soil organisms).
5. Application considerations
6. Safety
7. Human toxicology

In general for work in natural areas, it is best to select compounds that are effective against the weed, not likely to drift, leach to groundwater or wash into streams, nontoxic to people and other

organisms, not persistent in the environment, and is easy to apply. In some circumstances, a single application of a more toxic or persistent chemical that kills the weed, however, may be preferable to a less persistent, less toxic compound that must be applied repeatedly. Strive to do the job with the smallest **total** negative impact to the environment. Information on types of herbicide available and appropriate application rates can be found in the Pacific Northwest Weed Control Handbook.

### 4. Posting Treated Areas

Federal requirements for posting treated areas, if any, are listed on the herbicide label. Glyphosate, triclopyr and most other herbicides used in natural areas have no federal posting requirements. Always keep treated areas off limits to the public at least until the herbicide dries. Treated areas may be kept off limits for longer periods if the herbicide is persistent in the environment.

Post notices of herbicide applications at all information kiosks. The posting should include a notice that the area has or will be treated, the name of the herbicide used, the date of the treatment, appropriate precautions to be taken, the date when re-entry is judged to be safe, and a phone number for additional information. The notices should be removed after it is judged safe to re-enter the area.

### 5. Record Keeping

When using herbicides it is critical (and, in some cases, required by law) to keep records of all plants/areas treated, amounts and types of herbicide used, and dates of application. This information will be important in evaluating the project's success, improving methodology, and identifying mistakes. In addition, it documents the procedure for future site managers and biologists. Records of abundance/condition of the targeted weeds and nearby desirable plants before and after treatment will also be valuable in evaluating the effectiveness of the herbicide.

## F. Vegetation Restoration Projects

Selecting appropriate plant materials and methods to use in restoration projects is challenging. Site conditions typically include highly impacted areas, and competition from weeds is often intense. In most situations, it will be appropriate to attempt to restore a mixture of species, including perennial grasses and forbs. Shrub species provide numerous wildlife benefits and should be considered as well. (Vallentine, 1986)

### 1. Native vs. Non-Native Species

Locally adapted native plant materials are the ideal goal of restoration projects on the Conservation Area, however, non-native plants may need to be used when natives are unlikely to establish. Using local genetic material in restoration projects helps prevent loss of biodiversity that can occur from importing plant materials from different populations of native species.

- Utilize native materials from the local region. Avoid importing native plant materials from more than 300 miles north or 200 miles south of their origin, or from populations

that have been demonstrated to differ significantly from the local population. The use of carefully selected non-native plant species is preferred to the use of native species from outside of the local region.

- Utilize as diverse a local source population as possible. If collecting seed, sample from sites at varying elevations and aspects within the John Day Basin. By sampling a large population, appropriate genetic material for the site may be re-introduced, and a diverse local population will be more likely to survive varying climatic conditions or other stresses.

Site conditions and availability of appropriate materials may prohibit use of native plant materials in certain projects. If a site has experienced heavy impact and lost the characteristics that native plants need (such as loss of the A-horizon of the soil, compaction, soil structure, moisture holding capacity, frost heaving, etc) non-natives may be the only vegetation that will survive on the site. A site may need to be seeded with non-native species in order to build up organics on the site, capture soil resources, re-establish a soil profile, break up compacted surface crust, re-establish horizontal channels for water to move into the soil, etc.

Non-native species used in restoration plantings should:

- Be comparable to native species in ecosystem functionality, or differ in a manner likely to contribute to restoring ecosystem functionality.

- Be unlikely to invade intact native vegetation communities.

- Be amenable to future restoration of native plants.

## 2. Restoration Methods

Vegetation can be restored through seeding or transplanting whole plants in several manners. The method selected will depend upon the site conditions and the likelihood of success of restoring the desired species. Ground disturbance for the purposes of vegetation restoration will be an accepted management practice for the project, subject to cultural resources review.

**Seeding**

Seeding is relatively inexpensive compared to whole plant methods. Seeds are often available from commercial growers, especially for grass species. Seedbed preparation may be required, and competition from weeds may require herbicide use. Irrigation may be appropriate depending upon the species used.

*Seed Availability*

- Seed growers can propagate locally collected seed on a contract basis. Seed will typically be available for planting 2-3 years after initial collection.

- Native species are often available from commercial growers as genetically homogeneous cultivars rather than locally adapted populations.
- Seed costs and availability can vary widely, depending upon demand. Regional demand for native seed is high after intense fire seasons.
- Seed for perennial grasses is more widely available than for forbs or shrubs.
- Non-natives are widely available from commercial seed growers

**Whole Plant Methods**

Transplanting whole plants may be the only way to establish some species. This is especially true for some drought-tolerant shrubs (Van Epps and McKell, 1980). Seeding may be less effective because the seed of some long-lived woody plants germinates infrequently and their seedlings grow slowly (Whisenant, 1999). Planting whole plants bypasses the vulnerable seed establishment and seedling stages and provides greater success. In difficult to establish sites, transplanting seedlings brings more reliable establishment (Whisenant, 1999).

*Wildings*

Wildings are plants removed from natural settings and transplanted at repair sites (Munshower, 1994). Wildings are not commonly used due to costs and low wildland survival rates. Adequate sources for transplants are often lacking.

*Bare-root Stock*

Bare-root seedlings are typically grown for 8 to 10 months in outdoor nurseries before removing them from the soil for transplanting. They are hardier, older, easier to transport and less expensive than container grown plants. They also do not become root bound as do container grown plants. They establish as well as containerized stock under good conditions – but under dry or harsh conditions do not fare as well (Whisenant, 1999).

*Container-grown Stock*

Containerized planting stock is grown in greenhouses or outdoor facilities. Container-grown seedlings are the most reliable method for establishing woody plant seedlings in arid and semiarid ecosystems (Vallentine, 1989). Bare-root seedlings of many shrub and forb species require 1 to 2 years growth before transplanting into arid or semiarid rangelands, containerized seedlings may be transplanted after 12 weeks. Long, narrow paper containers (plant bands) are being used to grow shrub seedlings destined for desert planting. The seedlings in these containers grow deep root systems especially when watered from below.

Container grown plants tolerate competition and harsh environmental conditions more readily than seeded or bare-root transplants. In southern California, where competition from annual weeds prevented the re-establishment of coastal sage scrub, restoration was made possible through the use of container-grown stock (Eliason & Allen, 1997). The root development and volume provide significant advantages that can make the difference between success and failure in arid environments (Whisenant, 1999).

# XV. GRAZING

## A. Memorandum of Agreement

The Memorandum of Agreement between BPA and the Confederated Tribes specifically prohibits grazing of domestic livestock or feral horses and cattle on the property unless used as a method to manage for wildlife, as outlined in this site specific management plan and approved by BPA.

## B. Pack Animals

Limited grazing by pack animals will occur within the context of utilizing pack animals for management purposes or for big game hunting. Regulations on the property currently prohibit use of pack animals other than for management purposes or by permitted big game hunters.

Pack animals will be used for management purposes only after careful consideration of potential impacts, including the spread of noxious weeds.

The use of pack animals by big game hunters is permitted to facilitate achievement of wildlife management objectives. All feed transported onto Conservation Area property must be weed-free.

## C. Public Land Grazing Allotments

The Tribes hold BLM grazing preference on the Amine Peak, Rim, and Spring Basin Allotments in association with the Pine Creek Conservation Area. As these grazing preferences were acquired with the BPA-funded acquisitions of the Conservation Area, grazing on the allotments is subject to the MOA between the Tribes and BPA.

The frequency, amount, and time of grazing use on public land portions of the allotments is subject to current BLM grazing regulations (Code of Federal Regulations (CFR) part 43), as well as the Spring Basin Allotment Evaluation (dated 8/91), Final Oregon Wilderness EIS (dated 12/89), and John Day River Management Plan, and would need to be coordinated with the Prineville District BLM.

All allotments are currently being rested from livestock grazing. Any future grazing on these allotments, will be undertaken only if livestock grazing appears to be the best tool for maintaining or improving wildlife habitat and watershed values on the public lands, and would require a livestock management plan.

### Allotment #2633- Amine Peak

The Amine Peak Allotment is associated with deeded lands acquired by the Tribes in 2001 as Wagner Ranch.

| | |
|---|---|
| Location* | River Miles 122.0 – 131.6 |
| Miles of river bank*: | private 5.7 public 3.9 |
| Acres within WSR boundaries*: | private 839 public 883 |
| Acres within allotment*: | private 11,062 public 4349 |
| Total AUMs within lease*: | 294 |

The John Day River Management Plan calls for excluding cattle from the riparian area on public lands between river mile 123.6 and 122.0 and limiting normal livestock use on the remainder of the allotment to the March 15 to May 15 period, subject to the special seasonal flow restrictions. The special seasonal flow restrictions prohibit grazing in allotments where cattle have access to the river bank when river flow at the Service Creek gage is below 2,000 cubic feet per second (cfs).

The Tribes intend to continue to rest the Amine Peak Allotment indefinitely. A prescription fire for the majority of the allotment is planned for late summer or early fall 2004.

## Allotment #2649- Rim

The Rim Allotment is associated with deeded lands acquired by the Tribes as part of Pine Creek Conservation Area in 1999; this portion of Pine Creek Conservation Area was traditionally known as the Potter Place.

| | |
|---|---|
| Location* | Contains no river bank, but lies within WSR boundaries. |
| Miles of river bank*: | private 0 public 0 |
| Acres within WSR boundaries*: | private 40 public 300 |
| Acres within allotment*: | private 1606 public 301 |
| Total AUMs within lease*: | 3 |

The Tribes intend to rest the Rim Allotment from livestock grazing indefinitely. The Allotment is 84% private deeded land, and only includes 3 AUMs. Livestock grazing is not an economically feasible habitat management strategy on the public land portion of this allotment.

## Allotment #2536- Spring Basin

The Spring Basin Allotment is associated with deeded lands acquired by the Tribes in 1999 as Pine Creek Conservation Area. The public lands portions of this allotment consist of inholdings within Pine Creek Conservation Area and the major portion of the Spring Basin Wilderness Study Area.

| | |
|---|---|
| Location* | Contains no river bank, but lies within WSR boundaries. |
| Miles of river bank*: | private 0 public 0 |
| Acres within WSR boundaries*: | private 3 public 90 |
| Acres within allotment*: | private 24,280 public 5,363 |
| Total AUMs within lease*: | 146 (total on all public land within allotment, Including inholdings within deeded lands) |
| | 89 (per Wilderness EIS, for portion within WSA). |

The Tribes currently plan to rest the Spring Basin Allotment from livestock grazing indefinitely. If future conditions develop in which a grazing treatment becomes the most appropriate tool to improve wildlife habitat conditions, the Tribes may opt to graze the public land portion of the Spring Basin allotment. The Tribes will evaluate the costs of BLM grazing fees, range improvements, livestock transportation and control; and the predicted economic return from grazing; before final decisions to utilize the allotment are made.

If the allotment is grazed, each treatment will be followed by a minimum of two years of rest. If fire occurs within the allotment, a minimum of two years of post-fire rest will be allowed before livestock grazing. The season of use for the Spring Basin allotment is November 1st - February 28. With 89 AUMs available, 29 head of cattle could be grazed for this period.

Existing allotment and Conservation Area boundary fences would require maintenance and repair before grazing the allotment. New fence would be needed to prevent livestock movement to the Keys Ranch and Bowerman lands. New fence will also be needed from the head of Eagle Canyon north and west, following a ranch road and joining existing Pine Creek Conservation Area boundary fence in Section 12, T8SR19E, to prevent livestock movements into Pine Creek Conservation Area. However, the BLM may consider constructing new fencing within a WSA only where it would truly enhance the wilderness values for which the area was designated and would be substantially unnoticeable. General wilderness values are defined as: roadlessness, naturalness, solitude, and the ability for primitive or unconfined recreation. Additional values for Spring Basin WSA include: geologic features, cultural resources, scenery, unique plant and wildlife habitat, and the opportunities for hiking, photography, and nature study. Fence construction within the WSA would require an environmental assessment including an analysis of the effects on wilderness and consideration of alternate methods of controlling livestock.

Completion of the land exchange between the Tribes and BLM (see Section XX: Land Exchange) would eliminate the need for fence construction within the WSA. Fence maintenance and construction would still be needed on the WSA boundary.

* Data from Record of Decision: John Day River Management Plan, Two Rivers, John Day, and Baker Resource Management Plan Amendments, USDI Bureau of Land Management, February, 2001. Acreages may not be accurate due to boundary adjustments completed by the Tribes after property acquisitions.

## D. Grazing for Weed Control

Grazing may be conducted to target specific noxious weeds prior to restoration of desired plant species. This type of grazing would be limited to carefully controlled use of livestock, most likely goats or sheep that would preferentially graze forbs, including weeds. Any such grazing will be conducted only with a specific plan documenting the purpose of the treatment, the expected benefits, and any risks associated with the treatment. Domestic goats or sheep will not be permitted within the John Day Wild and Scenic River Corridor due to concern about potential disease transmission to native bighorn sheep. If native bighorn sheep expand their habitat use near planned sheep or goat grazing sites, the use of sheep or goats will be discontinued immediately.

## E. Easement Agreement

The Knox Ranch easement (described under Section XVII. C. 3) allows the use of the roadway for "all reasonable and necessary purposes incident to the use, enjoyment and operation of the Knox Ranch consistent with its past and present uses, zoning and land use classification, including livestock operations, agricultural, recreational, and hunting uses". The easement further provides for "pedestrian, equestrian, vehicular, utility, and transportation and movement of livestock and equipment for the benefit of the Knox Ranch." The current and traditional method of movement of livestock through the easement road is a combination of truck hauling and herding cattle on horseback. Herding is necessary because the roadway is not passable for vehicles when wet. This easement results in incidental grazing by livestock while moving in and out of Knox Ranch. The Tribes will further permit construction of a small holding pen adjacent to the easement to contain livestock overnight (construction will include ground-disturbance for post holes, subject to archaeological review) and reduce livestock impacts to spring areas.

# XVI. FENCES

## A. Boundary Fence Conditions

Conditions of boundary fences vary considerably. No complete survey of boundary fences has been conducted. Boundary fences are primarily 3 or 4 strand barbed wire. The majority of the boundary fence is old, and has a combination of steel and occasional wood posts or live juniper trees used as posts. Boundary fences are in need of repair or replacement in several areas, and all areas will continually need spot-repair when damaged by livestock and wildlife. Boundary fence and sign construction will be considered valid management reasons for ground disturbing activities, subject to cultural resources review.

Fences often do not follow boundaries precisely, due to topography. In some cases this has resulted in parcels fenced either inside or outside of the property, independent of their ownership. For example, a 40 acre parcel in the SE ¼ of the SW ¼ of T8SR21E is fenced outside of the Conservation Area, although owned by the Tribes. This is also true of the SE ¼ of the NE ¼ of Sec. 29, T8SR20E. On the other hand, the NW ¼ of the NE ¼ of Sec. 32, T7SR20E, although legally a portion of Knox Ranch, is fenced within Pine Creek Conservation Area boundaries.

Boundaries with BLM lands are sometimes not fenced, because grazing allotments typically span these private / public borders. Smaller parcels of BLM land on the boundaries of Pine Creek Conservation Area are variously fenced to the inside or the outside of the property. In certain cases, no boundary fence exists between BLM and Pine Creek Conservation Area land, as in some areas of the Spring Basin boundary where topography may have been sufficient to limit movement of livestock. Boundaries with BLM land in this area need to be clearly demarcated due to varying hunting access regulations between the Conservation Area and the public land. There are no boundary fences between Wagner Ranch lands and BLM lands within the Amine Peak Allotment.

Boundary fences along Highway 218 are often in poor condition, due to damage by wildlife. These fences are of diminished importance in the central portion of the property where the Tribes own land on both sides of the highway. The fences here currently serve only as boundary markers and to assist in preventing unauthorized vehicle access. With the assistance of volunteers, the Tribes have reduced much of the roadside fence to a single-strand boundary in order to ease wildlife movement.

## B. Interior Fences

Interior fences include older fences that are either downed or partially downed, and some recently constructed fences that are in good condition. Interior fences disrupt natural movement patterns and represent entanglement threats to wildlife.

Interior fences will be removed as funding and/or volunteer labor become available, beginning with older fences that have no current or potential value. As of August 2003, volunteers have removed approximately 12 miles of interior fence.

# XVII. ROADS

## A. State Highway 218

### 1. Location

State Highway 218 (Shaniko – Fossil Highway) passes through the length of the property from west to east. The highway follows the north side of Pine Creek from near its mouth (at Clarno Road) to Lone Pine Creek (at Pine Creek Road). From this confluence, the highway continues upstream on the northwest side of Lone Pine Creek, angling northeast (Figure 1).

### 2. Impacts

Highway 218 is the major access route to Pine Creek Conservation Area. It provides convenient management access, as well as public visibility and access, to the interior of the property and the Pine Creek riparian area. The highway follows a traditional travel route through the Clarno basin, once the stagecoach route between Antelope and Fossil. The road remains a primary travel route for residents and visitors to Wheeler County.

The impacts of Highway 218 include direct physical impacts to the watershed, impacts on wildlife from vehicle traffic, spread of noxious weeds, and the effects of public access and visibility.

The primary physical impact of the highway on Pine Creek is a constraint upon the potential of the channel to meander through its floodplain in certain segments. In most areas, the floodplain is wide enough that the highway presumably has little effect, but in narrow sections of the valley, the roadway clearly occupies a portion of the natural riparian area. This constraining effect may increase the erosive power of flows below these segments.

Traffic on the highway has largely unknown impacts to wildlife, but likely has altered the behavior of some species sensitive to human disturbance. Traffic also has a direct impact on wildlife through mortality from collisions.

Highway 218 is also a potential distribution route for noxious weeds. The Oregon Department of Transportation contracts to have the road shoulders sprayed with an herbicidal sterilant annually, and follows this early spring treatment with later spot spraying. Weed seeds that blow or are washed off the roadway beyond the treatment area have potential to create new infestations, however. Herbicide sprayed on shoulders adjacent to the creek may have deleterious impacts on fish and other aquatic species.

The most significant impact of the highway, however, is its role in providing ready access through the property. This is convenient for management purposes, and facilitates restoration and monitoring work along Pine Creek. It also provides convenient access for visitors to the property. Local residents and travelers appreciate the opportunities to view wildlife from the highway. On the other hand, the highway provides access for people violating Conservation

Area regulations or state and federal laws. Poaching has been a long-term problem because deer and elk frequently use Pine Creek floodplains at night. Oregon State Police Fish and Wildlife Division, and Conservation Area staff, patrol the highway. The highway corridor is also a frequent source of litter.

## B. Wheeler County Roads

### 1. Clarno Road

Clarno Road crosses Pine Creek approximately 0.3 miles above its confluence with the John Day River. The county road follows the east bank of the river upstream for approximately 5 miles before reaching a locked gate on private land. This road is the access route for several residences, and is used by boaters and fishermen to access the John Day, and public hikers and hunters to access the Spring Basin BLM Wilderness Study Area. The Wheeler County Road Department maintains the graded dirt surface.

Clarno Road passes through only approximately 0.2 miles of Pine Creek Conservation Area property, and its direct impacts are minor. The Tribes and Wheeler SWCD replaced an undersized culvert with a 12 foot wide bottomless arch structure in 2003.

### 2. Pine Creek Road

Pine Creek Road follows the north side of Pine Creek upstream from Highway 218 at Lone Pine Creek. The road follows Pine Creek for several miles and joins Cottonwood Road, another county road that rejoins Highway 218 close to Fossil. This route provides access to several private ranches that occupy the upper Pine Creek watershed. The Wheeler County Road Department maintains the graded dirt and gravel surface.

Pine Creek road follows the boundary of Pine Creek Conservation Area property for approximately 0.4 mile, and constrains the stream channel at one point in this section. The dirt and gravel surface presumably contributes some sediment to the stream during precipitation events. Lone Pine Creek passes through a culvert under Pine Creek Road.

## C. Conservation Area Roads

### 1. Current Conditions

Numerous road tracks exist on the property, yet none are engineered to withstand frequent vehicle use, and most are not likely to withstand high precipitation events. Interior roads have been created either by long-term use by trucks, or by driving a dozer either for road-building purposes or to create a fire break.

In no case is an interior road on Pine Creek Conservation Area engineered with culverts, drive-able dips, or other drainage structures. All interior roads are surfaced with local dirt, clay, or rock. In most areas where roads are on fairly level terrain the surface is in fair condition. Where gradients increase, erosion has carved gullies into the road surface.

## 2. Impacts

The impacts of extensive vehicle use and road construction on Pine Creek Conservation Area are significant. Through soil disturbance and seed transport, ranch roads have served as dispersal routes for noxious weeds. Nearly all the noxious weed infestations away from the Pine Creek floodplain are located along and in ranch roads, which are often vegetated with cheatgrass and medusahead. Ranch roads are also contributing to soil erosion, and contributing sediments to riparian systems. Impacts of ranch roads increase with continued use, especially during wet conditions.

## 3. Easement Routes

Negotiated easements with neighboring landowners require the Tribes to allow vehicle access to several road segments. Vehicle access is allowed to Knox Ranch via the Cove Creek Road, as specified in the easement. Vehicle access on the Cove Creek Road is also allowed to Jim Hubbard and Chet Parker, owners of 40 acres along Cove Creek Road in the SE ¼ SE ¼ of T7SR19E Sec. 25. This easement also allows the Tribes access through Hubbard and Parker's property on the Cove Creek Rd.

## 4. Management Access Routes

Although the impacts of roads are substantial, the difficult topography and risk of wildfires demand that a few routes are kept available for management and fire-fighting purposes. Motor vehicle use on all conservation area roads will be for management purposes only, and will be limited to periods when road surfaces are either dry or frozen to minimize impacts. ATVs will be used in preference to trucks to reduce impacts. Equestrian use is similarly limited to management purposes, with the exception of use by permitted big game hunters.

The following routes are proposed as management access routes, and shown on Figure 1:

i. Cove Creek Road: Highway 218 to Knox Ranch boundary
ii. Jennies Peak Road: Highway 218 at Robinson Canyon to John Day River
iii. Rhodes Canyon Road: Jennies Peak Road to Conservation Area boundary (ATV only)
iv. Divide Route: Highway 218 to Rhodes Canyon Road (ATV only)
v. Rattlesnake Canyon Road: Jennies Peak Road to Conservation Area boundary
vi. Left Hand Canyon Road: Jennies Peak Road to Conservation Area boundary

These routes may require erosion control and maintenance activities. When ground-disturbing activities are necessary, they will be subject to cultural resources review.

## 5. Closed Routes

All interior roads not Easement Routes or Management Access Routes will be closed to all motor vehicle traffic. If deemed necessary for rehabilitation, roads will be ripped or reshaped with a hydraulic excavator and seeded with a native bunchgrass mixture.

# XVIII. FIRE MANAGEMENT

## A. Historic Role of Fire in Rangelands

Fire is a natural factor on wildlands, and probably no range site with its associated plant community has developed without being influenced by fire (Vallentine, 1989). Fire likely occurred on the property when fuel accumulation and weather conditions made ignition and burning possible. Years with abundant winter and spring rains that allowed plant growth to flourish, followed by dry summer and fall conditions, likely produced the largest fires. The frequency of fire prevented the encroachment of juniper into grassland and sagebrush areas and restricted its range to rocky outcrops or slopes with thin soils that lacked the understory vegetation to carry fire. (See uplands section for more information on the spread of juniper).

Burning by native people likely also played a role in the fire history of the property. Deliberate burning was used in the Blue Mountains to increase visibility of game animals, to drive game animals, and to attract game animals after the burning by vegetative resprouting. It was also used to encourage the growth of food plants (Vallentine, 1989).

Plant species vary dramatically in their response to fire, with some capable of surviving fires, others capable of root-sprouting, and others dependent on regeneration from seed. In general, grasses and forbs are favored by fire and shrubs and trees decline following fire. This is due to the different physical characteristics of the species as well as the timing of the fire. Most prescribed fires do not affect forbs because forbs complete their life cycle prior to the time of year appropriate for burning. Grasses have many physiological adaptations that allow them to survive and thrive following a burn.

The vegetation on Pine Creek suggests a fire-free interval of 15 to 25 years, this has now either been extended to over 100 years in the areas dominated by juniper or has decreased to less than 10 years and allowed the proliferation of medusahead and cheatgrass. The historic fire regime has been altered by land management practices. The intensity, size, frequency, severity, season, and pattern of burning have all been altered by overgrazing and fire suppression (Eddleman, 2000). A secondary effect of the changes in fire regime is the reduction of fine fuel loads (due to the expansion of juniper and overgrazing) limiting the potential of occurrence of all but the most severe fires (Riggs, et. al, 1996). The wild fire response plan will relate control methods to fire intensity, as well as delineating potential firebreaks.

## B. Fire Management Partners

The Bureau of Land Management, and Central Oregon Interagency Dispatch, are the primary wild fire response agencies in the Pine Creek Conservation Area area. Only 160 acres of Conservation Area property in T8SR21E, Sec. 21, falls within an Oregon Department of Forestry fire protection district.

The Tribes requested a meeting with BPA on fire issues, which was held on February 25, 2003 at BPA in Portland. The meeting purpose was to discuss fire management issues related to CTWS

managed mitigation properties, inform BPA management of potential fire management costs, and develop a strategy for controlling costs associated with fire management, including financial liability and affected resources.

## C. Fire Management Plan

A wildfire response plan will be developed in cooperation with fire management personnel. This plan will take into consideration the concerns of neighboring landowners as well as the management needs of the Conservation Area.

The wildfire response plan will specify that suppressing wildfire should be accomplished in a manner least damaging to wildlife habitats, plant communities, streams, roads, and other resources, and when possible wild fires should be allowed to burn out to natural firebreaks. The wildfire response plan will further specify that only in emergency situations will heavy machinery be used and vehicles including ATV's taken off management access routes.

## D. Prescribed Fire

Prescription fire will be used as a vegetation management tool on the Conservation Area. Prescribed fire as a management option is discussed under Juniper Management in the Upland Habitats Section. The Tribes are currently working with the Prineville District BLM to plan two prescription fires on the Conservation Area.

# XIX. TRIBAL AND PUBLIC ACCESS

## A. Memorandum of Agreement

The Memorandum of Agreement between BPA and the Tribes specifies that:

> "The public shall have reasonable access to the Project. The Tribe may regulate access, provided that access and transportation regulations shall apply equally to tribal members and non-tribal members. The Tribe will not provide public access or use that will result in adverse impacts to wildlife, the reduction of wildlife habitat values, or the destruction of other natural resource values for which the Properties are managed, or impede the increase in HEP value of improvement HUs. Nothing in this Agreement limits the authority or ability of the Tribe to manage the properties for public safety and wildlife habitat conservation, or to preserve and protect cultural, historic, and religious sites, and to carry out and protect the federally guaranteed rights of the Tribe and its members. Nothing in this agreement limits or diminishes any treaty retained right or privilege of the Tribe or its members afforded under federal law as a result of the status of the Tribe or Tribal members, provided that treaty reserved rights will be exercised consistent with this Agreement." (MOA, Section 14)

## B. Access Regulations

The Tribes have created Access Regulations with the assistance of the Pine Creek Conservation Area Access Advisory Committee. The committee will continue to meet yearly to review the Access Management Plan and to agree upon regulations. The committee is composed of representatives from the following groups:

The Confederated Tribes of Warm Springs
Oregon Department of Fish and Wildlife
Bureau of Land Management
National Park Service
Oregon Museum of Science and Industry
Oregon State Police, Fish and Wildlife Division
Wheeler County landowners

Current access regulations are attached as Appendix D.

## XX. LAND EXCHANGE

The irregular shape of Pine Creek Conservation Area and neighboring public lands managed by the Prineville District BLM, and the multiple isolated parcels of public land within the Conservation Area, create a situation in which a land exchange between the Tribes and the BLM would benefit management of both Pine Creek Conservation Area and the public lands. The land exchange would also result in immediate and long-term savings in operations and maintenance expenses.

The Tribes are currently working with the BLM on an equal-value land exchange proposal. The Oregon Natural Desert Association (ONDA) has assisted with developing the exchange proposal. Through the land exchange, the Tribes would:

- Consolidate the Tribes' Conservation Area property into a cohesive unit, greatly facilitating management.

- Significantly reduce the length of boundary between the Conservation Area and public lands, leading to immediate and long-term savings in fencing and management costs. (The total length of boundary between the Tribes' Conservation Area and BLM properties would reduce by approximately 40 miles).

- Acquire all BLM inholdings within the Tribes' Conservation Area. The BLM would acquire the Tribes' inholding within the BLM Spring Basin Wilderness Study Area.

- Acquire habitats of equal value to those exchanged to the BLM. Exchange riverfront property with no net loss of riverfront mileage to either the Tribes or the BLM.

The Tribes believe that this exchange would also benefit management of, and access to, public lands outside of the Conservation Area. All public lands associated with the Conservation Area would be accessible, from a public road and/or the John Day River, after the land exchange with the Tribes.

The Tribes' hold the grazing preference on all BLM land which they would acquire, and would similarly retain grazing preference on all parcels acquired by the BLM from the Tribes.

The Tribes discussed this potential exchange with BPA Fish & Wildlife staff in a meeting on February 25, 2003. Prior to completing a land exchange, the Tribes will obtain concurrence from BPA Fish and Wildlife Division Director, and will follow all the relevant sections of the MOA. This plan will be amended after completion of the land exchange in order to reflect new boundaries and incorporate the acquired parcels.

# XXI. MONITORING AND EVALUATION

Monitoring is a vital component of any restoration program. In order to confidently assess the effectiveness of any treatment, it is necessary to know the antecedent conditions, keep records of treatments, and record post treatment results. While some records exist from projects on Pine Creek prior to acquisition of the Conservation Area by the Tribes, a detailed record of conditions prior to overall project initiation does not exist. Interpretations of the causes of future changes will be limited by this lack of pre-treatment data.

Pine Creek Conservation Area has the potential to serve as a model for watershed recovery in the lower John Day basin. There is a widely acknowledged need for long-term, small watershed studies to provide reference data for other short-term studies and to guide future watershed restoration efforts (Hawkins, 1986; Miller, et al., 1987; Schmidt, 1986). To maximize the value of watershed recovery on the Conservation Area, it is critical to record baseline conditions as soon as possible and monitor changes through time.

In an ideal experimental design, a set of treatment areas would be paired with a similar set of control study areas. In watershed studies, this is generally not possible due to geographic and logistical constraints. A common compromise approach is a paired design, with one treatment and one control area. The paired area should approximate the geology, soils, vegetation, and stream flow to the extent possible.

While there are no watersheds identical to Pine Creek, nearby tributaries of the lower John Day may prove useful for future comparisons. The BLM is currently monitoring Bridge Creek as part of the Sutton Mountain Coordinated Resource Management Plan. Butte Creek and Thirty Mile Creek are other options for comparison. These watersheds face different impacts and restoration projects than Pine Creek.

The Oregon Department of Environmental Quality (DEQ) initiated a biomonitoring program in the John Day Basin in 2000. DEQ will be sampling water quality and macroinvertebrates in randomly selected stream reaches throughout the basin, and will also sample selected reference reaches. Pine Creek may serve as a useful reference reach for the DEQ project, while conversely, the sampling of randomly selected stream reaches through the basin may provide an excellent reference for changes in Pine Creek.

## A. Habitat Evaluation Procedure (HEP)

As a BPA Wildlife Habitat Mitigation site, Pine Creek Conservation Area is obligated to conduct a Habitat Evaluations Procedure (HEP) survey of wildlife habitats on the property. HEP procedures are intended to document the availability of habitats that were impacted by the construction of John Day Dam on the Columbia. The purchase of Pine Creek Conservation Area will provide BPA with mitigation credits for the amount of appropriate habitat that occurs on the property.

HEP is a procedure for measuring the quality and quantity of habitat by using models of habitat suitability for selected indicator species. A baseline HEP measurement took place on the Pine Creek Ranch acquisition in 2001. This baseline measurement determines the minimum mitigation credit BPA will receive for funding the project.

The MOA states, in Section 4. b. ii., that "If the Project involves major habitat improvement activities, such as revegetation, mechanical manipulation or other large scale land use modifications, HEP sampling should occur seven to ten years following completion of the improvement activities." The Pine Creek Conservation Area acquisition involves a clear large scale land use modification (from grazing as the primary land use to wildlife habitat management. The ongoing management of the property also involves large scale projects such as prescription fires. However, there is no "completion" of the habitat improvement activities, as management is ongoing. The Tribes have agreed with BPA to conduct the first follow-up HEP for the entire Conservation Area in 2010, and subsequent HEPs every ten years, or as often as the Tribes and BPA agree. The 2010 scheduled follow up HEP would be 5 years after prescription fires scheduled for 2004 and 2005 are completed, 10 years after habitat management was initiated on the Pine Creek acquisition, and 8 years after management changes were initiated on the Wagner acquisition. This HEP may result in BPA receiving additional credit, if habitat improvements have occurred, and in the proportion of project funding that has been provided by BPA. All mitigation credit received by BPA will be in accordance with the MOA between BPA and the Tribes.

Field work for the baseline HEP on the original Pine Creek Ranch purchase was conducted in April, 2001. The summary report is attached as Appendix E. A total of 14,057 Habitat Units were estimated in the baseline HEP.

A baseline HEP on the Wagner Ranch portion of the project was conducted in 2003, and estimated 5,553 Habitat Units were protected on the Wagner Ranch acquisition. The summary report is attached as Appendix F.

## B. Riparian Monitoring

Riparian Monitoring strategies will vary between the John Day River, Pine Creek, and other tributary drainages (Table 7).

**Table 7. Riparian Monitoring Plan.**

| | Cost-share | Method | Sites | Freq. | Cost* |
|---|---|---|---|---|---|
| 1. Stream flow** | USGS (50%) | Telemetered data-logging gage | PC (1) | Continual | 5,510 annual |
| 2. Water Temperature | USGS (50%) | Telemetered data-logging probe | PC (1) | Continual | 3,140 annual |
| 3. Water Quality | DEQ (100%) | Field Chemistry | PC (6) | 2001 & 2002; repeat 10-20 years | None for completed work, unknown |
| 4. Macro-invertebrates | DEQ (100%) | Laboratory ID | PC (6) | | |

| | | | | | |
|---|---|---|---|---|---|
| 5. Habitat conditions Channel & Vegetation | DEQ (100%) | DEQ Habitat Monitoring | PC (6) | | for future |
| 5. Habitat conditions Channel & Vegetation | ODFW | Modified Hankin & Reeves | JDR (10 miles) | 10-20 years | 10,000 |
| 6. Steelhead Spawning | ODFW (in-kind) | Redd Surveys | PC (3 miles) | Annual | 200 |
| 7. Beaver Activity | OMSI (in-kind) | GPS & measure dams | PC (length within Conservation Area) | As needed | 200 |
| 8. Photomonitoring | None | Digital photo from marked locations | JDR &Trib.s PC & Trib.s | Annual | 1,000 |
| 9. Breeding Birds | None | Point counts | JDR &Trib.s PC & Trib.s | Annual | 1,000 |
| 10. Vegetation Mapping | BLM, NPS, ONHIC | 0.5m color digital orthophotography | Entire Property | 10-20 years | ? (part of complete coverage) |
| 11. Vegetation Composition | None | Transect sampling | PC (30) | 10-20 years | 5,000 |

* Cost to Tribes after cost-share, all costs are approximate.
** Streamflow data will be provided to BPA annually in conjunction with annual reports, including explanation and analysis of the data.

## C. Wildlife Monitoring

Ground or aerial surveys of big game will be conducted annually in winter to enable estimation of age and sex ratios for mule deer and elk (Table 8). Long-term trends in age and sex ratios will inform harvest decisions. All hunter harvests will be recorded.

Point count surveys of breeding birds will be conducted at riparian and upland monitoring points during breeding seasons. These surveys will be repeated to assess long-term changes in breeding bird communities. The habitat manager will maintain a list of weekly bird observations.

**Table 8. Wildlife Monitoring Plan**

| Survey | Cost-share | Method | # of Sites | Freq. | Cost |
|---|---|---|---|---|---|
| Winter Game Survey | CTWRSO | Aerial or ground | Entire property | Annual | 2,000 |
| Breeding Birds | None | Point Counts | 28 Upland | Annual | 2,000 |

## D. Vegetation Monitoring

Vegetation will be monitored at multiple scales (Table 7). GIS personnel have classified vegetative cover using Landsat scenes obtained in 2000. This vegetation cover type information is stored within the Tribes' GIS database. This coverage has been used to generate sampling

points and calculate habitat areas for the Pine Creek Ranch baseline HEP. This coverage is limited to distinctions between broad cover types such as juniper (varying densities), and grassland, and does not make distinctions between shrub steppe communities or timbered areas.

In 2002, the Tribes will undertake a cooperative aerial photography and vegetation mapping project with BLM, NPS, and the OR NHP. This project will cover an area including Pine Creek Conservation Area, John Day Fossil Beds National Monument Clarno and Painted Hills Units, and BLM lands in the Spring Basin WSA, Amine Peak Allotment, and Sutton Mountain and Pats Cabin WSAs, as well as approximately 25 miles of the John Day River. Aerial flights will be used to generate 0.5 meter pixel color digital orthophotography and an associated digital terrain model (DTM).

The Oregon Natural Heritage Information Center will use the imagery and field plots to classify Conservation Area vegetation according to the US National Vegetation Classification. Field plots will be permanently marked on the ground, and will be used to investigate species composition of vegetation types identified on the aerial imagery.

Satellite images will be used to track vegetative changes on the property over time, with repeat sampling of field plots as needed. Images will be obtained in 2010 and every 5 years thereafter. The documentation of changes in juniper cover will be shared with BPA every 5 years.

## E. Weather Monitoring

A meteorological station has been installed in conjunction with the USGS streamflow gauge on Pine Creek. The weather station includes instruments for monitoring air temperature, precipitation, solar radiation, and wind speed and direction. All data will be logged, and precipitation data will be reviewed and published by the USGS. Annual operating and maintenance cost for the weather station, including data review and publication, is approximately $4,640.

## F. Project Monitoring

All management actions that are likely to impact soils, vegetation, or wildlife will be accompanied by photomonitoring. Additional monitoring will be conducted as appropriate.

## G. Management Research

The Tribes will seek to accomplish research as needed to inform management decisions, and will make the results of research and monitoring available to other researchers and land managers. When appropriate, research results will be published in peer-reviewed journals.

## H. Independent Research

The Tribes encourage research in conservation related sciences. Priority research projects on Pine Creek Conservation Area will have the potential to guide future management of the property. Direct investigations of alternate management techniques will be highly useful. Basic

ecological research is also encouraged, especially research with the potential to increase understanding of natural communities.

**Research Guidelines**

1. All research projects must be approved by Conservation Area management.
2. It is suggested that researchers confer with Conservation Area personnel prior to proposing on-site research projects.
3. All projects must be compatible with management objectives and activities.
4. During initial project evaluation, suggestions may be made for either minimizing impacts or integrating research with other programs (management, education).
5. During initial project evaluation, decisions will be made as to the permanence of study plots or markings. All materials not designated as permanent will be removed by the researchers.
6. Collection of specimens will be allowed by permit only, and will follow guidelines.
7. Approved researchers will coordinate research activities with Pine Creek Conservation Area staff, and will abide by rules and regulations.
8. Researchers must submit annual reports, final reports by the completion date, and copies of any relevant publications. Researchers are expected to provide a reasonable amount of consultation with Pine Creek Conservation Area on the implications of their work. The Tribes will provide copies of these reports to BPA.

## I. Monitoring Reports

The Tribes will maintain monitoring data and reports from individual monitoring projects. Every 5 years, beginning in 2006, the Tribes will prepare a monitoring report that will be provided to BPA and partner agencies. The report will describe monitoring activities over the previous 5 years, summarize the results of all monitoring work, and interpret ecological changes observed.

# XXII. MANAGEMENT ACTIONS

Currently planned management actions are summarized in Table 9. As noted in the introductory sections, knowledge of Conservation Area resources, and restoration and management strategies, will continue to increase through monitoring and evaluation. Additional management actions not identified in this plan will likely be necessary, and will be permitted providing they are compatible with guidelines set forth within this document.

**Table 9. Management Strategies, Tasks, Relevant Objectives, and Timelines.**

| Management Strategy | Task | Description | Objectives Addressed | Duration in FYs |
|---|---|---|---|---|
| Monitoring and Evaluation of Physical and Biological Conditions | | Monitoring and Evaluation Strategies are described in Section XXI of this plan, and are not repeated here. | 24 | Ongoing |
| **Management Strategy** | **Task** | **Description** | **Objectives Addressed** | **Duration in FYs** |
| Complete and Implement Management Plans | Adopt Wildlife Habitat and Watershed Management Plan | | All | FY04 |
| | Complete Weed Management Plan | Identify priority species of concern and control strategies. Append Weed Management Plan to Wildlife Habitat and Watershed Management Plan. | 1, 2, 3, 5, 6, 7, 9, 14, 15, 19 | |
| | Complete Fire Management Plan | Reach wildfire control responsibility agreement with BPA and BLM. | 1, 2, 3, 4, 9, 20, 21 | FY03-FY04 |
| | | Complete Fire Management Plan, including provisions for response to wildfire and use of prescription fire. Append Fire Management Plan to Wildlife Habitat and Watershed Management Plan. | 1, 2, 3, 4, 9, 20, 21 | FY03-FY04 |

| | | | | |
|---|---|---|---|---|
| | Revise Access Regulations as needed. | Continue to work with Access Advisory Committee on an annual basis. | 9, 10, 14, 15, 22 | Ongoing (Annual) |
| **Management Strategy** | **Task** | **Description** | **Objectives Addressed** | **Duration in FYs** |
| Maintain and facilitate recovery of watersheds and habitats. | Treat noxious weeds. | Use mechanical, chemical, and biological control as appropriate. | 1, 2, 3, 5, 6, 7, 9, 14, 15, 19 | Ongoing |
| | Restore native vegetation in disturbed riparian and floodplain areas. | Propagate native plant stock as needed. Implement CREP Riparian Buffer project on Pine Creek. Plan and implement riparian buffer plantings on Wagner Ranch. | 5, 6, 7, 9, 10, 14, 15 | Ongoing |
| | Mechanically control juniper for watershed and habitat benefit. | Chainsaw girdle and/or fell trees in areas of groundwater availability. Do not cut trees with old growth characteristics, nests, or nest cavities. | 1, 2, 3, 4, 5, 6, 9, 20, 21 | Ongoing |
| | Utilize prescribed fire to manage upland habitats. | Plan and conduct prescription fires in areas with young juniper encroaching into sagebrush and bunchgrass vegetation. Coordinate and communicate closely with neighboring landowners. | 1, 2, 3, 4, 9, 20, 21 | Ongoing |
| | Eliminate Fish-passage barrier culverts on Pine Creek. | Remove culvert at trailer driveway. Install rock weirs and juniper rootwads as needed for erosion control. | 6, 8, 10, 11 | Completed in FY02 |
| | | Replace culvert at Clarno Rd with an appropriately sized and placed bottomless arch structure. | 6, 8, 10, 11 | Completed in FY03 |
| | | Replace culvert at Robinson Canyon with an appropriately sized and placed bottomless arch structure. | 6, 8, 10, 11 | FY04 if funding adequate |
| | Reduce incidence of trespass livestock. | Monitor for livestock, work with neighbors to reduce trespass problems. | 16, 17 | Ongoing |
| | | Provide River Valley Farms 50% cost-share for construction of fence on new boundary after mutual land exchange | 16, 17 | FY03 |

| | | | | |
|---|---|---|---|---|
| | Reduce erosion caused by management roads. | Install drainage dips as needed to maintain road and reduce erosion on 20 miles of Jennies Peak Rd. | 5, 6, 10 | FY04 or FY05 if funding adequate |
| | | Rehabilitate closed roads, including obstructing with felled juniper and re-seeding as necessary. | 1, 2, 3, 5, 6, 7, 9, 10, 14, 15, 19 | FY05 |
| | Return all water rights to permanent instream rights. | Utilize Pine Creek and John Day River water rights as needed on a temporary basis to support restoration plantings. Complete permanent instream lease of all water rights by 2012. | 5, 6, 7, 8, 9, 10 | 10 |
| | Achieve mutual land exchange with BLM | Consolidate Conservation Area habitat and facilitate management. | 14, 15, 16, 17, 18, 19, 22, 23 | Until completed |
| | Maintain Conservation Area facilities. | Maintain buildings and property used to achieve management objectives. | All | Ongoing |
| Maintain public support for watershed and wildlife habitat conservation. | Continue implementation of tribal and public access program. | Maintain informational signs and posted boundaries; provide informational brochures, maps, and regulations. | 22 | Ongoing |
| | | Patrol Conservation Area property and work with OSP to reduce poaching and trespass incidents. | 22 | Ongoing |
| | Support natural history and conservation education. | Work with local education groups and communicate the goals of the Tribes and BPA. | 22, 25 | Ongoing |
| | Assist with local watershed and habitat projects. | Work cooperatively with Wheeler SWCD and other agencies supporting watershed and wildlife projects in the local area | All | Ongoing |

* Cost to Tribes after cost-share, all costs are approximate.

# XXIII. BUDGET

The MOA between the Tribes and BPA states:

> The purpose of this Agreement is to provide a mechanism for BPA to fund, and the Tribe to implement, the protection, mitigation, and enhancement of wildlife habitat permanently to help fulfill BPA's duties under the Northwest Power Act. (RECITALS, G.)

And further states :

> BPA shall also provide a reasonable amount of additional funds for operation and maintenance to help the Tribe ensure the habitat's natural characteristics and mitigation qualities are developed and self-sustaining. The parties expect those amounts to include allowances for items and activities such as vehicle acquisition, building maintenance, Project management, noxious weed treatment, and habitat evaluation. All operations and maintenance funding will be subject to a yearly prioritization process administered by the Council, its assigns or successors. By January 30, 2002, the parties shall make their best efforts to negotiate a long-term operation and maintenance funding plan for payment on an annual basis, through establishment of a trust fund, or by any other means agreed to by the parties. Until such time that a long term agreement is reached, operations and maintenance will continue to be subject to the annual prioritization process. (AGREEMENT, 1. BPA Obligations (c)).

As of October 2003, BPA and the Tribes have not reached a long-term funding agreement.

The Tribes management of Pine Creek Conservation Area was negatively affected by BPA's process of imposing a new accrual-based budget process, in part due to invoicing the majority of 2002 obligated funds during the calendar period of FY2003.

The Tribes have requested FY04 and FY05 O&M funding from BPA at NPCC Provincial Meetings in 2003. The FY04 budget request was $351,405, and the FY05 budget request was $325,206.

At the start of FY2004, the Tribes have a budget with BPA of $127,500 for Operations and Maintenance of Pine Creek Conservation Area. This amount is reduced below the original out-year funding estimate of $152,250, due to expenses of $24,750 incurred in FY2003 and charged against the FY2004 funding level. The current FY2004 Statement of Work is attached as Appendix G.

Current and future funding uncertainty limits the accuracy of budget projections. The Tribes have identified major operations and maintenance projects necessary to meet their goals for the Conservation Area. O&M Funding to achieve these objectives was included in the FY2004 and FY2005 budget estimates presented to the NPCC, and will be sought through NPCC Provincial Review processes. For FY2004, $40,000 was sought for a fish passage culvert replacement

project, and $110,000 for erosion control and maintenance on Conservation Area roadways. For FY2005, $145,000 was sought for a 5800-acre prescription fire for juniper control.

In the meantime, the Tribes have calculated a baseline Pine Creek Conservation Area O&M budget that does not include major project expenses (Table 10). This budget also does not account for potential future cost increases or inflation.

**Table 10. Annual Baseline Budget Estimate.**

| Category & Line Item | | | | | Subtotals |
|---|---|---|---|---|---|
| **1. Personnel:** | | | | | |
| Title: | Months | Monthly | Subtotal | Fringe (23%) | |
| Habitat Manager | 12 | $2,661 | $31,930 | $7,344 | |
| GIS Specialist | 1 | $3,597 | $3,597 | $827 | |
| Fish & Wildlife Manager | 1 | $4,593 | $4,593 | $1,056 | |
| Seasonal Assistant | 3 | $2,000 | $6,000 | $1,380 | |
| | | | | Personnel: | $56,728 |
| **2. Travel:** | | | | | |
| BPA/NPCC Meeting or Conference travel | | | $500 | | |
| | | | | Travel: | $500 |
| **3. Vehicle** | | | | | |
| GSA Lease Pickup | 12 | 248.5 | $2,982 | | |
| Mileage (cost per mile) | 10,000 | 0.185 | $1,850 | | |
| Insurance (GSA Truck) | 12 | 124.08 | $1,489 | | |
| Insurance (ATV) | 12 | 36.08 | $433 | | |
| | | | | Vehicle: | $6,754 |
| **4. Supplies & Equipment (Expense Items)** | | | | | |
| Office Supplies/Equipment | | | | | |
| office supplies | | | $500 | | |
| postage | | | $350 | | |
| printing / copying | | | $750 | | |
| Field/Research Supplies/Equipment | | | | | |
| Non-office supplies | | | $7,500 | | |
| Minor equipment and Tools | | | $1,100 | | |
| Major Equipment | | | $800 | | |
| Equipment Maint./Repair | | | $350 | | |
| Automotive fuel | | | $900 | | |
| Equipment fuels | | | $400 | | |
| | | | | Supplies/Equipment: | $12,650 |

| Category & Line Item | | | | | Subtotals |
|---|---|---|---|---|---|
| **5. Rent / Utilities** | | | | | |
| Electricity | | | $2,500 | | |
| Sanitation | | | $500 | | |
| Building maintenance | | | $350 | | |
| Buildings Insurance | 12 | $50 | $600 | | |
| Telephone & Internet | | | $2,500 | | |
| | | | | Rent/Utilities: | $6,450 |
| **6. Other fees** | | | | | |
| Legal fees | | | $3,500 | | |
| | | | | Other Fees: | $3,500 |
| **7. Capital Equipment** | | | | | |
| | | | | Capital Equipment: | $0 |
| **8. Sub-contracts** | | | | | |
| Streamgage & weather station cost-share with USGS | | | | $12,870 | |
| Helicopter- game survey | | | | $2,200 | |
| Noxious Weed Control | | | | $15,000 | |
| Rotating Annual Project Fund* | | | | $30,000 | |
| * Rotating Annual Project Fund is a placeholder for specific management projects that will vary from year to year. Examples could include restoration plantings, road maintenance, juniper control, etc… Major projects will require additional funds. | | | | | |
| | | | | Subcontracts: | $60,070 |
| **9. Indirect** | | Rate | Subtotal | | |
| Percentage Applied to Items 1-6 | | 37.70% | $86,582 | | $32,641 |
| | | | | | |
| | | | **BASELINE TOTAL:** | | **$179,293** |

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## APPENDIX A. TERRESTRIAL VERTEBRATE WILDLIFE SPECIES LIST.

October 2003
Taxonomic listings, Status and Rank information, and species listed as expected are drawn from Csuti, et al., 1997.
Past observations are from Natural Heritage Program data or a "Pine Creek Watershed Restoration Project" report dated 9/19/97.
Heritage Rankings: G (Global), S (State), followed by: 1 (critically imperiled), 2 (imperiled), 3 (vulnerable to extirpation or extinction), 4 (apparently secure), 5 (demonstrably widespread, abundant, and secure), or E (Exotic); Entries in *italics* denote introduced species.

| | | | | | | Observed? | | | Status | | Rank | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Order | Family | Genus | species | Common name | 2000-2003 | Past | Exp. | State | Federal | Global | State |
| **AMPHIBIANS:** | | | | | | | | | | | | |
| 1 | Caudata | Ambystomatidae | Ambystoma | macrodactylum | LONG-TOED SALAMANDER | x | | | | | G5 | S5 |
| 2 | Anura | Bufonidae | Bufo | boreas | WESTERN TOAD | x | | | Sensitive | | G4 | S4 |
| 3 | | Hylidae | Pseudacris | regilla | PACIFIC CHORUS FROG | x | | | | | G5 | S5 |
| 4 | | Pleobatidae | Scaphiopus | intermontanus | GREAT BASIN SPADEFOOT | | | x | | | G5 | S5 |
| 5 | | *Ranidae* | *Rana* | *catesbeiana* | *BULLFROG* | x | | | | | G5 | S5 |
| 6 | | | Rana | pretiosa | SPOTTED FROG | | | ? | Sensitive | C | G3G4 | S2 |
| **REPTILES:** | | | | | | | | | | | | |
| 1 | Squamata | Anguidae | Elgaria | multicarinata | SOUTHERN ALLIGATOR LIZARD | x | | | | | G5 | S5 |
| 2 | | Iguanidae | Phrynosoma | douglasii | SHORT-HORNED LIZARD | | | x | | | G5 | S4? |
| 3 | | | Sceloporus | graciosus | SAGEBRUSH LIZARD | | | x | | SC | G5 | S5 |
| 4 | | | Sceloporus | occidentalis | WESTERN FENCE LIZARD | x | | | | | G5 | S5 |
| 5 | | | Uta | stansburiana | SIDE-BLOTCHED LIZARD | | | x | | | G5 | S5 |
| 6 | | Scincidae | Eumeces | skiltonianus | WESTERN SKINK | x | | | | | G5 | S5 |
| 7 | | Boidae | Charina | bottae | RUBBER BOA | | | x | | | G5 | S4 |
| 8 | | Colubridae | Coluber | constrictor | RACER | x | | | | | G5 | S4? |
| 9 | | | Hypsiglena | torquata | NIGHT SNAKE | x | | | | | G5 | S3 |
| 10 | | | Masticophis | taeniatus | STRIPED WHIPSNAKE | x | | | | | G5 | S4 |
| 11 | | | Pituophis | melanoleucus | GOPHER SNAKE | x | | | | | G5 | S5 |
| 12 | | | Thamnophis | elegans | W. TERRESTRIAL GARTER SNAKE | x | | | | | G5 | S5 |
| 13 | | | Thamnophis | sirtalis | COMMON GARTER SNAKE | x | | | | | G5 | S5 |
| 14 | | Viperidae | Crotalus | viridis | WESTERN RATTLESNAKE | x | | | | | G5 | S4 |
| **BIRDS:** | | | | | | | | | | | | |
| 1 | Podicipediformes | Podicipedidae | Podilymbus | podiceps | PIED-BILLED GREBE | x | | | | | G5 | S5 |
| 2 | | Ciconiformes | Ardea | herodias | GREAT BLUE HERON | x | | | | | G5 | S4 |
| 3 | | | Nycticorax | nycticorax | BLACK-CROWNED NIGHT-HERON | | | ? | | | G5 | S4 |
| 4 | Anseriformes | Anatidae | Cygnus | columbianus | TUNDRA SWAN | x | | | | | G5 | S4 |
| 5 | | | Branta | canadensis | CANADA GOOSE | x | | | | | G5 | S5 |
| 6 | | | Aix | sponsa | WOOD DUCK | x | | | | | G5 | S4 |
| 7 | | | Anas | crecca | GREEN-WINGED TEAL | x | | | | | G5 | S5 |
| 8 | | | Anas | platyrhyncos | MALLARD | x | | | | | G5 | S5 |
| 9 | | | Anas | discors | BLUE-WINGED TEAL | x | | | | | G5 | S4 |
| 10 | | | Anas | cyanoptera | CINNAMON TEAL | | x | | | | G5 | S5 |
| 11 | | | Aythya | collaris | RING-NECKED DUCK | x | | | | | G5 | S5 |

# Appendix A: Terrestrial Vertebrate Wildlife Species List

| | | | | | | Observed? | | | Status | | Rank | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Order | Family | Genus | species | Common name | 2000-2003 | Past | Exp. | State | Federal | Global | State |
| 12 | | | Aythya | affinis | LESSER SCAUP | x | | | | | G5 | S3 |
| 13 | | | Bucephela | clangula | COMMON GOLDENEYE | x | | | | | G5 | S4 |
| 14 | | | Bucephela | albeola | BUFFLEHEAD | x | | | | | G5 | S2B,S5N |
| 15 | | | Oxyura | jamaicensis | RUDDY DUCK | x | | | | | G5 | S4 |
| 16 | | | Anas | strepera | GADWALL | x | | | | | G5 | S5 |
| 17 | | | Mergus | merganser | COMMON MERGANSER | x | | | | | G5 | S4 |
| 18 | | | Lophodytes | cucullatus | HOODED MERGANSER | x | | | | | G5 | S4 |
| 19 | Falconiformes | Cathartidae | Cathartes | aura | TURKEY VULTURE | x | | | | | G5 | S5 |
| 20 | | Accipitridae | Pandion | haliaetus | OSPREY | x | | | | | G5 | S4 |
| 21 | | | Circus | cyaneus | NORTHERN HARRIER | x | | | | | G5 | S5 |
| 22 | | | Accipiter | striatus | SHARP-SHINNED HAWK | x | | | | | G5 | S4 |
| 23 | | | Accipiter | cooperii | COOPER'S HAWK | x | | | | | G4 | S4 |
| 24 | | | Accipiter | gentilis | NORTHERN GOSHAWK | x | | | Sensitive | SC | G4 | S3 |
| 25 | | | Buteo | swainsonii | SWAINSON'S HAWK | | x | | Sensitive | | G4 | S3 |
| 26 | | | Buteo | jamaicensis | RED-TAILED HAWK | x | | | | | G5 | S5 |
| 27 | | | Buteo | lagopus | ROUGH-LEGGED HAWK | x | | | | | G5 | |
| 28 | | | Buteo | regalis | FERRUGINOUS HAWK | | | x | Sensitive | SC | G4 | S3 |
| 29 | | | Aquila | chrysaetos | GOLDEN EAGLE | x | | | | | G5 | S4 |
| 30 | | | Haliaeetus | leucocephalus | BALD EAGLE | x | | | Threatened | Threatened | G4 | S3 |
| 31 | | | Falco | sparverius | AMERICAN KESTREL | x | | | | | G5 | S5 |
| 32 | | | Falco | peregrinus | PEREGRINE FALCON | | x | | Endangered | Endangered | G4 | S1 |
| 33 | | | Falco | mexicanus | PRAIRIE FALCON | x | | | | | G4G5 | S4 |
| 34 | | | Falco | columbiarus | MERLIN | x | | | | | G5 | S1B,S3?N |
| 35 | Galliformes | Phasianidae | *Alectoris* | *chukar* | *CHUKAR* | x | | | | | G5 | SE |
| 36 | | | *Phasianus* | *colchicus* | *RING-NECKED PHEASANT* | x | | | | | G5 | SE |
| 37 | | | Dendragapus | obscurus | BLUE GROUSE | | | ? | | | G5 | S4 |
| 38 | | | Bonasa | umbellus | RUFFED GROUSE | x | | | | | G5 | S4? |
| 39 | | | *Meleagris* | *gallopavo* | *WILD TURKEY* | x | | | | | G5 | SE |
| 40 | | Odontophoridae | Callipepla | californica | CALIFORNIA QUAIL | x | | | | | G5 | S4 |
| 41 | | | Oreortyx | pictus | MOUNTAIN QUAIL | x | | | | SC | G5 | S4? |
| 42 | Gruiformes | Rallidae | Rallus | limicola | VIRGINIA RAIL | x | | | | | G5 | S4 |
| 43 | | | Porzana | carolina | SORA | | x | | | | G5 | S4 |
| 44 | | | Fulica | americana | AMERICAN COOT | x | | | | | G5 | S5 |
| 45 | | Gruidae | Grus | canadensis | SANDHILL CRANE | x | | | Sensitive | | G5 | S3 |
| 46 | Charadriiformes | Charadriidae | Charadrius | vociferus | KILLDEER | x | | | | | G5 | S5 |
| 47 | | Scolopacidae | Tringa | melanoleuca | GREATER YELLOWLEGS | x | | | | | G5 | S1 |
| 48 | | | Actitis | macularia | SPOTTED SANDPIPER | x | | | | | G5 | S4 |
| 49 | | | Gallinago | gallinago | COMMON SNIPE | x | | | | | G5 | S4 |
| 50 | Columbiformes | Columbidae | *Columba* | *livia* | *ROCK DOVE* | x | | | | | G5 | SE |
| 51 | | | Zenaida | macroura | MOURNING DOVE | x | | | | | G5 | S5 |
| 52 | Strigiformes | Tytonidae | Tyto | alba | BARN OWL | x | | | | | G5 | G4? |
| 53 | | Strigidae | Otus | flammeolus | FLAMMULATED OWL | | x | | Sensitive | | G4 | S4 |
| 54 | | | Otus | kennicottii | WESTERN SCREECH-OWL | x | | | | | G5 | S4 |
| 55 | | | Bubo | virginianus | GREAT-HORNED OWL | x | | | | | G5 | S5 |
| 56 | | | Glaucidium | gnoma | NORTHERN PYGMY OWL | x | | | Sensitive | | G5 | S4? |
| 57 | | | Athene | cunicularia | BURROWING OWL | | | x | Sensitive | SC | G4 | G3 |
| 58 | | | Strix | varia | BARRED OWL | x | | | | | G5 | SU |

# Appendix A: Terrestrial Vertebrate Wildlife Species List

| | | | | | | Observed? | | | Status | | Rank | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Order | Family | Genus | species | Common name | 2000-2003 | Past | Exp. | State | Federal | Global | State |
| 59 | | | Asio | otus | LONG-EARED OWL | x | | | | | G5 | S4? |
| 60 | | | Asio | flammeus | SHORT-EARED OWL | x | | | | | G5 | S4? |
| 61 | | | Aegolius | acadicus | NORTHERN SAW-WHET OWL | x | | | | | G5 | S4? |
| 62 | Caprimulgiformes | Caprimulgidae | Chordeiles | minor | COMMON NIGHTHAWK | x | | | | | G5 | S5 |
| 63 | | | Phalaenoptilus | nuttallii | COMMON POORWILL | x | | | | | G5 | SU |
| 64 | Apodiformes | Apodidae | Chaetura | vauxi | VAUX'S SWIFT | x | | | | | G5 | S5 |
| 65 | | | Aeronautes | saxatalis | WHITE-THROATED SWIFT | x | | | | | G5 | S4? |
| 66 | | Trochilidae | Archilochus | alexandri | BLACK-CHINNED HUMMINGBIRD | x | | | | | G5 | S4 |
| 67 | | | Selasphorus | rufus | RUFOUS HUMMINGBIRD | x | | | | | G5 | S4 |
| 68 | | | Stellula | calliope | CALLIOPE HUMMINGBIRD | x | | | | | G5 | S4? |
| 69 | Coraciiformes | Alcedinidae | Cervle | alcyon | BELTED KINGFISHER | x | | | | | G5 | S4 |
| 70 | Piciformes | Picidae | Melanerpes | lewis | LEWIS'S WOODPECKER | x | | | Sensitive | SC | G5 | S4 |
| 71 | | | Sphyrapicus | nuchalis | RED-NAPED SAPSUCKER | x | | | | | G5 | S4 |
| 72 | | | Sphyrapicus | thyroideus | WILLIAMSON'S SAPSUCKER | x | | | | | G5 | S4 |
| 73 | | | Picoides | pubescens | DOWNY WOODPECKER | x | | | | | G5 | S4 |
| 74 | | | Picoides | villosus | HAIRY WOODPECKER | x | | | | | G5 | S4 |
| 75 | | | Picoides | albolarvatus | WHITE-HEADED WOODPECKER | | x | | Sensitive | | G5 | S3 |
| 76 | | | Picoides | arcticus | BLACK-BACKED WOODPECKER | | x | | Sensitive | | G5 | S3 |
| 77 | | | Colaptes | auratus | NORTHERN FLICKER | x | | | | | G5 | S5 |
| 78 | Passeriformes | Tyrannidae | Contopus | sordidulus | WESTERN WOOD-PEWEE | x | | | | | G5 | S4 |
| 79 | | | Empidonax | traillii | WILLOW FLYCATCHER | | x | | | SC | G5 | S4 |
| 80 | | | Empidonax | oberholseri | DUSKY FLYCATCHER | x | | | | | G5 | S4 |
| 81 | | | Empidonax | wrightii | GRAY FLYCATCHER | x | | | | | G5 | S4 |
| 82 | | | Sayornis | saya | SAY'S PHOEBE | x | | | | | G5 | S4? |
| 83 | | | Myiarchus | cinerascens | ASH-THROATED FLYCATCHER | x | | | | | G5 | S4? |
| 84 | | | Tyrannus | verticalis | WESTERN KINGBIRD | x | | | | | G5 | S5 |
| 85 | | | Tyrannus | tyrannus | EASTERN KINGBIRD | x | | | | | G5 | S4 |
| 86 | | Alaudidae | Eremophila | alpestris | HORNED LARK | x | | | | | G5 | S5 |
| 87 | | Hirundinidae | Tachycineta | bicolor | TREE SWALLOW | | | x | | | G5 | S5 |
| 88 | | | Tachycineta | thalassina | VIOLET-GREEN SWALLOW | x | | | | | G5 | S5 |
| 89 | | | Stelgidopteryx | serripennis | N. ROUGH-WINGED SWALLOW | x | | | | | G5 | S4 |
| 90 | | | Riparia | riparia | BANK SWALLOW | x | | | Sensitive | | G5 | S4 |
| 91 | | | Petrochelidon | pyrrhonata | CLIFF SWALLOW | x | | | | | G5 | S5 |
| 92 | | | Hirundo | rustica | BARN SWALLOW | x | | | | | G5 | S5 |
| 93 | | Corvidae | Cyanocitta | stelleri | STELLER'S JAY | x | | | | | G5 | S5 |
| 94 | | | Aphelocoma | californica | WESTERN SCRUB JAY | x | | | | | G5 | S5 |
| 95 | | | Gymnorhinus | cyanocephalus | PINYON JAY | x | | | | | G5 | S3S4? |
| 96 | | | Nucifraga | columbiana | CLARK'S NUTCRACKER | x | | | | | G5 | S4 |
| 97 | | | Pica | pica | BLACK-BILLED MAGPIE | x | | | | | G5 | S5 |
| 98 | | | Corvus | brachyrhyncos | AMERICAN CROW | x | | | | | G5 | S5 |
| 99 | | | Corvus | corax | COMMON RAVEN | x | | | | | G5 | S4 |
| 100 | | Paridae | Parus | atricapillus | BLACK-CAPPED CHICKADEE | x | | | | | G5 | S5 |
| 101 | | | Parus | gambeli | MOUNTAIN CHICKADEE | x | | | | | G5 | S4 |
| 102 | | Aegithalidae | Psaltriparus | minimus | BUSHTIT | x | | | | | G5 | S5 |
| 103 | | Sittidae | Sitta | canadensis | RED-BREASTED NUTHATCH | x | | | | | G5 | S5 |
| 104 | | | Sitta | carolinensis | WHITE-BREASTED NUTHATCH | x | | | | | G5 | S4 |
| 105 | | | Sitta | pygmaea | PYGMY NUTHATCH | | x | | Sensitive | | G5 | S4? |

# Appendix A: Terrestrial Vertebrate Wildlife Species List

| | | | | | | Observed? | | | Status | | Rank | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Order | Family | Genus | species | Common name | 2000-2003 | Past | Exp. | State | Federal | Global | State |
| 106 | | Certhiidae | Certhia | americana | BROWN CREEPER | x | | | | | G5 | S4 |
| 107 | | Troglodytidae | Salpinctes | obsoletus | ROCK WREN | x | | | | | G5 | S5 |
| 108 | | | Catherpes | mexicanus | CANYON WREN | x | | | | | G5 | S4 |
| 109 | | | Troglodytes | aedon | HOUSE WREN | x | | | | | G5 | S4 |
| 110 | | | Troglodytes | troglodytes | WINTER WREN | x | | | | | G5 | S4 |
| 111 | | | Cistothorus | palustris | MARSH WREN | x | | | | | G5 | S5 |
| 112 | | Regulidae | Regulus | satrapa | GOLDEN-CROWNED KINGLET | x | | | | | G5 | S4 |
| 113 | | | Regulus | calendula | RUBY-CROWNED KINGLET | x | | | | | G5 | S4 |
| 114 | | Muscicapidae | Sialia | mexicana | WESTERN BLUEBIRD | x | | | | | G5 | S4 |
| 115 | | | Sialia | currucoides | MOUNTAIN BLUEBIRD | x | | | | | G5 | S4 |
| 116 | | | Myadestes | townsendi | TOWNSEND'S SOLITAIRE | x | | | | | G5 | S4 |
| 117 | | | Catharus | guttatus | HERMIT THRUSH | x | | | | | G5 | S4 |
| 118 | | | Turdus | migratorius | AMERICAN ROBIN | x | | | | | G5 | S5 |
| 119 | | | Ixoreus | naevius | VARIED THRUSH | x | | | | | G5 | S4 |
| 120 | | Mimidae | Dumetella | carolinensis | GRAY CATBIRD | x | | | | | G5 | S4?B |
| 121 | | | Mimus | polyglottos | NORTHERN MOCKINGBIRD | x | | | | | G5 | S4 |
| 122 | | | Oreoscoptes | montanus | SAGE THRASHER | | | x | | | G5 | S4 |
| 123 | | Bombycillidae | Bombycilla | cedrorum | CEDAR WAXWING | x | | | | | G5 | S5 |
| 124 | | Laniidae | Lanius | ludovicianus | LOGGERHEAD SHRIKE | x | | | Sensitive | | G4G5 | S4 |
| 125 | | | Lanius | excubitor | NORTHERN SHRIKE | x | | | | | G5 | S4N |
| 126 | | Sturnidae | *Sturnus* | *vulgaris* | *EUROPEAN STARLING* | x | | | | | G5 | SE |
| 127 | | Motacillidae | Anthus | rubescens | AMERICAN PIPIT | x | | | | | G5 | SU |
| 128 | | Vireonidae | Vireo | cassinii | CASSIN'S VIREO | x | | | | | G5 | S4? |
| 129 | | | Vireo | gilvus | WARBLING VIREO | x | | | | | G5 | S5 |
| 130 | | Emberizidae | Vermivora | celata | ORANGE-CROWNED WARBLER | x | | | | | G5 | S5 |
| 131 | | | Dendroica | petechia | YELLOW WARBLER | x | | | | | G5 | S4 |
| 132 | | | Dendroica | coronata | YELLOW-RUMPED WARBLER | x | | | | | G5 | S5 |
| 133 | | | Dendroica | nigrescens | BLACK-THROATED GRAY WARBLER | x | | | | | G5 | S5 |
| 134 | | | Dendroica | townsendi | TOWNSEND'S WARBLER | x | | | | | G5 | S4 |
| 135 | | | Oporornis | tolmiei | MACGILLIVRAY'S WARBLER | x | | | | | G5 | S4 |
| 136 | | | Geothlypis | trichas | COMMON YELLOWTHROAT | x | | | | | G5 | S5 |
| 137 | | | Wilsonia | pusilla | WILSON'S WARBLER | x | | | | | G5 | S5 |
| 138 | | | Icteria | virens | YELLOW-BREASTED CHAT | x | | | Sensitive | SC | G5 | S4? |
| 139 | | | Piranga | rubra | WESTERN TANAGER | x | | | | | G5 | S4 |
| 140 | | | Pheucticus | melanocephalus | BLACK-HEADED GROSBEAK | x | | | | | G5 | S5 |
| 141 | | | Passerina | amoena | LAZULI BUNTING | x | | | | | G5 | S4 |
| 142 | | | Pipilo | chlorurus | GREEN-TAILED TOWHEE | | | ? | | | G5 | S4 |
| 143 | | | Pipilo | maculatus | SPOTTED TOWHEE | x | | | | | G5 | S5 |
| 144 | | | Spizella | passerina | CHIPPING SPARROW | x | | | | | G5 | S4 |
| 145 | | | Spizella | breweri | BREWER'S SPARROW | x | | | | | G4 | S4 |
| 146 | | | Pooecetes | gramineus | VESPER SPARROW | x | | | | | G5 | S4 |
| 147 | | | Chondestes | grammacus | LARK SPARROW | x | | | | | G5 | S4? |
| 148 | | | Passerculus | sandwichensis | SAVANNAH SPARROW | x | | | | | G5 | S5 |
| 149 | | | Ammodramus | savannarum | GRASSHOPPER SPARROW | | | ? | | | G4 | S2? |
| 150 | | | Passerella | iliaca | FOX SPARROW | x | | | | | G5 | S4 |
| 151 | | | Melospiza | melodia | SONG SPARROW | x | | | | | G5 | S5 |
| 152 | | | Melospiza | lincolnii | LINCOLN'S SPARROW | x | | | | | G5 | S4 |

# Appendix A: Terrestrial Vertebrate Wildlife Species List

| | | | | | | Observed? | | | Status | | Rank | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Order | Family | Genus | species | Common name | 2000-2003 | Past | Exp. | State | Federal | Global | State |
| 153 | | | Zonotrichia | leucophrys | WHITE-CROWNED SPARROW | x | | | | | G5 | S5 |
| 154 | | | Zonotrichia | atricapilla | GOLDEN-CROWNED SPARROW | x | | | | | G5 | S5N |
| 155 | | | Junco | hyemalis | DARK-EYED JUNCO | x | | | | | G5 | S5 |
| 156 | | | Calcarius | lapponicus | LAPLAND LONGSPUR | x | | | | | G5 | S2N |
| 157 | | | Agelaius | phoeniceus | RED-WINGED BLACKBIRD | x | | | | | G5 | S5 |
| 158 | | | Agelaius | tricolor | TRICOLORED BLACKBIRD | x | | | Sensitive | SC | G3 | S2 |
| 159 | | | Sturnella | neglecta | WESTERN MEADOWLARK | x | | | | | G5 | S4 |
| 160 | | | Xanthocephalus | xanthocephalus | YELLOW-HEADED BLACKBIRD | x | | | | | G5 | S5 |
| 161 | | | Euphagus | cyanocephalus | BREWER'S BLACKBIRD | x | | | | | G5 | S5 |
| 162 | | | Molothrus | ater | BROWN-HEADED COWBIRD | x | | | | | G5 | S5 |
| 163 | | | Icterus | bullockii | BULLOCK'S ORIOLE | x | | | | | G5 | S4 |
| 164 | | Fringillidae | Pinicola | enucleator | PINE GROSBEAK | | x | | | | G5 | S2? |
| 165 | | | Carpodacus | cassinii | CASSIN'S FINCH | | | x | | | G5 | S4 |
| 166 | | | Carpodacus | mexicanus | HOUSE FINCH | x | | | | | G5 | S5 |
| 167 | | | Loxia | curvirostra | RED CROSSBILL | x | | | | | G5 | S4 |
| 168 | | | Carduelis | pinus | PINE SISKIN | x | | | | | G5 | S5 |
| 169 | | | Carduelis | psaltria | LESSER GOLDFINCH | x | | | | | G5 | S4 |
| 170 | | | Carduelis | tristis | AMERICAN GOLDFINCH | x | | | | | G5 | S4 |
| 171 | | | Coccothraustes | vespertinus | EVENING GROSBEAK | x | | | | | G5 | S5 |
| 172 | | Passeridae | *Passer* | *domesticus* | *HOUSE SPARROW* | x | | | | | G5 | SE |
| **MAMMALS:** | | | | | | | | | | | | |
| 1 | Insectivora | Soricidae | Sorex | preblei | PREBLE'S SHREW | | | ? | | SC | G4 | S3 |
| 2 | | | Sorex | vagrans | VAGRANT SHREW | | | x | | | G5 | S4 |
| 3 | | | Sorex | palustris | WATER SHREW | | | ? | | | G5 | S4 |
| 4 | | | Sorex | merriami | MERRIAM'S SHREW | | | x | | | G5 | S3 |
| 5 | | Talpidae | Scapanus | orarius | COAST MOLE | | | ? | | | G5 | S5? |
| 6 | Chiroptera | Vespertilionidae | Myotis | californicus | CALIFORNIA MYOTIS | x | | | | | G5 | S4 |
| 7 | | | Myotis | ciliolabrum | WESTERN SMALL-FOOTED MYOTIS | x | | | Sensitive | SC | G5 | S4 |
| 8 | | | Myotis | yumanensis | YUMA MYOTIS | x | | | Sensitive | SC | G5 | S3 |
| 9 | | | Myotis | lucifugus | LITTLE BROWN MYOTIS | x | | | | | G5 | S4 |
| 10 | | | Myotis | volans | LONG-LEGGED MYOTIS | x | | | Sensitive | SC | G5 | S3 |
| 11 | | | Myotis | thysanodes | FRINGED MYOTIS | | | x | Sensitive | SC | G5 | S3 |
| 12 | | | Myotis | evotis | LONG-EARED MYOTIS | x | | | Sensitive | SC | G5 | S3 |
| 13 | | | Lasionycteris | noctivagans | SILVER-HAIRED BAT | x | | | Sensitive | SC | G5 | S4? |
| 14 | | | Pipistrellus | hesperus | WESTERN PIPISTRELLE | x | | | | | G5 | S4 |
| 15 | | | Eptesicus | fuscus | BIG BROWN BAT | x | | | | | G5 | S4 |
| 16 | | | Lasiurus | cinereus | HOARY BAT | x | | | | | G5 | S4? |
| 17 | | | Euderma | maculata | SPOTTED BAT | x | | | | SC | G4 | S1 |
| 18 | | | Corynorhinus | townsendii | PALE WESTERN BIG-EARED BAT | | x | | Sensitive | SC | G4 | S4 |
| 19 | | | Antrozous | pallidus | PALLID BAT | x | | | Sensitive | | G5 | S3S4 |
| 20 | Lagomorpha | Leporidae | Brachylagus | idahoensis | PYGMY RABBIT | | | x | Sensitive | SC | G5 | S2? |
| 21 | | | Sylvilagus | nuttallii | MOUNTAIN COTTONTAIL | x | | | | | G5 | S4 |
| 22 | | | Lepus | townsendii | WHITE-TAILED JACKRABBIT | | x | | Sensitive | | G5 | S4? |
| 23 | | | Lepus | californicus | BLACK-TAILED JACKRABBIT | x | | | | | G5 | S4 |
| 24 | Rodentia | Sciuridae | Tamias | minimus | LEAST CHIPMUNK | x | | | | | G5 | S4 |
| 25 | | | Tamias | amoenus | YELLOW-PINE CHIPMUNK | | | ? | | | G5 | S4 |

# Appendix A: Terrestrial Vertebrate Wildlife Species List

| | | | | | | Observed? | | | Status | | Rank | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Order | Family | Genus | species | Common name | 2000-2003 | Past | Exp. | State | Federal | Global | State |
| 26 | | | Marmota | flaviventris | YELLOW-BELLIED MARMOT | x | | | | | G5 | S4 |
| 27 | | | Spermophilus | townsendii | TOWNSEND'S GROUND SQUIRREL | | | ? | | | G5 | S4 |
| 28 | | | Spermophilus | beldingii | BELDING'S GROUND SQUIRREL | | | ? | | | G5 | S5 |
| 29 | | | Spermophilus | beecheyi | CALIFORNIA GROUND SQUIRREL | | | ? | | | G5 | S5 |
| 30 | | | Spermophilus | lateralis | GOLDEN-MANTLED GRD. SQUIRREL | x | | | | | G5 | S4 |
| 31 | | | Tamiasciurus | douglasii | DOUGLAS' SQUIRREL | x | | | | | G5 | S5 |
| 32 | | | Glaucomys | sabrinus | NORTHERN FLYING SQUIRREL | | x | | | | G5 | S4 |
| 33 | | Geomvidae | Thomomys | talpoides | NORTHERN POCKET GOPHER | x | | | | | G5 | S4 |
| 34 | | Heteromvidae | Perognathus | parvus | GREAT BASIN POCKET MOUSE | | | x | | | G5 | SU |
| 35 | | | Dipodomys | ordii | ORD'S KANGAROO RAT | x | | | | | G5 | S4 |
| 36 | | Castoridae | Castor | canadensis | BEAVER | x | | | | | G5 | S5 |
| 37 | | Muridae | Reithrodontomys | megalotis | WESTERN HARVEST MOUSE | | | x | | | G5 | S4 |
| 38 | | | Peromyscus | maniculatus | DEER MOUSE | x | | | | | G5 | G5 |
| 39 | | | Peromyscus | crinitus | CANYON MOUSE | | | x | | | G5 | S4 |
| 40 | | | Peromyscus | truei | PINON MOUSE | | | ? | | | G5 | S4? |
| 41 | | | Onychomys | leucogaster | NORTHERN GRASSHOPPER MOUSE | | | x | | | G5 | S4? |
| 42 | | | Neotoma | cinerea | BUSHY-TAILED WOODRAT | x | | | | | G5 | S5 |
| 43 | | | Microtus | montanus | MONTANE VOLE | | | ? | | | G5 | S5 |
| 44 | | | Microtus | longicaudus | LONG-TAILED VOLE | | | x | | | G5 | S5 |
| 45 | | | Lemmiscus | curtatus | SAGEBRUSH VOLE | x | | x | | | G5 | S4 |
| 46 | | | Ondatra | zibethicus | MUSKRAT | x | | ? | | | G5 | S5 |
| 47 | | | *Mus* | *musculus* | *HOUSE MOUSE* | | | ? | | | G5 | SE |
| 48 | | Dipodidae | Zapus | princeps | WESTERN JUMPING MOUSE | | | ? | | | G5 | S4 |
| 49 | | Erethizontidae | Erethizon | dorsatum | PORCUPINE | x | | | | | G5 | S5 |
| 50 | Carnivora | Canidae | Canis | latrans | COYOTE | x | | | | | G5 | S5 |
| 51 | | Ursidae | Ursus | americanus | BLACK BEAR | x | | | | | G5 | S4 |
| 52 | | Procvonidae | Procvon | lotor | RACCOON | x | | | | | G5 | S5 |
| 53 | | Mustelidae | Mustela | erminea | ERMINE | | | ? | | | G5 | S5 |
| 54 | | | Mustela | frenata | LONG-TAILED WEASEL | | | x | | | G5 | S5 |
| 55 | | | Mustela | vison | MINK | | | x | | | G5 | S5 |
| 56 | | | Taxidea | taxus | AMERICAN BADGER | x | | | | | G5 | S4 |
| 57 | | | Spilogale | gracilis | WESTERN SPOTTED SKUNK | | | x | | | G5 | S4 |
| 58 | | | Mephitis | mephitis | STRIPED SKUNK | | | x | | | G5 | S5 |
| 59 | | | Lutra | canadensis | NORTHERN RIVER OTTER | x | | | | | G5 | S4? |
| 60 | | Felidae | Felis | concolor | MOUNTAIN LION | x | | | | | G5 | S4? |
| 61 | | | Lynx | rufus | BOBCAT | x | | | | | G5 | S4 |
| 62 | Artiodactyla | Cervidae | Cervus | elaphus | ELK | x | | | | | G5 | S5 |
| 63 | | | Odocoileus | hemionus | MULE DEER | x | | | | | G5 | S5 |
| 64 | | Antilocapridae | Antilocapra | americana | PRONGHORN | x | | | | | G5 | S4 |
| 65 | | Bovidae | Ovis | canadensis | BIGHORN SHEEP | x | | | | SC | G4G5 | S2 |
| 66 | | | *Ovis* | *aries* | *AUDAD SHEEP (Feral)* | x | | | | | | SE |
| 67 | | Suidae | *Sus* | *scrofa* | *FERAL HOG* | | | ? | | | | SE |

## APPENDIX B. WILDLIFE HABITAT CONSERVATION AND MANAGEMENT PLAN.

### Pine Creek Ranch, Confederated Tribes of Warm Springs
### Revised and Amended November 2002
### Including Wagner Ranch, Acquired in 2001.

**SUMMARY OF PLAN:**

The subject property was purchased in two acquisitions: the original Pine Creek Ranch in October 1999 and Wagner Ranch in September 2001, through Bonneville Power Administration Wildlife and Watershed Mitigation funds. In accordance with provisions of the Northwest Power Act and a Memorandum Of Agreement (MOA, Appendix A) between BPA and the Confederated Tribes, certain activities will be either allowed or restricted as part of a management plan. This Wildlife Habitat Conservation and Management Plan, as approved by the Oregon Department of Fish and Wildlife, makes the subject property eligible for Wildlife Habitat Conservation Deferral. The primary management objective of the subject property is the protection of wildlife habitat. The primary management approach will be the maintenance and/or restoration of native vegetation communities.

ANTICIPATED FINANCIAL IMPACT:

Pine Creek Ranch, including Wagner Ranch, has historically been, and is currently, taxed at a deferred ranch tax rate. Changing the tax to a Wildlife Habitat Conservation Deferral would result in no change to the taxes paid to Wheeler County.

The planned management for wildlife habitat on Pine Creek Ranch will result in increased income to local businesses. The property is open to public game and bird hunting on a limited basis, and hunters are likely to spend money at local businesses. Management activities on Pine Creek Ranch will result in revenues for local businesses through purchases of fuels, supplies, and services. Permanent staff, temporary staff or visiting staff, and visiting researchers will also support local businesses.

1. OWNER:

Subject property is owned by the Confederated Tribes of the Warm Springs Reservation of Oregon. The Confederated Tribes may be reached through Mark Berry, Habitat Manager of Pine Creek Ranch, at 39067 Highway 218, Fossil, OR 97830, (541) 489-3477; or Terry Luther, Fish and Wildlife Manager, PO Box C, Warm Springs, OR 97761, (541) 553-2026.

2. COOPERATING AGENCIES:

Oregon Department of Fish & Wildlife
Heppner District Office
PO Box 363
Heppner, OR 97836

Natural Resources Conservation Service, USDA
333 Main St., Box 106
Condon, OR 97823

Bureau of Land Management
Prineville District
3050 NE Third, PO Box 550
Prineville, OR 97754

Oregon Museum of Science and Industry
Hancock Field Station
39472 Highway 218
Fossil, OR 97830

Wheeler Soil & Water Cons. District
P.O. Box 431
Fossil, OR 97830-0431

The Nature Conservancy
821 SE 14th Ave.
Portland, OR 97214

3. LEGAL DESCRIPTION:

A legal description of the subject property is attached as Appendix B. Property boundaries are also indicated in Figure 1.

4. ACREAGE:

The subject property includes approximately 24, 304 acres of deeded lands within the original Pine Creek Ranch acquisition and 9,253 acres of deeded lands within the Wagner Ranch acquisition.

5. STATEMENT OF COMPLIANCE:

Statement signed by planning dept. of Wheeler County that the county has made findings demonstrating compliance with the criteria in Section (3)(1)(a), (b), (c) and (e) of Chapter 764, Oregon Laws 1993.

## PROPERTY DESCRIPTION:

a) Perennial and Intermittent Streams

The entire property lies within the watershed of the lower John Day River (Figure 1). The Wagner acquisition includes approximately six miles of riverfront on the John Day, located in parcels separated by BLM land. All riverfront parcels are on the right bank, and are located between river miles 123 and 132.

Pine Creek is a tributary of the main stem John Day River and parallels State Highway 218 before reaching the John Day near Clarno. The subject property includes approximately 10 miles of Pine Creek, and borders approximately one-quarter mile of the John Day River at the mouth of Pine Creek. The property includes 15,382 acres within the 41,701 Pine Creek watershed, approximately 37% of the watershed. An additional 1,874 acres of federal land within the watershed are managed by the BLM, and 1,587 acres are within the John Day Fossil Beds National Monument. Approximately 55% of the Pine Creek watershed (22,842 acres) is in private ownership.

Pine Creek is a perennial stream, although certain sections currently lack surface flow during late summer into fall of dry years. Major tributaries of Pine Creek include Cove Creek (1,545 acres, or 18%, within the subject property), Robinson Canyon (3,321 acres, or 55%, within the subject property), and Lone Pine Creek (the northwestern side

of this drainage falls within the property boundary, with 1,133 acres and 52%, but the streambed and the southeastern side are outside of the property). Numerous smaller drainages tributary to Pine Creek contain ephemeral or intermittent streams, many of which are unnamed. The upper reaches of Pine Creek, above Lone Pine Creek, include 9,518 acres in private ownership outside of the subject property.

The largest drainages with ephemeral or intermittent streams originating on the subject property outside of the Pine Creek watershed are Rhodes Canyon, Rattlesnake Canyon, Amine Canyon, and Rock Canyon. Rhodes, Rattlesnake, and Amine Canyons all flow into the John Day River near river mile 122, with Rock Canyon's mouth at river mile 125 . The subject property includes approximately 67% of the 10,940 acre Rhodes Canyon watershed, 80% of the 6,176-acre Rattlesnake Canyon watershed, 28% of the 2,000-acre Amine Canyon watershed, and 59% of the 1,385-acre Rock Canyon watershed. The majority of the remainder of each watershed is federal land under BLM management, with some of the Rhodes and Rattlesnake watersheds in private lands outside of the subject property.

The subject property also includes portions of the Rowe Creek, Hay Bottom Canyon, and Eagle Canyon watersheds.

b) Ponds

The subject property contains no lakes or large ponds. Numerous small artificial ponds currently exist, which either block the flow of springs or dam small drainages to create water sources for livestock. Beaver ponds exist along Pine Creek (see below).

c) Riparian Areas and Wetlands

Riparian vegetation occurs along the John Day River, Pine Creek, and portions of tributary streams. Riparian habitats have been degraded, due to historic removal of beaver, overgrazing by domestic livestock, upstream watershed alterations, agricultural practices, and flooding. Pine Creek lands have passed through many changes of ownership, with associated changes in grazing practices.

The portions of the lower John Day abutting Pine Creek Ranch vary considerably in the geomorphology of the valley bottom: ranging from broad floodplains to narrow canyon segments constricted by rock outcrops. Areas with broad floodplains presumably once supported more diverse riparian vegetation than narrow canyon areas. Cottonwoods were likely present, along with willow and diverse shrub and herbaceous communities. Floodplains may have been dominated by basin wildrye and big sagebrush.
Current conditions on the mainstem John Day River within the ranch vary greatly. The Wagner Ranch portion of the property includes two primary agricultural fields on floodplains, several other low terrace areas, and a large portion of steep riverbank grading directly into upland slopes or rock outcrops. A few islands occur along this section of the river, ranging from a high terrace with a few ponderosa pines to low gravel bars.

The agricultural fields on the Wagner parcel have been fallow for at least several years, since acquisition by the prior owner in 1998. They are not entirely flat fields, and include several lower swales or flood channels that increase the potential habitat diversity. Weedy annual grasses and noxious weeds currently dominate the fields. Scattered patches of native basin wild rye and other perennial grasses remain.

Unplowed terrace areas along the John Day are in better condition, with native bunchgrasses, sagebrush, and juniper present, although annual grasses and weeds also occur in these areas.

Riparian vegetation shows minimal development along the Wagner Ranch portion of the John Day, with only occasional patches of willow, and relatively sparse communities of native sedges and rushes. Reed canary grass, along with sedges, commonly forms a narrow strip of riparian vegetation along the bank.

A GWEB restoration project was conducted on Pine Creek in the late 1980s and early 1990s, aimed at improving riparian conditions through controlling grazing, instream restoration work, and watershed management. After a subsequent change in ownership, heavy grazing again occurred in riparian areas.

Current conditions of riparian habitats range greatly along the length of Pine Creek. Some areas have diverse native vegetation, including a large component of deciduous shrubs, while others are sparsely vegetated. Cottonwoods occur in scattered locations along the upper portion of Pine Creek and in lower Robinson Canyon, while non-native deciduous trees are common near old and current home sites. In most areas the stream is incised below the floodplain, often by 7 to 10 feet. Beaver are now common along Pine Creek, and their activities create a diverse set of pond and wetland conditions along the creek.

Smaller drainages, including tributaries to Pine Creek, Rattlesnake Canyon, and Rhodes Canyon, have scattered patches of willow and riparian vegetation, typically near spring sources.

d) Threatened or Endangered Plant Species

Only one listed plant species is documented on the subject property in the Oregon Natural Heritage Program database. Dwarf evening-primrose (Camissonia pygmaea) was observed in rocky talus 2.3 miles east of Clarno on Highway 218 in 1978.

e) Native Vegetation

The subject property contains a diverse set of native vegetation communities. A botanical survey of the property has not taken place, however, a draft plant species list is attached as Appendix D**.** This list was developed based on a listing of plant species found in the vicinity of OMSI Hancock Field Station (Thompson & Miller, 1981), a plant survey of the John Day Fossil Beds National Monument (Youtie & Winward, 1977), and observations made since purchase of the property.

Native vegetation communities vary with elevation, slope, aspect, soils, and disturbance history. Each of these communities varies considerably in its composition, and numerous intermediate types exist. Plant communities have not been mapped on the subject property. Most or all areas of native vegetation also include a component of non-native species. Widespread or conspicuous vegetation types are listed below:

1) Native grasslands are typically dominated by blue-bunch wheatgrass (Agropyron spicatum), Idaho fescue (Festuca idahoensis), Sandberg's bluegrass (Poa secunda), and include many other grass and forb species.

2) Big sagebrush (Artemisia tridentata) is a dominant species on many slopes and benches, as well as in some floodplains that have not been farmed or plowed.

3) Western juniper (Juniperus occidentalis) is common across the property, ranging widely in density.

4) Stiff sagebrush (Artemisia rigida) is a dominant low shrub on higher elevation rocky soils.

5) Mountain mahogany (Cercocarpus ledifolius) communities occur on rocky ridges and slopes, and within rocky canyons.

6) Riparian vegetation communities include several species of willow (Salix sp.), Chokecherry (Prunus virginiana), Blue elderberry (Sambucus cerulea), and other deciduous trees and shrubs.

7) Higher elevation riparian areas include a component of quaking aspen (Populus tremuloides).

8) The majority of the floodplains along Pine Creek have historically been farmed for grain or hay crops. Noxious weeds or non-native grasses currently dominate most of these sites. Some still have alfalfa cover.

9) Higher elevation sites, such as the upper end of Little Pine Canyon, support a ponderosa pine (Pinus ponderosa) and Douglas fir (Pseudotsuga menziesii) forest. This area was heavily logged prior to acquisition of the subject property.

f) Sensitive, Threatened, or Endangered Wildlife Species

No Endangered Species are currently known or expected to occur on the ranch, however, several Threatened species and numerous Species of Concern or Sensitive species are known or expected to occur (Table 4). A draft list of all Terrestrial Vertebrate species on the ranch is attached as Appendix C.

**Table 1. Species listed as Endangered, Threatened, Candidate, Species of Concern, or Sensitive.**

| Species | Scientific Name | US | | | OR | | Observed | | Expected |
|---|---|---|---|---|---|---|---|---|---|
| | | T | C | SC | T | S | 00-02 | Prior | |
| **MAMMALS** | | | | | | | | | |
| Pygmy rabbit | *Brachylagus idahoensis* | | | √ | | √ | | | √ |
| White-tailed jackrabbit | *Lepus townsendii* | | | | | √ | | √ | |
| Pale western big-eared bat | *Corynorhinus townsendii pallescens* | | | √ | | √ | | √ | |
| Spotted bat | *Euderma maculatum* | | | √ | | | √ | | |
| Silver-haired bat | *Lasionycteris noctivagans* | | | √ | | √ | √ | | |
| Small-footed myotis | *Myotis ciliolabrum* | | | √ | | √ | √ | | |
| Long-eared myotis | *Myotis evotis* | | | √ | | √ | √ | | |
| Long-legged myotis | *Myotis volans* | | | √ | | √ | √ | | |
| Yuma myotis | *Myotis yumanensis* | | | √ | | √ | √ | | |
| Pallid bat | *Antrozous pallidus* | | | | | √ | √ | | |
| California wolverine | *Gulo gulo luteus* | | | √ | √ | | | √ | |
| Bighorn sheep | *Ovis canadensis* | | | √ | | | √ | | |
| **BIRDS** | | | | | | | | | |
| Bald eagle | *Halieatus leucocephalus* | √ | | | √ | | √ | | |
| Mountain quail | *Oreortyx pictus* | | | √ | | | √ | | |
| Ferruginous hawk | *Buteo regalis* | | | √ | | √ | | | √ |
| Northern goshawk | *Accipiter gentilis* | | | √ | | √ | √ | | |
| Western burrowing owl | *Athene cunicularia hypugea* | | | √ | | √ | | √ | |
| Lewis' woodpecker | *Melanerpes lewis* | | | √ | | √ | √ | | |
| Willow flycatcher | *Empidonax trailli adastus* | | | √ | | | | √ | |

| Species | Scientific Name | US | | | OR | | Observed | | Expected |
|---|---|---|---|---|---|---|---|---|---|
| | | T | C | SC | T | S | 00-02 | Prior | |
| Yellow-breasted chat | *Icteria virens* | | | √ | | | √ | | |
| Tricolored blackbird | *Agelaius tricolor* | | | √ | | √ | √ | | |
| Swainson's hawk | *Buteo swainsoni* | | | | | √ | | √ | |
| Sandhill crane | *Grus canadensis* | | | | | √ | √ | | |
| Flammulated owl | *Otus flammeolus* | | | | | √ | | √ | |
| Northern pygmy owl | *Glaucidium gnoma* | | | | | √ | √ | | |
| White-headed woodpecker | *Picoides albolarvatus* | | | | | √ | | √ | |
| Black-backed woodpecker | *Picoides arcticus* | | | | | √ | | √ | |
| Horned lark | *Eremophila alpestris* | | | | | √ | √ | | |
| Bank swallow | *Riparia riparia* | | | | | √ | √ | | |
| Pygmy nuthatch | *Sitta pygmaea* | | | | | √ | | √ | |
| Loggerhead shrike | *Lanius ludovicianus* | | | | | √ | √ | | |
| **AMPHIBIANS** | | | | | | | | | |
| Columbia spotted frog | *Rana luteiventris* | | √ | | | √ | | | √ |
| Western toad | *Bufo boreas* | | | | | √ | √ | | |
| **FISH** | | | | | | | | | |
| Middle Columbia summer steelhead | *Oncorhyncus mykiss* | √ | | | | | √ | | |
| Pacific lamprey | *Lampetra tridentata* | | | √ | | | √ | | |
| Interior redband trout | *Oncorhyncus mykiss gibbsi* | | | √ | | | √ | | |
| **INVERTEBRATES** | | | | | | | | | |
| Lynn's clubtail dragonfly | *Gomphus lynnae* | | | √ | | | | | √ |

US = USFWS, OR = Oregon, T = Threatened, C = Candidate, SC = Species of Concern, S = Sensitive

g) The Wheeler County Comprehensive Plan identifies no areas as significant wildlife habitat.

h) Forestry

No portion of the subject property is currently managed for forestry. A small area containing Ponderosa Pine (Pinus ponderosa) and Douglas Fir (Pseudotsuga menziesii) was logged several years before acquisition of the property, with most trees of value removed. Forestry is not an intended economic activity on the subject property. Juniper control will take place in order to improve watershed and habitat conditions.

i) Agriculture

No areas are currently farmed, although a majority of Pine Creek floodplains are abandoned farm fields. Some of these areas may be farmed as part of a habitat restoration and noxious weed control process. The ultimate goal will be to restore native plant communities where possible.

j) Soil Classifications from the U.S. Soil Conservation Service Soil Survey

Soil types on the subject property were mapped by the NRCS in 1984. These soil types are correlated in Table 2 to the new Range Site Names currently used by NRCS. Original soil type maps reside at the NRCS in Condon, OR.

k) Dwellings, Roads, Fences, and other artificial structures

1) Structures:

There are two residences on the subject property. The primary ranch house is located near the mouth of Pine Creek on Highway 218, and has associated barns, sheds, and other outbuildings. Employees of the previous owner currently occupy this house.

A second residence and associated outbuildings at 39767 Highway 218 are currently subject to a lifetime lease agreement. The use of these buildings will revert to the Tribes on expiration of the lifetime lease. This complex includes both a historic home and associated buildings, and a modern home and barn.

Two old barns are located on the subject property, one in good condition across Highway 218 from the Clarno Rd., and another across Highway 218 from the Pine Creek Rd. A set of buildings and corrals is located near mile marker 30 on Highway 218.

A cabin with associated outbuildings is located on the Wagner Ranch, between river miles 126 and 127 on the John Day. Several historic cabins exist on the property in various states of disrepair or collapse.

2) Roads:

State Highway 218 bisects the subject property. There are no other paved or gravel roads on the subject property. Dirt roads on the subject property vary greatly in condition. All dirt roads on the property have infestations of noxious weeds, and have apparently served as dispersal corridors for noxious weeds. Many are short spur roads

leading to a stock pond or other water source, while others access remote portions of the property.

3) Fences:

All fences on the property are of barbed-wire construction. Boundary fences vary in condition, and are down in several places.

Interior, or cross, fences occur in several areas, most notably a fence paralleling Pine Creek that was constructed for the purpose of seasonally excluding cattle from riparian areas. Interior fences also vary greatly in condition, and include several that are partially or completely collapsed.

Table 2. Soil types identified on Pine Creek Ranch.

| Type | Percent slopes | Position | Range Site Name (New) |
|---|---|---|---|
| Lickskillet very stony loam | 7 to 40 | Uplands | JD Shallow South 12-16 PZ |
| Rock outcrop - Lickskillet complex | 15 to 70 | | |
| Rock outcrop component | | Uplands | - |
| Lickskillet component | | Uplands | Shallow South 9-12 PZ |
| Snell very stony loam | 40 to 70 | Canyon walls | North 14-18 PZ |
| Tub stony silty clay loam | 20 to 40 north | Uplands | Clayey North 12-16 PZ |
| Tub stony silty clay loam | 40 to 70 north | Canyon walls | Clayey North 12-16 PZ |
| Curant and Wrentham silt loams | 40 to 70 | Canyon walls | |
| Curant silt loam | 8 to 40 | Uplands | North 12-14 PZ |
| Tub and Wrentham soils | 40 to 70 north | | Clayey North 12-16 PZ |
| Tub component | | | North 12-16 PZ |
| Wrentham component | | | |
| Hack loam | 2 to 7 | Terraces | Loamy Bottom |
| Day-Sorf complex | 15 to 45 north | | |
| Day component | | Uplands | Gumbo 9-14 PZ |
| Sorf component | | Uplands | Clayey South 9-12 PZ |
| Simas clay loam | 5 to 40 | Uplands | Clayey 9-12 PZ |
| Simas-Sorf complex | 3 to 40 | Uplands | |
| Simas component | | | Clayey South 9-12 PZ |
| Sorf component | | | Clayey 9-12 PZ |
| Simas clay loam | 5 to 40 | Uplands | North 12-16 PZ |
| Simas-Day complex | 5 to 40 | Uplands | |
| Simas-Tub complex | 5 to 40 | | |
| Simas component | | | Clayey 9-12 PZ |
| Tub component | | | Clayey 12-16 PZ |
| Waterbury very stony silty clay loam | 45 to 70 south | Uplands | Shallow South 12-16 PZ |
| Waterbury very stony silty clay loam | 15 to 45 south | Uplands | Shallow South 12-16 PZ |
| Powder silt loam | 0 to 3 | Stream bottoms | Loamy Bottom |
| Donnely-Sorf-Day complex | 30 to 70 | | |
| Donnely component | | Canyon walls | Shallow South 10-14 PZ |
| Sorf component | | Canyon walls | Clayey South 9-12 PZ |
| Day component | | Canyon walls | Clayey South 9-12 PZ |

# Appendix B: Wildlife Habitat Conservation and Management Plan

## Wildlife Habitat Conservation and Management:

a) Goals and Objectives

1. Overall Goals for the Property

Pine Creek Ranch is intended, as a wildlife and watershed mitigation site, to partially offset wildlife habitat losses caused by John Day Dam on the Columbia River. Habitat management will focus, to the extent possible, on strategies designed to achieve and maintain native habitat that is naturally self-sustaining, as specified in the MOA between BPA and the Tribes.

In many cases, recovery of watershed functions or native plant communities may only occur over the course of several decades. Future climate changes may also limit or prevent recovery to historic conditions.

Where possible, altered or damaged ecosystem functions will be restored through passive restoration techniques, such as the prevention of activities which degrade or prevent recovery. Passive restoration strategies will be paired with active interventions as needed, such as replacement of culverts creating fish passage barriers, for example. It is hoped that these efforts will lead to conservation of biodiversity in the form of native fish, wildlife, and plant communities.

An additional goal for the project is to work in partnership with neighboring landowners, local, state and federal agencies, conservation organizations, and educational groups. Pine Creek Ranch has the potential to serve as a model for watershed recovery and wildlife habitat management in the lower John Day Basin. Successful monitoring of changes to vegetation, wildlife, fish use and distribution and hydrology will be critical to this effort, and collection of baseline data is thus an immediate management priority.

2. Objectives

**Upland Areas**

1. Maintain a diverse, dynamic mosaic of native vegetation communities and wildlife habitats. Maintain or increase the extent of native bunchgrass and shrub steppe communities.

2. Maintain appropriate vegetation for healthy watershed function, including infiltration, storage, and release of water to maintain or improve water quality, water quantity and the timing and duration of flow.

3. Allow the occurrence of natural disturbance processes within their range of natural variability and the practical constraints of limited land area and altered ecological potential.

4. Reduce ongoing encroachment of western juniper into bunchgrass and shrub steppe habitat types. Reduce the impacts of juniper encroachment on watershed hydrology. Maintain a diversity of western juniper age classes and habitat structural conditions.

**Riparian Areas and Floodplains**

5. Facilitate recovery of riparian systems in Proper Functioning Condition (Prichard, 1998) that will allow development of desired habitat characteristics.

6. Provide quality aquatic and riparian habitats for native fish and wildlife, within their natural potential.

7. Establish functioning riparian buffers and wildlife habitat by restoring key native vegetation species in abandoned agricultural fields adjacent to Pine Creek and the John Day River.

**Listed Species**

8. Protect habitats of all listed species as appropriate.

**Wildlife and Fish**

9. Manage for native habitats that will sustain populations of diverse native wildlife species, while providing continued hunting opportunities for tribal members and the public.

10. Protect, maintain, or increase local populations of native steelhead and redband trout (*Oncorhynchus mykiss*) by allowing natural recovery of habitat.

**11.** Eliminate artificial fish passage barriers by replacing problem culverts with appropriate structures.

**Water Rights**

12. Restore irrigation water rights to instream flows. Utilize water rights on an interim basis as needed to achieve management objectives, including establishment of desired vegetation in floodplain fields.

**Introduced Plant Species**

13. Minimize the impacts of introduced species on native vegetation and hydrological function.

14. Reduce the potential spread of noxious weeds to uninfested areas and neighboring lands.

**Grazing and Fences**

15. Allow habitat recovery to occur prior to any managed livestock grazing on deeded lands. Utilize livestock grazing only as a wildlife habitat management tool, in conjunction with this plan and/ or future revisions. Coordinate management of Spring Basin and Amine Peak BLM grazing allotments with Prineville District BLM.

16. Work with neighbors to maintain or replace boundary fences as necessary to minimize trespass grazing.

17. Reduce the impact of interior fences on natural movement patterns of wildlife.

**Roads**

18. Minimize impacts of roads, including erosion and weed dispersal. Maintain only road segments necessary for management access to property. Allow unnecessary road segments to revegetate.

**Fire Management**

19. Allow wildfires to play a role in the restoration and maintenance of native upland habitats, while taking into consideration concerns of neighboring landowners.

20. Utilize prescription fires in a safe and appropriate manner to benefit native habitats, e.g., by minimizing juniper encroachment.

**Tribal and Public Access**

21. Allow regulated tribal and public access. Restrict access or activities that may harm natural resources or interfere with achievement of management objectives.

**Land Exchange**

22. Work with the Prineville District BLM to achieve an equal-value land exchange that would consolidate ranch habitat and facilitate management of tribal and public lands.

**Monitoring and Evaluation**

23. Accurately monitor and evaluate changes in riparian conditions, upland vegetation, and wildlife habitats, and fish and wildlife use. Document the effects of management actions. Facilitate increased understanding of ecosystem recovery processes and potentials.

24. Encourage natural sciences research and educational activities.

b) Conservation and Management Actions, and c) Time Frames

Currently planned management actions are summarized in Table 3. Knowledge of ranch resources, and restoration and management strategies, will continue to increase through monitoring and evaluation. Additional management actions not identified in this plan will likely be necessary.

**Table 3. Management Strategies, Tasks, Relevant Objectives, and Time Frames.**

| Management Strategy | Task | Description | Objectives Addressed | Duration in FYs |
|---|---|---|---|---|
| Monitoring and Evaluation of Physical and Biological Conditions | Habitat Evaluation Procedure (HEP) | Complete Baseline HEP on original Pine Creek Acquisition | 23 | Completed in FY01 |
| | | Complete Baseline HEP on Wagner Acquisition | 23 | Complete in FY03 |
| | Aerial photography | Digital color ortho-photography with 0.5m pixel | 23 | Complete in FY02, Repeat 2012 |
| | Riparian vegetation | Transect sampling at monitoring sites on Pine Creek | 23 | Completed in FY01; repeat 2011 |
| | Upland vegetation | Species composition at permanently marked field transects | 23 | Completed in FY02; repeat 2012 |
| | Vegetation mapping | Following US National Vegetation Classification; Utilizing orthophotography and field transect data. | 23 | Completed in FY02; repeat 2012 |
| | Photo monitoring | Digital photo from riparian & upland monitoring sites | 23 | Ongoing (Annual) |
| | Weather monitoring | Telemetered data-logger of Precipitation, Air temperature, Solar Radiation, Wind Speed /Direction. | 23 | Ongoing (Continuous) |
| | Stream flow | Telemetered data-logging gage, Pine Creek | 23 | Ongoing (Continuous) |
| | Water temperature | Telemetered data-logging probe, Pine Creek | 23 | Ongoing (Continuous) |
| | Water quality | Water Chemistry, Aquatic Macroinvertebrates, and Habitat Conditions incl. channel and vegetation, at 6 Pine Creek sites | 23 | Ongoing (Annual) |
| | Aquatic habitat survey | Modified Hankin & Reeves survey on 10 miles of the John Day River. Repeat every 10 years. | 23 | Completed in FY02; repeat in 2012. |
| | Breeding bird monitoring | Point counts at riparian & upland monitoring sites. | 23 | Ongoing (Annual) |
| | Big game survey | Aerial and/or ground survey to estimate age & sex ratios | 23 | Ongoing (Annual) |

| | | | | |
|---|---|---|---|---|
| | Steelhead spawning | Redd count on Pine Creek (3 miles) | 23 | Ongoing (Annual) |
| **Management Strategy** | **Task** | **Description** | **Objectives Addressed** | **Duration in FYs** |
| Complete and Implement Management Plans | Adopt Wildlife Habitat and Watershed Management Plan | | All | FY03 |
| | Complete Weed Management Plan | Identify priority species of concern and control strategies. Append Weed Management Plan to Wildlife Habitat and Watershed Management Plan. | 1, 2, 3, 5, 6, 7, 9, 13, 14, 18 | |
| | Complete Fire Management Plan | Reach wildfire control responsibility agreement with BPA and BLM. | 1, 2, 3, 4, 9, 19, 20 | FY03- FY04 |
| | | Complete Fire Management Plan, including provisions for response to wildfire and use of prescription fire. Append Fire Management Plan to Wildlife Habitat and Watershed Management Plan. | 1, 2, 3, 4, 9, 19, 20 | FY03- FY04 |
| | Revise Access Regulations as needed. | Continue to work with Access Advisory Committee on an annual basis. | 9, 10, 13, 14, 21 | Ongoing (Annual) |
| **Management Strategy** | **Task** | **Description** | **Objectives Addressed** | **Duration in FYs** |
| Maintain and facilitate recovery of watersheds and habitats. | Treat noxious weeds. | Use mechanical, chemical, and biological control as appropriate. | 1, 2, 3, 5, 6, 7, 9, 13, 14, 18 | Ongoing |
| | Restore native vegetation in disturbed riparian areas. | Propagate native plant stock as needed. Implement CREP Riparian Buffer project on Pine Creek. | 5, 6, 7, 9, 10, 13, 14 | Ongoing |
| | Mechanically control juniper for watershed and habitat benefit. | Chainsaw girdle and/or fell trees in areas of groundwater availability. Do not cut trees with old growth characteristics, nests, or nest cavities. | 1, 2, 3, 4, 5, 6, 9, 19, 20 | Ongoing |
| | Utilize prescribed fire to manage upland habitats. | Plan and conduct prescription fires in areas with young juniper encroaching into sagebrush and bunchgrass vegetation. Coordinate and communicate closely with neighboring landowners. | 1, 2, 3, 4, 9, 19, 20 | Ongoing |

| | | | | |
|---|---|---|---|---|
| | Eliminate Fish-passage barrier culverts on Pine Creek. | Remove culvert at trailer driveway. Install rock weirs and juniper rootwads as needed for erosion control. | 6, 8, 10, 11 | Completed in FY02 |
| | | Replace culvert at Clarno Rd with an appropriately sized and placed bottomless arch structure. | 6, 8, 10, 11 | FY03 |
| | | Replace culvert at Robinson Canyon with an appropriately sized and placed bottomless arch structure. | 6, 8, 10, 11 | FY04 |
| | Reduce incidence of trespass livestock. | Monitor for livestock, work with neighbors to reduce trespass problems. | 15, 16 | Ongoing |
| | | Provide River Valley Farms 50% cost-share for construction of fence on new boundary after mutual land exchange | 15, 16 | FY03 |
| | Reduce erosion caused by management roads. | Install drainage dips as needed to maintain road and reduce erosion on 20 miles of Jennies Peak Rd. | 5, 6, 10 | FY04 |
| | | Rehabilitate closed roads, including obstructing with felled juniper and re-seeding as necessary. | 1, 2, 3, 5, 6, 7, 9, 10, 13, 14, 18 | Ongoing |
| | Return all water rights to permanent instream rights. | Utilize Pine Creek and John Day River water rights as needed on a temporary basis to support restoration plantings. Complete permanent instream lease of all water rights by 2012. | 5, 6, 7, 8, 9, 10 | 10 |
| | Achieve mutual land exchange with BLM | Consolidate ranch habitat and facilitate management. | 13, 14, 15, 16, 17, 18, 21, 22 | Until completed |
| | Maintain ranch facilities. | Maintain buildings and property used to achieve management objectives. | All | Ongoing |
| Maintain public support for watershed and wildlife habitat conservation. | Continue implementation of tribal and public access program. | Maintain informational signs and posted boundaries; provide informational brochures, maps, and regulations. | | Ongoing |
| | | Patrol ranch property and work with OSP to reduce poaching and trespass incidents. | | Ongoing |

| | | | | |
|---|---|---|---|---|
| | Support natural history and conservation education. | Work with local education groups and communicate the goals of the Tribes and BPA. | 24 | Ongoing |
| | Assist with local watershed and habitat projects. | Work cooperatively with Wheeler SWCD and other agencies supporting watershed and wildlife projects in the local area | | Ongoing |

## APPENDIX C. PINE CREEK CONSERVATION AREA PLANT SPECIES LIST.

Draft October 2003.

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| | | | | **Native Trees, Shrubs, and Vines** | | | | | |
| 1 | Betulaceae | Alnus | incana | mountain alder | N | P | T | 1 | |
| 2 | Betulaceae | Alnus | rhombifolia | white alder | N | P | T | 1 | |
| 3 | Betulaceae | Betula | occidentalis | water birch | N | P | T | 1 | |
| 4 | Cupressaceae | Juniperus | occidentalis | western juniper | N | P | T | 1 | |
| 5 | Pinaceae | Pinus | ponderosa | ponderosa pine | N | P | T | 1 | |
| 6 | Pinaceae | Pseudotsuga | menziesii | Douglas fir | N | P | T | 1 | |
| 7 | Rosaceae | Prunus | emarginata | bittercherry | N | P | T | 1 | |
| 8 | Rosaceae | Prunus | virginiana | chokecherry | N | P | T | 1 | |
| 9 | Salicaceae | Populus | tremuloides | aspen | N | P | T | 1 | |
| 10 | Salicaceae | Populus | balsamifera ssp. trichocarpa | black cottonwood | N | P | T | 1 | |
| 11 | Ulmaceae | Celtis | reticulata | hackberry | N | P | T | 1 | |
| 12 | Anacardiaceae | Toxicodendron | rydbergii | poison-ivy | N | P | S | 1 | |
| 13 | Berberidaceae | Mahonia | repens | creeping Oregon grape | N | P | S | 1 | |
| 14 | Caprifoliaceae | Sambucus | nigra ssp. cerulea | blue elderberry | N | P | S | 1 | |
| 15 | Caprifoliaceae | Symphoricarpus | albus | snowberry | N | P | S | 1 | |
| 16 | Chenopodiaceae | Atriplex | canescens | saltbush | N | P | S | 1 | |
| 17 | Chenopodiaceae | Atriplex | confertifolia | shadscale | N | P | S | 1 | |
| 18 | Chenopodiaceae | Eurotia | lanata | winterfat | N | P | S | | 1 |
| 19 | Chenopodiaceae | Grayia | spinosa | spiny hopsage | N | P | S | | 1 |
| 20 | Chenopodiaceae | Sarcobatus | vermiculatus | black greasewood | N | P | S | 1 | |
| 21 | Compositae | Artemisia | arbuscula | low sagebrush | N | P | S | | 1 |
| 22 | Compositae | Artemisia | rigida | stiff sagebrush | N | P | S | 1 | |
| 23 | Compositae | Artemisia | tridentata | big sagebrush | N | P | S | 1 | |
| 24 | Compositae | Chrysothamnus | viscidiflorus | green rabbitbrush | N | P | S | 1 | |
| 25 | Compositae | Ericameria | nauseosa | gray rabbitbrush | N | P | S | 1 | |
| 26 | Compositae | Gutierrezia | sarothrae | matchbrush | N | P | S | 1 | |
| 27 | Compositae | Haplopappus | macronema | discoid goldenwwed | N | P | S | | 1 |
| 28 | Compositae | Haplopappus | resinosus | gnarled goldenweed | N | P | S | 1 | |
| 29 | Compositae | Tetradymia | canescens | spineless horsebrush | N | P | S | 1 | |
| 30 | Cornaceae | Cornus | sericea ssp. Sericea | creek dogwood | N | P | S | 1 | |
| 31 | Ericaceae | Phyllodoce | ssp. | heather | N | P | S | | 1 |
| 32 | Ericaceae | Vaccinium | membranaceum | thin-leaved huckleberry | N | P | S | | 1 |
| 33 | Ericaceae | Vaccinium | scoparium | grouseberry | N | P | S | | 1 |
| 34 | Grossulariaceae | Ribes | aureum | golden currant | N | P | S | 1 | |
| 35 | Grossulariaceae | Ribes | cereum | wax currant | N | P | S | 1 | |
| 36 | Grossulariaceae | Ribes | oxyacanthoides | Umatilla gooseberry | N | P | S | | 1 |
| 37 | Grossulariaceae | Ribes | inerme | whitestem gooseberry | N | P | S | | 1 |
| 38 | Grossulariaceae | Ribes | niveum | snow gooseberry | N | P | S | 1 | |
| 39 | Hydrangeaceae | Philadelphus | lewisii | mockorange | N | P | S | 1 | |
| 40 | Labiatae | Salvia | dorrii | purple sage | N | P | S | 1 | |
| 41 | Polemociaceae | Leptodactylon | pungens | granite prickly phlox | N | P | S | 1 | |
| 42 | Polygonaceae | Eriogonum | heracleiodes | Wyeth buckwheat | N | P | S | 1 | |
| 43 | Polygonaceae | Eriogonum | microthecum | slenderbush buckwheat | N | P | S | 1 | |
| 44 | Rosaceae | Amelanchier | alnifolia | serviceberry | N | P | S | 1 | |
| 45 | Rosaceae | Cercocarpus | ledifolius | curl-leaf mountain mahogany | N | P | S | 1 | |
| 46 | Rosaceae | Crataegus | columbiana | Columbia hawthorn | N | P | S | | 1 |
| 47 | Rosaceae | Crataegus | douglasii | Douglas' hawthorn | N | P | S | 1 | |
| 48 | Rosaceae | Holodiscus | discolor | ocean-spray | N | P | S | 1 | |

# Appendix C: Pine Creek Conservation Area Plant Species List

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| 49 | Rosaceae | Holodiscus | dumosus | dwarf ocean-spray | N | P | S | 1 | |
| 50 | Rosaceae | Peraphyllum | ramosissimum | squaw apple | N | P | S | | 1 |
| 51 | Rosaceae | Purshia | tridentata | bitterbrush | N | P | S | 1 | |
| 52 | Rosaceae | Rosa | woodsii var. ultramontana | Woods' rose | N | P | S | 1 | |
| 53 | Salicaceae | Salix | amygdaloides | peach-leaf willow | N | P | S | 1 | |
| 54 | Salicaceae | Salix | exigua | coyote willow | N | P | S | 1 | |
| 55 | Salicaceae | Salix | lasiolepis | arroyo willow | N | P | S | 1 | |
| 56 | Salicaceae | Salix | lucida ssp. caudata | greenleaf willow | N | P | S | 1 | |
| 57 | Salicaceae | Salix | melanopsis | dusky willow | N | P | S | 1 | |
| 58 | Salicaceae | Salix | monochroma | onecolor willow | N | P | S | 1 | |
| 59 | Ranunculaceae | Clematis | ligusticifolia | western clematis | N | P | V | 1 | |

## Native Graminoids

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Cyperaceae | Carex | amplifolia | bigleaf sedge | N | P | G | 1 | |
| 2 | Cyperaceae | Carex | angustata | wide-fruit sedge | N | P | G | | 1 |
| 3 | Cyperaceae | Carex | geyeri | elk sedge | N | P | G | | 1 |
| 4 | Cyperaceae | Carex | hystricina | porcupine sedge | N | P | G | 1 | |
| 5 | Cyperaceae | Carex | nebrascensis | Nebraska sedge | N | P | G | | 1 |
| 6 | Cyperaceae | Carex | sp. | sedge species | N | P | G | 1 | |
| 7 | Cyperaceae | Carex | stipata | sawbeak sedge | N | P | G | | 1 |
| 8 | Cyperaceae | Cyperus | squarrosus | flatsedge | N | P | G | | 1 |
| 9 | Cyperaceae | Eleocharis | palustris | creeping spike-rush | N | P | G | 1 | |
| 10 | Cyperaceae | Schoenoplectus | americanus | American bulrush | N | P | G | 1 | |
| 11 | Cyperaceae | Schoenoplectus | tabernaemontani | softstem bulrush | N | P | G | | 1 |
| 12 | Cyperaceae | Scirpus | acutus | hardstem bulrush | N | P | G | | 1 |
| 13 | Cyperaceae | Scirpus | olneyi | Olney's bulrush | N | P | G | | 1 |
| 14 | Juncaceae | Juncus | balticus | baltic rush | N | P | G | | 1 |
| 15 | Juncaceae | Juncus | bufonius | toadrush | N | P | G | | 1 |
| 16 | Juncaceae | Juncus | ensifolius | swordleaf rush | N | P | G | 1 | |
| 17 | Juncaceae | Juncus | torreyi | Torrey's rush | N | P | G | | 1 |
| 18 | Juncaceae | Juncus | tenuis | field rush | N | P | G | 1 | |
| 19 | Poaceae | Achnatherum | hymenoides | Indian ricegrass | N | P | G | 1 | |
| 20 | Poaceae | Achnatherum | thurberianum | Thurber's needlegrass | N | P | G | 1 | |
| 21 | Poaceae | Agrostis | stolonifera | redtop | N | P | G | 1 | |
| 22 | Poaceae | Bromus | ciliatus | fringed brome | N | P | G | | 1 |
| 23 | Poaceae | Danthonia | californica | California oatgrass | N | P | G | 1 | |
| 24 | Poaceae | Distichlis | spicata | alkali saltgrass | N | P | G | 1 | |
| 25 | Poaceae | Elymus | trachycaulus | slender wheatgrass | N | P | G | | 1 |
| 26 | Poaceae | Elymus | glaucus | blue wildrye | N | P | G | 1 | |
| 27 | Poaceae | Elymus | elymoides | bottlebrush squirreltail | N | P | G | 1 | |
| 28 | Poaceae | Festuca | idahoensis | Idaho fescue | N | P | G | 1 | |
| 29 | Poaceae | Glyceria | striata | tall mannagrass | N | P | G | 1 | |
| 30 | Poaceae | Hesperostipa | comata | needle-and-thread | N | P | G | 1 | |
| 31 | Poaceae | Koeleria | macrantha | prairie Junegrass | N | P | G | 1 | |
| 32 | Poaceae | Leymus | cinereus | basin wildrye | N | P | G | 1 | |
| 33 | Poaceae | Muhlenbergia | asperifolia | rough-leaved dropseed | N | P | G | 1 | |
| 34 | Poaceae | Phragmites | australis | common reed | N | P | G | 1 | |
| 35 | Poaceae | Poa | secunda | Sandberg's bluegrass | N | P | G | 1 | |
| 36 | Poaceae | Pseudoroegneria | spicata | bluebunch wheatgrass | N | P | G | 1 | |
| 37 | Poaceae | Puccinellia | lemmonii | alkali grass | N | P | G | | 1 |
| 38 | Poaceae | Sporobolus | airodes | alkali sacaton | N | P | G | | 1 |
| 39 | Poaceae | Sporobolus | cryptandrus | sand dropseed | N | P | G | 1 | |
| 40 | Poaceae | Vulpia | microstachys | annual fescue | N | A | G | 1 | |
| 41 | Sparganiaceae | Sparganium | emersum | simplestem bur-reed | N | P | G | | 1 |

# Appendix C: Pine Creek Conservation Area Plant Species List

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| 42 | Typhaceae | Typha | latifolia | cat-tail | N | P | G | 1 | |

## Native Forbs

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Aizoaceae | Mollugo | verticillata | carpetweed | N | A | F | | 1 |
| 2 | Alismataceae | Sagittaria | cuneata | arumleaf arrowhead | N | P | F | | 1 |
| 3 | Amaranthaceae | Amaranthus | albus | tumble pigweed | N | A | F | 1 | |
| 4 | Amaranthaceae | Amaranthus | retroflexus | pigweed amaranth | N | A | F | 1 | |
| 5 | Apacynaceae | Apocynum | androsaemifolium | spreading dogbane | N | P | F | 1 | |
| 6 | Apacynaceae | Apocynum | cannibinum | hemp dogbane | N | P | F | | 1 |
| 7 | Asclepiadaceae | Asclepias | fascicularis | narrow-leaved milkweed | N | P | F | 1 | |
| 8 | Asclepiadaceae | Asclepias | speciosa | showy milkweed | N | P | F | 1 | |
| 9 | Boraginaceae | Amsinckia | menziesii var. intermedia | common fiddleneck | N | A | F | 1 | |
| 10 | Boraginaceae | Amsinckia | tesselata | tesselate fiddleneck | N | A | F | 1 | |
| 11 | Boraginaceae | Cryptantha | affinis | slender cryptantha | N | A | F | | 1 |
| 12 | Boraginaceae | Cryptantha | flaccida | weakstem cryptantha | N | P | F | 1 | |
| 13 | Boraginaceae | Cryptantha | propria | Malheur cryptantha | N | A | F | 1 | |
| 14 | Boraginaceae | Cryptantha | pterocarya | winged cryptantha | N | P | F | 1 | |
| 15 | Boraginaceae | Lithospermum | ruderale | Columbia puccoon | N | P | F | 1 | |
| 16 | Boraginaceae | Myosotis | discolor | changing forget-me-not | N | A | F | 1 | |
| 17 | Cactaceae | Opuntia | fragilis | brittle cactus | N | P | F | 1 | |
| 18 | Cactaceae | Opuntia | polyacantha | prickly pear | N | P | F | | 1 |
| 19 | Cactaceae | Pediocactus | simpsonii | hedgehog-cactus | N | P | F | 1 | |
| 20 | Capparidaceae | Cleome | platycarpa | golden cleome | N | A | F | 1 | |
| 21 | Chenopodiaceae | Chenopodium | leptophyllum | narrowleaf goosefoot | N | A | F | 1 | |
| 22 | Chenopodiaceae | Monolepsis | nuttalliana | patata | N | A | F | | 1 |
| 23 | Compositae | Achillea | millefolium | yarrow | N | P | F | 1 | |
| 24 | Compositae | Agoseris | glauca | pale agoseris | N | P | F | 1 | |
| 25 | Compositae | Agoseris | heterophylla | annual agoseris | N | A | F | 1 | |
| 26 | Compositae | Anaphalis | margaritacea | pearly-everlasting | N | P | F | 1 | |
| 27 | Compositae | Antennaria | dimorpha | low pussy-toes | N | P | F | 1 | |
| 28 | Compositae | Antennaria | luzuloides | woodrush pussytoes | N | P | F | 1 | |
| 29 | Compositae | Antennaria | microphylla | littleleaf pussytoes | N | P | F | 1 | |
| 30 | Compositae | Arnica | cordifolia | heart-leaved arnica | N | P | F | 1 | |
| 31 | Compositae | Artemisia | ludoviciana | western mugwort | N | P | F | 1 | |
| 32 | Compositae | Aster | modestus | few-flowered aster | N | P | F | | 1 |
| 33 | Compositae | Balsomorhiza | sagittata | arrow-leaf balsamroot | N | P | F | 1 | |
| 34 | Compositae | Balsomorhiza | serrata | serrate balsamroot | N | P | F | 1 | |
| 35 | Compositae | Bidens | cernua | beggars-ticks | N | A | F | | 1 |
| 36 | Compositae | Blepharipappus | scaber | blepharipappus | N | A | F | 1 | |
| 37 | Compositae | Chaenactis | douglasii | hoary chaenactis | N | P | F | 1 | |
| 38 | Compositae | Chaenactis | nevii | John Day chaenactis | N | P | F | | 1 |
| 39 | Compositae | Cirsium | undulatum | wavy-leaved thistle | N | B | F | 1 | |
| 40 | Compositae | Conyza | canadensis | horseweed | N | A | F | 1 | |
| 41 | Compositae | Conyza | canadensis | horseweed | N | P | F | 1 | |
| 42 | Compositae | Coreopsis | atkinsoniana | Columbia coreopsis | N | A | F | | 1 |
| 43 | Compositae | Crepis | acuminata | long-leaved hawksbeard | N | P | F | 1 | |
| 44 | Compositae | Crepis | atribarba | slender hawksbeard | N | P | F | 1 | |
| 45 | Compositae | Crepis | intermedia | gray hawksbeard | N | P | F | 1 | |
| 46 | Compositae | Crepis | occidentalis | western hawksbeard | N | P | F | 1 | |
| 47 | Compositae | Crocidium | multicaule | spring gold | N | A | F | | 1 |
| 48 | Compositae | Erigeron | annuus | annual fleabane | N | A | F | | 1 |
| 49 | Compositae | Erigeron | filifolius | thread-leaf fleabane | N | P | F | 1 | |
| 50 | Compositae | Erigeron | foliosus | leafy fleabane | N | P | F | 1 | |
| 51 | Compositae | Erigeron | linearis | linear-leaved daisy | N | P | F | 1 | |

# Appendix C: Pine Creek Conservation Area Plant Species List

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| 52 | Compositae | Erigeron | philadelphicus | Philadelphia fleabane | N | P | F | 1 | |
| 53 | Compositae | Eriophyllum | lanatum | wooly sunflower | N | P | F | 1 | |
| 54 | Compositae | Euthamia | occidentalis | western goldenrod | N | P | F | 1 | |
| 55 | Compositae | Gaillardia | aristata | blanket flower | N | P | F | 1 | |
| 56 | Compositae | Gnaphalium | palustre | lowland cudweed | N | A | F | 1 | |
| 57 | Compositae | Grindelia | nana | low gumweed | N | A | F | 1 | |
| 58 | Compositae | Haplopappus | armerioides | thrift goldenweed | N | P | F | | 1 |
| 59 | Compositae | Haplopappus | stenophyllus | narrow-leaf goldenweed | N | P | F | | 1 |
| 60 | Compositae | Helianthus | annuus | common sunflower | N | A | F | 1 | |
| 61 | Compositae | Helianthus | cusickii | Cusick's sunflower | N | P | F | 1 | |
| 62 | Compositae | Helianthus | nuttalii | Nuttall's sunflower | N | P | F | 1 | |
| 63 | Compositae | Heterotheca | oregana | Oregon goldaster | N | P | F | 1 | |
| 64 | Compositae | Hieracium | albiflorum | white hawkweed | N | P | F | | 1 |
| 65 | Compositae | Hieracium | cynoglossoides | houndstongue hawkweed | N | P | F | 1 | |
| 66 | Compositae | Hymenopappus | filifolius | Columbia cut-leaf | N | P | F | | 1 |
| 67 | Compositae | Iva | axillaris | poverty-weed | N | P | F | | 1 |
| 68 | Compositae | Iva | xanthifolia | tall marsh-elder | N | A | F | 1 | |
| 69 | Compositae | Lactuca | serriola | tall blue lettuce | N | A | F | | 1 |
| 70 | Compositae | Lagophylla | ramosissima | slender hareleaf | N | A | F | | 1 |
| 71 | Compositae | Layia | glandulosa | tidytips | N | A | F | 1 | |
| 72 | Compositae | Machaerantha | canescens | hoary aster | N | A | F | 1 | |
| 73 | Compositae | Madia | gracilis | common tarweed | N | A | F | | 1 |
| 74 | Compositae | Nothocalais | troximoides | false agoseris | N | P | F | 1 | |
| 75 | Compositae | Packera | cana | wooly groundsel | N | P | F | 1 | |
| 76 | Compositae | Senecio | serra | butterweed groundsel | N | P | F | 1 | |
| 77 | Compositae | Solidago | canadensis | Canada goldenrod | N | P | F | | 1 |
| 78 | Compositae | Solidago | missouriensis | Missouri goldenrod | N | P | F | 1 | |
| 79 | Compositae | Solidago | occidentalis | western goldenrod | N | P | F | 1 | |
| 80 | Compositae | Stephanomeria | minor | narrow-leaved skeletonweed | N | P | F | | 1 |
| 81 | Compositae | Uropappus | lindleyi | Lindley's silverpuffs | N | A | F | 1 | |
| 82 | Compositae | Xanthium | strumarium | common cocklebur | N | A | F | 1 | |
| 83 | Crassulaceae | Sedum | lanceolatum | lanceleaved stonecrop | N | P | F | 1 | |
| 84 | Crassulaceae | Sedum | stenopetalum | wormleaf stonecrop | N | P | F | 1 | |
| 85 | Cruciferae | Arabis | cusickii | Cusick's rockcress | N | | F | 1 | |
| 86 | Cruciferae | Arabis | holboellii | Holboell's rockcress | N | | F | 1 | |
| 87 | Cruciferae | Arabis | sparsiflora or lemmonii | rockcress | N | | F | 1 | |
| 88 | Cruciferae | Cardamine | pennsylvanica | Pennsylvania bittercress | N | P | F | | 1 |
| 89 | Cruciferae | Descurainia | pinnata | tansy mustard | N | A | F | | 1 |
| 90 | Cruciferae | Descurainia | incana | mountain tansy mustard | N | A | F | 1 | |
| 91 | Cruciferae | Erysimum | capitatum | prairie rocket | N | B | F | | 1 |
| 92 | Cruciferae | Erysimum | inconspicuum | small wallflower | N | B | F | 1 | |
| 93 | Cruciferae | Idahoa | scapigera | scalepod | N | A | F | 1 | |
| 94 | Cruciferae | Lesquerella | occidentalis | western bladderpod | N | P | F | 1 | |
| 95 | Cruciferae | Phoenicaulis | cheiranthoides | daggerpod | N | P | F | 1 | |
| 96 | Cruciferae | Physaria | oregona | Oregon twinpod | N | P | F | 1 | |
| 97 | Cruciferae | Thelypodium | laciniatum | thickleaved thelypody | N | B | F | 1 | |
| 98 | Cruciferae | Thysanocarpus | curvipes | sand fringepod | N | A | F | 1 | |
| 99 | Ericaceae | Pterospora | andromedea | woodland pinedrops | N | A | F | | 1 |
| 100 | Euphorbiaceae | Chamaesyce | serpyllifolia | thyme-leaf spurge | N | A | F | | 1 |
| 101 | Euphorbiaceae | Euphorbia | glyptosperma | ridge-seeded spurge | N | A | F | | 1 |
| 102 | Gentianaceae | Centaurium | exaltum | western centaury | N | A | F | | 1 |
| 103 | Geraniaceae | Geranium | viscosissimum | sticky purple geranium | N | P | F | | 1 |
| 104 | Hydrophyllaceae | Hydrophyllum | capitatum | ballhead waterleaf | N | P | F | 1 | |
| 105 | Hydrophyllaceae | Phacelia | hastata | whiteleaf phacelia | N | P | F | 1 | |
| 108 | Hydrophyllaceae | Phacelia | linearis | narrow-leafed phacelia | N | A | F | 1 | |
| 109 | Hydrophyllaceae | Phacelia | lutea | yellow phacelia | N | A | F | | 1 |

# Appendix C: Pine Creek Conservation Area Plant Species List

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| 110 | Hydrophyllaceae | Phacelia | ramosissima | branched phacelia | N | P | F | | 1 |
| 111 | Iridaceae | Iris | missouriensis | iris | N | P | F | 1 | |
| 112 | Iridaceae | Olsyinium | douglasii v. inflatum | grass widow | N | P | F | 1 | |
| 113 | Labiatae | Agastache | urticifolia | nettle-leaved horse-mint | N | P | F | 1 | |
| 114 | Labiatae | Mentha | arvensis | field mint | N | P | F | 1 | |
| 115 | Labiatae | Mentha | spicata | spearmint | N | P | F | 1 | |
| 116 | Labiatae | Prunella | vulgaris | self-heal | N | P | F | | 1 |
| 117 | Labiatae | Scutellaria | angustifolia | narrow-leaved skullcap | N | P | F | 1 | |
| 118 | Leguminosae | Astragalus | collinus | hillside milkvetch | N | P | F | 1 | |
| 119 | Leguminosae | Astragalus | conjunctus | stiff milkvetch | N | P | F | 1 | |
| 120 | Leguminosae | Astragalus | diaphanous | John Day milkvetch | N | A | F | | 1 |
| 121 | Leguminosae | Astragalus | filipes | basalt milkvetch | N | P | F | 1 | |
| 122 | Leguminosae | Astragalus | lentiginosus | freckled milkvetch | N | P | F | 1 | |
| 123 | Leguminosae | Astragalus | misellus | pauper milkvetch | N | P | F | 1 | |
| 124 | Leguminosae | Astragalus | purshii | wooly-pod milkvetch | N | P | F | 1 | |
| 125 | Leguminosae | Astragalus | whitneyii | balloon milkvetch | N | P | F | 1 | |
| 126 | Leguminosae | Dalea | ornata | western prairie-clover | N | P | F | 1 | |
| 127 | Leguminosae | Glycyrrhiza | lepidota | licorice | N | P | F | 1 | |
| 128 | Leguminosae | Lathyrus | rigidus | stiff peavine | N | P | F | 1 | |
| 129 | Leguminosae | Lupinus | caudatus | tailcup lupine | N | P | F | 1 | |
| 130 | Leguminosae | Lupinus | lepidus | Pacific lupine | N | P | F | 1 | |
| 131 | Leguminosae | Lupinus | saxosus | rock lupine | N | P | F | 1 | |
| 132 | Leguminosae | Vicia | americana | American vetch | N | P | F | 1 | |
| 133 | Lemnaceae | Lemna | minor | water lentil | N | P | F | 1 | |
| 134 | Lemnaceae | Spirodela | polyrhiza | great duckweed | N | P | F | | 1 |
| 135 | Liliaceae | Allium | acuminatum | Hooker's onion | N | P | F | 1 | |
| 136 | Liliaceae | Allium | tolmiei | Tolmie's onion | N | P | F | 1 | |
| 137 | Liliaceae | Brodiaea | douglasii | Douglas' brodiaea | N | P | F | 1 | |
| 138 | Liliaceae | Calochortus | macrocarpus | sagebrush mariposa | N | P | F | 1 | |
| 139 | Liliaceae | Erythronium | grandiflorum | pale fawn-lily | N | P | F | | 1 |
| 140 | Liliaceae | Fritillaria | pudica | yellow bell | N | P | F | 1 | |
| 141 | Liliaceae | Smilacina | racemosa | western Solomon-plume | N | P | F | 1 | |
| 142 | Liliaceae | Veratrum | californicum | California false hellebore | N | P | F | | 1 |
| 143 | Liliaceae | Zigadenus | paniculatus | panicled death-camas | N | P | F | | 1 |
| 144 | Linaceae | Linum | perenne | wild blue flax | N | P | F | 1 | |
| 145 | Loasaceae | Mentzelia | albicaulis | small-flowered blazing-star | N | A | F | | 1 |
| 146 | Loasaceae | Mentzelia | laevicaulis | blazing-star | N | P | F | 1 | |
| 147 | Malvaceae | Sphaeralcea | grossularifolia | gooseberryleaf globemallow | N | P | F | 1 | |
| 148 | Malvaceae | Sphaeralcea | munroana | white-stemmed globemallow | N | P | F | 1 | |
| 149 | Onagraceae | Camissonia | tanacetifolia | tansy-leaved evening-primrose | N | A | F | | 1 |
| 150 | Onagraceae | Clarkia | pulchella | deer horn | N | A | F | 1 | |
| 151 | Onagraceae | Clarkia | rhomboidea | common clarkia | N | A | F | | 1 |
| 152 | Onagraceae | Epilobium | minutum | small-flowered willow-herb | N | A | F | | 1 |
| 153 | Onagraceae | Epilobium | ciliatum | Watson's willow-herb | N | A | F | 1 | |
| 154 | Onagraceae | Oenothera | caespitosa | desert evening-primrose | N | A | F | | 1 |
| 155 | Onagraceae | Oenothera | elata ssp. Hirsutissima | Hooker's evening-primrose | N | A | F | 1 | |
| 156 | Orchidaceae | Habenaria | dilatata | white bog-candle | N | P | F | | 1 |
| 157 | Orobanchaceae | Orobanche | fasciculata | Clustered broomrape | N | P | F | 1 | |
| 158 | Orobanchaceae | Orobanche | uniflora | naked broomrape | N | P | F | 1 | |
| 159 | Paeoniaceae | Paeonia | brownii | Brown's peony | N | P | F | 1 | |
| 160 | Plantaginaceae | Plantago | major | common plantain | N | P | F | | 1 |
| 161 | Polemoniaceae | Collomia | grandiflora | large-flowered collomia | N | A | F | 1 | |
| 162 | Polemoniaceae | Collomia | linearis | narrow-leaved collomia | N | A | F | | 1 |
| 163 | Polemoniaceae | Navarretia | divaricata | mountain navarretia | N | A | F | | 1 |
| 164 | Polemoniaceae | Phlox | gracilis | slender phlox | N | A | F | 1 | |
| 165 | Polemoniaceae | Phlox | hoodii | Hood's phlox | N | P | F | 1 | |

# Appendix C: Pine Creek Conservation Area Plant Species List

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| 166 | Polemoniaceae | Phlox | hoodii | moss phlox | N | P | F | 1 | |
| 167 | Polemoniaceae | Phlox | viscida | sticky phlox | N | P | F | 1 | |
| 168 | Polemoniaceae | Polemonium | micranthum | annual polemonium | N | A | F | 1 | |
| 169 | Polygonaceae | Eriogonum | baileyi | Bailey's buckwheat | N | A | F | | 1 |
| 170 | Polygonaceae | Eriogonum | compositum | northern buckwheat | N | P | F | 1 | |
| 171 | Polygonaceae | Eriogonum | elatum | tall buckwheat | N | P | F | 1 | |
| 172 | Polygonaceae | Eriogonum | sphaerocephalum | round-headed eriogonum | N | P | F | 1 | |
| 173 | Polygonaceae | Eriogonum | strictum | strict buckwheat | N | P | F | 1 | |
| 174 | Polygonaceae | Eriogonum | umbellatum | sulfur-flower buckwheat | N | P | F | 1 | |
| 175 | Polygonaceae | Eriogonum | vimineum | broom buckwheat | N | A | F | 1 | |
| 176 | Polygonaceae | Polygonum | amphibium | water smartweed | N | P | F | | 1 |
| 177 | Polygonaceae | Polygonum | coccineum | water smartweed | N | P | F | | 1 |
| 178 | Polygonaceae | Polygonum | hydropiper | smartweed | N | A | F | | 1 |
| 179 | Polygonaceae | Polygonum | sawatchense | sawatch knotweed | N | P | F | | 1 |
| 180 | Polygonaceae | Rumex | venosus | veiny dock | N | P | F | 1 | |
| 181 | Portulacaceae | Claytonia | perfoliata | miner's lettuce | N | A | F | 1 | |
| 182 | Portulacaceae | Lewisia | rediviva | bitterroot | N | P | F | 1 | |
| 183 | Potamgetonaceae | Potamogeton | natans | broad-leaved pondweed | N | P | F | 1 | |
| 184 | Primulaceae | Dodecatheon | conjugens | Bonneville shootingstar | N | P | F | 1 | |
| 185 | Ranunculaceae | Aconitum | columbianum | Columbian monkshood | N | P | F | | 1 |
| 186 | Ranunculaceae | Actaea | rubra | western baneberry | N | P | F | | 1 |
| 187 | Ranunculaceae | Aquilegia | formosa | red columbine | N | P | F | 1 | |
| 188 | Ranunculaceae | Delphinium | barbeyi | tall larkspur | N | P | F | 1 | |
| 189 | Ranunculaceae | Delphinium | bicolor | little larkspur | N | P | F | 1 | |
| 190 | Ranunculaceae | Ranunculus | aquatilis | water buttercup | N | P | F | 1 | |
| 191 | Ranunculaceae | Ranunculus | glaberrimus | sagebrush buttercup | N | P | F | 1 | |
| 192 | Ranunculaceae | Ranunculus | sceleratus | celery-leaved buttercup | N | A | F | 1 | |
| 193 | Ranunculaceae | Ranunculus | uncinatus | hooked buttercup | N | P | F | 1 | |
| 194 | Rhamnaceae | Ceanothus | sanguineus | redstem ceanothus | N | P | F | 1 | |
| 195 | Rhamnaceae | Ceanothus | velutinus | mountain balm | N | P | F | | 1 |
| 196 | Rosaceae | Geum | triflorum | old man's whiskers | N | P | F | 1 | |
| 197 | Rosaceae | Potentilla | glandulosa | sticky cinquefoil | N | P | F | 1 | |
| 198 | Rosaceae | Potentilla | gracilis | cinquefoil | N | P | F | 1 | |
| 199 | Rosaceae | Sanguisorba | occidentalis | annual burnet | N | A | F | 1 | |
| 200 | Rubiaceae | Galium | aparine | bedstraw | N | A | F | 1 | |
| 201 | Rubiaceae | Galium | mexicanum ssp. asperrimum | Mexican bedstraw | N | A | F | 1 | |
| 202 | Rubiaceae | Galium | watsonii | shrubby bedstraw | N | A | F | 1 | |
| 203 | Saxifragaceae | Heuchera | cylindrica | alumroot | N | P | F | 1 | |
| 204 | Saxifragaceae | Lithophragma | glabrum | bulbous woodlandstar | N | P | F | 1 | |
| 205 | Saxifragaceae | Lithophragma | parviflorum | smallflower woodlandstar | N | P | F | 1 | |
| 206 | Saxifragaceae | Saxifraga | integrifolia | wholeleaf saxifrage | N | P | F | 1 | |
| 207 | Scrophulariaceae | Castilleja | applegatei | wavy-leaved paintbrush | N | P | F | 1 | |
| 208 | Scrophulariaceae | Castilleja | linariaefolia | narrow-leaved paintbrush | N | P | F | | 1 |
| 209 | Scrophulariaceae | Castilleja | xanthotricha | yellow-hairy indian painbrush | N | P | F | 1 | |
| 210 | Scrophulariaceae | Collinsia | parviflora | small-flowered blue-eyed mary | N | A | F | 1 | |
| 211 | Scrophulariaceae | Mimulus | cusickii | Cusick's monkeyflower | N | A | F | 1 | |
| 212 | Scrophulariaceae | Mimulus | floribundus | purple-stemmed monkeyflower | N | A | F | | 1 |
| 213 | Scrophulariaceae | Mimulus | guttatus | yellow monkeyflower | N | P | F | 1 | |
| 214 | Scrophulariaceae | Mimulus | moschatus | musk flower | N | P | F | | 1 |
| 215 | Scrophulariaceae | Mimulus | nanus | dwarf purple monkeyflower | N | A | F | | 1 |
| 216 | Scrophulariaceae | Mimulus | washingtonensis | Washington monkeyflower | N | A | F | | 1 |
| 217 | Scrophulariaceae | Orthocarpus | sp. | owl-clover | N | A | F | | 1 |
| 218 | Scrophulariaceae | Penstemon | deustus | hot-rock penstemon | N | P | F | 1 | |
| 219 | Scrophulariaceae | Penstemon | eriantherus | fuzzytongue penstemon | N | P | F | 1 | |
| 220 | Scrophulariaceae | Penstemon | richardsonii | Richardson's penstemon | N | P | F | 1 | |
| 221 | Scrophulariaceae | Penstemon | speciosus | royal penstemon | N | P | F | 1 | |

# Appendix C: Pine Creek Conservation Area Plant Species List

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| 222 | Scrophulariaceae | Veronica | americana | American brooklime | N | P | F | 1 | |
| 223 | Scrophulariaceae | Veronica | anagallis-aquatica | water speedwell | N | P | F | 1 | |
| 224 | Scrophulariaceae | Veronica | peregrina | purslane speedwell | N | A | F | | 1 |
| 225 | Scrophulariaceae | Veronica | serpyllifolia | thyme-leaf speedwell | N | P | F | 1 | |
| 226 | Solanaceae | Datura | stramonium | stramonium | N | P | F | | 1 |
| 227 | Solanaceae | Solanum | triflorum | cut-leaved nightshade | N | A | F | | 1 |
| 228 | Umbelliferae | Angelica | dawsonii | Dawson's angelica | N | P | F | 1 | |
| 229 | Umbelliferae | Cicuta | douglasii | western water hemlock | N | P | F | 1 | |
| 230 | Umbelliferae | Heracleum | lanatum | cow parsnip | N | P | F | 1 | |
| 231 | Umbelliferae | Lomatium | cous | cous biscuitroot | N | P | F | 1 | |
| 232 | Umbelliferae | Lomatium | dissectum | fern-leaved lomatium | N | P | F | 1 | |
| 233 | Umbelliferae | Lomatium | gormanii | Gorman's lomatium | N | P | F | 1 | |
| 234 | Umbelliferae | Lomatium | grayi | Gray's lomatium | N | P | F | 1 | |
| 235 | Umbelliferae | Lomatium | bicolor v. leptocarpum | slender-fruited lomatium | N | P | F | 1 | |
| 236 | Umbelliferae | Lomatium | macrocarpum | large-fruited lomatium | N | P | F | 1 | |
| 237 | Umbelliferae | Lomatium | minus | John Day valley desert-parsley | N | P | F | 1 | |
| 238 | Umbelliferae | Lomatium | nudicaule | bare-stem biscuitroot | N | P | F | 1 | |
| 239 | Umbelliferae | Lomatium | triternatum | nine-leaved lomatium | N | P | F | 1 | |
| 240 | Umbelliferae | Osmorhiza | occidentalis | western sweet-cicely | N | P | F | 1 | |
| 241 | Umbelliferae | Perideridia | gairdneri | yampah | N | P | F | 1 | |
| 242 | Urticaceae | Urtica | dioica | stinging nettle | N | P | F | 1 | |
| 243 | Valerianaceae | Plectritis | macrocera | white plectritis | N | A | F | 1 | |
| 244 | Violaceae | Viola | nephrophylla | northern bog violet | N | P | F | 1 | |
| 245 | Violaceae | Viola | nuttallii | yellow prairie violet | N | P | F | 1 | |

## Native Lycopods, Ferns, and Horsetails:

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Polypodiaceae | Cheilanthes | gracillima | lace lip-fern | N | P | C | 1 | |
| 2 | Polypodiaceae | Cryptogramma | acrostichoides | American rockbrake | N | P | C | 1 | |
| 3 | Polypodiaceae | Cystopteris | fragilis | brittle bladder-fern | N | P | C | 1 | |
| 4 | Equisetaceae | Equisetum | arvense | common horsetail | N | A | C | 1 | |
| 5 | Equisetaceae | Equisetum | hyemale | common scouring-rush | N | P | C | | 1 |
| 6 | Equisetaceae | Equisetum | pratense | shady horsetail | N | A | C | | 1 |
| 7 | Equisetaceae | Equisetum | variegatum | variegated horsetail | N | P | C | | 1 |
| 8 | Marsileaceae | Marsilea | vestita | pepperwort | N | | C | 1 | |
| 9 | Polypodiaceae | Polystichum | sp. | sword-fern | N | P | C | 1 | |
| 10 | Selaginellaceae | Selaginella | watsonii | Watson’s club-moss | N | P | C | 1 | |

## Introduced Trees and Shrubs

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Aceraceae | Acer | negundo | box-elder | I | P | T | 1 | |
| 2 | Eleagnaceae | Eleagnus | angustifolia | Russian olive | I | P | T | 1 | |
| 3 | Leguminosae | Robinia | pseudo-acacia | black locust | I | P | T | 1 | |
| 4 | Moraceae | Morus | alba | white mulberry | I | P | T | 1 | |
| 5 | Rosaceae | Pyrus | communis | pear | I | P | T | 1 | |
| 6 | Rosaceae | Pyrus | malus | apple | I | P | T | 1 | |
| 7 | Salicaceae | Populus | alba | white poplar | I | P | T | 1 | |
| 8 | Salicaceae | Populus | nigra v. italica | Lombardy poplar | I | P | T | 1 | |
| 9 | Ulmaceae | Ulmus | pumila | Siberian elm | I | P | T | 1 | |
| 10 | Rosaceae | Rosa | canina | dog rose | I | P | S | | 1 |
| 11 | Rosaceae | Rosa | eglanteria | sweetbriar | I | P | S | 1 | |
| 12 | Rosaceae | Rubus | discolor | Himalayan blackberry | I | P | S | 1 | |
| 13 | Rosaceae | Rubus | laciniatus | evergreen blackberry | I | P | S | 1 | |
| 14 | Solanaceae | Lycium | barbarum | matrimony vine | I | P | S | 1 | |

# Appendix C: Pine Creek Conservation Area Plant Species List

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| **Introduced Graminoids** | | | | | | | | | |
| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
| 1 | Poaceae | Aegilops | cylindrica | jointed goatgrass | I | A | G | 1 | |
| 2 | Poaceae | Agropyron | cristatum | crested wheatgrass | I | P | G | 1 | |
| 3 | Poaceae | Agropyron | repens | quack grass | I | P | G | | 1 |
| 4 | Poaceae | Arrhenatherum | elatius | tall oatgrass | I | P | G | 1 | |
| 5 | Poaceae | Avena | fatua | wild oats | I | A | G | 1 | |
| 6 | Poaceae | Bromus | briziformis | rattlesnake grass | I | A | G | 1 | |
| 7 | Poaceae | Bromus | commutatus | hairy brome | I | A | G | 1 | |
| 8 | Poaceae | Bromus | diandrus | ripgut brome | I | A | G | 1 | |
| 9 | Poaceae | Bromus | japonicus | Japanese brome | I | A | G | 1 | |
| 10 | Poaceae | Bromus | hordeaceus | soft brome | I | A | G | 1 | |
| 11 | Poaceae | Bromus | rubens | foxtail brome | I | A | G | | 1 |
| 12 | Poaceae | Bromus | tectorum | cheatgrass | I | A | G | 1 | |
| 13 | Poaceae | Coleanthus | subtilis | moss-grass | I | A | G | | 1 |
| 14 | Poaceae | Crypsis | alopecuroides | Helechloa | I | A | G | | 1 |
| 15 | Poaceae | Dactylis | glomerata | orchard-grass | I | P | G | 1 | |
| 16 | Poaceae | Echinochloa | crus-galli | barnyardgrass | I | P | G | 1 | |
| 17 | Poaceae | Eragrostis | cilianensis | candy grass | I | A | G | 1 | |
| 18 | Poaceae | Eremopyrum | triticeum | annual wheatgrass | I | A | G | 1 | |
| 19 | Poaceae | Hordeum | murinum | charming barley | I | P | G | 1 | |
| 20 | Poaceae | Hordeum | jubatum | foxtail barley | I | P | G | 1 | |
| 21 | Poaceae | Hordeum | vulgare | cultivated barley | I | A | G | | 1 |
| 22 | Poaceae | Lolium | pratense | meadow fescue | I | P | G | 1 | |
| 23 | Poaceae | Panicum | capillare | witchgrass | I | P | G | | 1 |
| 24 | Poaceae | Pascopyrum | smithii | western wheatgrass | I | P | G | 1 | |
| 25 | Poaceae | Pennisetum | glaucum | yellow bristlegrass | I | A | G | | 1 |
| 26 | Poaceae | Phalaris | arundinacea | reed canarygrass | I | P | G | 1 | |
| 27 | Poaceae | Phleum | pratense | common timothy | I | P | G | 1 | |
| 28 | Poaceae | Poa | bulbosa | bulbous bluegrass | I | P | G | 1 | |
| 29 | Poaceae | Poa | compressa | Canada bluegrass | I | P | G | 1 | |
| 30 | Poaceae | Poa | pratensis | Kentucky bluegrass | I | P | G | 1 | |
| 31 | Poaceae | Polypogon | monospeliensis | rabbitfoot grass | I | A | G | | |
| 32 | Poaceae | Secale | cereale | cereal rye | I | A | G | 1 | |
| 33 | Poaceae | Setaria | viridis | green bristlegrass | I | A | G | | 1 |
| 34 | Poaceae | Taeniatherum | caput-medusae | medusahead | I | A | G | 1 | |
| 35 | Poaceae | Thinopyrum | ponticum | rush wheatgrass | I | P | G | 1 | |
| 36 | Poaceae | Triticum | asperum | cultivated wheat | I | A | G | 1 | |
| 37 | Poaceae | Vulpia | myuros | foxtail fescue | I | A | G | 1 | |
| | | | | | | | | | |
| **Introduced Forbs** | | | | | | | | | |
| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
| 1 | Boraginaceae | Asperugo | procumbens | madwort | I | A | F | 1 | |
| 2 | Boraginaceae | Cynoglossum | officinale | common hounds-tongue | I | B | F | 1 | |
| 3 | Caryophyllaceae | Cerastium | glomeratum | sticky chickweed | I | A | F | 1 | |
| 4 | Caryophyllaceae | Holosteum | umbellatum | jagged chickweed | I | A | F | 1 | |
| 5 | Caryophyllaceae | Saponaria | officinalis | bouncing bet | I | P | F | 1 | |
| 6 | Chenopodiaceae | Bassia | hyssopifolia | bassia | I | A | F | | 1 |
| 7 | Chenopodiaceae | Chenopodium | album | lambsquarter | I | A | F | 1 | |
| 8 | Chenopodiaceae | Chenopodium | botrys | Jerusalem-oak | I | A | F | | 1 |
| 9 | Chenopodiaceae | Kochia | scoparia | mock cypress | I | A | F | 1 | |
| 10 | Chenopodiaceae | Salsola | kali | Russian thistle | I | A | F | 1 | |
| 11 | Compositae | Acroptilon | repens | Russian knapweed | I | P | F | 1 | |
| 12 | Compositae | Ambrosia | tomentosa | skeletonleaf bursage | I | P | F | 1 | |
| 13 | Compositae | Anthemis | cotula | mayweed chamomile | I | A | F | 1 | |

# Appendix C: Pine Creek Conservation Area Plant Species List

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| 14 | Compositae | Arctium | minus | common burdock | I | P | F | 1 | |
| 15 | Compositae | Centaurea | cyanus | bachelor's buttons | I | P | F | | 1 |
| 16 | Compositae | Centaurea | diffusa | diffuse knapweed | I | P | F | 1 | |
| 17 | Compositae | Centaurea | maculosa | spotted knapweed | I | P | F | 1 | |
| 18 | Compositae | Centaurea | solstitialis | yellow star-thistle | I | B | F | 1 | |
| 19 | Compositae | Cichorium | intybus | chicory | I | P | F | 1 | |
| 20 | Compositae | Cirsium | arvense | Canada thistle | I | P | F | 1 | |
| 21 | Compositae | Cirsium | vulgare | bull thistle | I | B | F | 1 | |
| 22 | Compositae | Lactuca | serriola | prickly lettuce | I | A | F | 1 | |
| 23 | Compositae | Onopordum | acanthium | Scotch thistle | I | B | F | 1 | |
| 24 | Compositae | Sonchus | asper | prickly sow-thistle | I | A | F | 1 | |
| 25 | Compositae | Tanacetum | vulgare | common tansy | I | A | F | | 1 |
| 26 | Compositae | Taraxacum | officinale | dandelion | I | P | F | 1 | |
| 27 | Compositae | Tragopogon | dubius | yellow salsify | I | A | F | 1 | |
| 28 | Convolvulaceae | Convolvulus | arvensis | field morning-glory | I | P | F | 1 | |
| 29 | Cruciferae | Alyssum | alyssoides | pale allysum | I | A | F | 1 | |
| 30 | Cruciferae | Camelina | microcarpa | littlepod falseflax | I | A | F | 1 | |
| 31 | Cruciferae | Capsella | bursa-pastoris | shepherd's-purse | I | A | F | 1 | |
| 32 | Cruciferae | Cardaria | draba | whitetop | I | P | F | 1 | |
| 33 | Cruciferae | Chorispora | tenella | blue mustard | I | A | F | 1 | |
| 34 | Cruciferae | Draba | verna | spring whitlow-grass | I | A | F | 1 | |
| 35 | Cruciferae | Lepidium | perfoliatum | clasping pepperweed | I | A | F | 1 | |
| 36 | Cruciferae | Rorippa | nasturtium-aquaticum | water-cress | I | P | F | 1 | |
| 37 | Cruciferae | Sisymbrium | altissimum | tumblemustard | I | A | F | 1 | |
| 38 | Cruciferae | Sisymbrium | loeselii | small tumbleweed mustard | I | A | F | 1 | |
| 39 | Dipsaceae | Dipsacus | sylvestris | teasel | I | B/P | F | 1 | |
| 40 | Geraniaceae | Erodium | cicutarium | filaree | I | A | F | 1 | |
| 41 | Hypericaceae | Hypericum | perforatum | St.John's-wort | I | P | F | 1 | |
| 42 | Labiatae | Lamium | amplexicaule | common hen-bit | I | A | F | 1 | |
| 43 | Labiatae | Marrubium | vulgare | horehound | I | P | F | 1 | |
| 44 | Labiatae | Mentha | piperita | peppermint | I | P | F | | 1 |
| 45 | Labiatae | Nepeta | cararia | catnip | I | P | F | | 1 |
| 46 | Leguminosae | Medicago | lupulina | black medic | I | A | F | 1 | |
| 47 | Leguminosae | Medicago | sativa | alfalfa | I | P | F | 1 | |
| 48 | Leguminosae | Melilotus | officinalis | white sweet-clover | I | B | F | 1 | |
| 49 | Leguminosae | Trifolium | dubium | suckling clover | I | A | F | 1 | |
| 50 | Leguminosae | Trifolium | repens | white clover | I | P | F | 1 | |
| 51 | Liliaceae | Asparagus | officinalis | asparagus | I | P | F | 1 | |
| 52 | Malvaceae | Malva | neglecta | cheeseweed | I | P | F | 1 | |
| 53 | Onagraceae | Epilobium | angustifolium | fireweed | I | A | F | | 1 |
| 54 | Plantaginaceae | Plantago | lanceolata | English plantain | I | P | F | 1 | |
| 55 | Polygonaceae | Rumex | acetosella | sheep sorrel | I | P | F | 1 | |
| 56 | Polygonaceae | Rumex | crispus | curly dock | I | P | F | 1 | |
| 57 | Portulacaceae | Portulaca | oleracea | common purslane | I | A | F | 1 | |
| 58 | Ranunculaceae | Ceratocephala | testiculatus | hornseed buttercup | I | A | F | 1 | |
| 59 | Ranunculaceae | Ranunculus | cymbalaria | shore buttercup | I | P | F | | 1 |
| 60 | Rosaceae | Potentilla | fruticosa | shrubby cinquefoil | I | P | F | | 1 |
| 61 | Scrophulariaceae | Linaria | dalmatica | Dalmatian toadflax | I | P | F | 1 | |
| 62 | Scrophulariaceae | Verbascum | blattaria | moth mullein | I | B | F | 1 | |
| 63 | Scrophulariaceae | Verbascum | thapsus | common mullein | I | B | F | 1 | |
| 64 | Solanaceae | Hyoscyamus | niger | black henbane | I | A | F | | 1 |
| 65 | Solanaceae | Nicotiana | acuminata | wild tobacco | I | A/P | F | 1 | |
| 66 | Solanaceae | Nicotiana | attenuata | coyote tobacco | I | A/P | F | 1 | |
| 67 | Solanaceae | Physalis | longifolia | ground-cherry | I | P | F | | 1 |
| 68 | Solanaceae | Solanum | dulcamara | bittersweet | I | P | F | 1 | |
| 69 | Umbelliferae | Anthriscus | scandicina | bur chervil | I | A | F | 1 | |

# Appendix C: Pine Creek Conservation Area Plant Species List

| | Family | Genus | Species | Common Name | Nat / Int | Ann/ Per | Form | Observed | Expected |
|---|---|---|---|---|---|---|---|---|---|
| 70 | Umbelliferae | Conium | maculatum | poison hemlock | I | P | F | 1 | |
| 71 | Umbelliferae | Daucus | carota | Queen Anne's lace | I | B | F | | 1 |
| 72 | Umbelliferae | Pastinaca | sativa | parsnip | I | P | F | | 1 |
| 73 | Valerianaceae | Valerianella | locusta | European corn-salad | I | A | F | | 1 |
| 74 | Zygophyllaceae | Tribulus | terrestris | puncture-vine | I | A | F | 1 | |

# APPENDIX D. Pine Creek Conservation Area Regulations

## Pine Creek Conservation Area Regulations

Revised February 2004; Will be modified as deemed necessary

The Confederated Tribes of Warm Springs purchased Pine Creek Ranch in 1999 with Bonneville Power Administration Wildlife and Watershed Mitigation funds, and expanded the property in 2001 with acquisition of the Wagner Ranch. The property will be managed in perpetuity for the benefit of wildlife and fish habitat.

**Access is conditioned upon visitors agreeing to comply with these regulations and applicable Oregon and Federal law. Visitors will comply with any directions or instructions given them by Pine Creek Conservation Area employees in the administration of their duties. Visitors will not trespass on neighboring lands. Users failing to comply with these regulations and applicable law are subject to exclusion from the Pine Creek Conservation Area, payment of damages, and prosecution under applicable law.**

**Visitors to the Pine Creek Conservation Area assume the risk inherent with the activities they undertake, whether hunting, horseback riding, hiking, or any other activity. By assuming this risk they agree not to make a claim against or sue the Confederated Tribes or their employees for injuries or damages that they incur as a result of the inherent risks of their visit to Pine Creek Conservation Area.**

### COMMERCIAL USE

All commercial uses – including but not limited to guiding, firewood or other wood products removal, or antler collecting – are prohibited, with exception of prescribed management purposes. All other uses are prohibited unless specifically authorized by Pine Creek Conservation Area management.

### ACCESS

All visitors must sign in and out at registers on Highway 218. Groups of 6 or more may visit by prior arrangement only.

The conservation area may be accessed from public roads (Highway 218, Clarno Rd., or Pine Creek Rd.), the John Day River, or public lands. No public motor vehicle use is allowed on the conservation area.

Neighboring private lands may be used to access the conservation area only with landowner permission. Neighboring landowners may not charge fees to access Pine Creek Conservation Area. Individuals who pay to access or hunt neighboring lands may not access Pine Creek Conservation Area through those lands.

### VEHICLES

Vehicles, ATVs, mountain bikes, or carts are not permitted away from Highway 218, Clarno Rd, or Pine Creek Rd, except for management purposes on conservation area roads.

### HORSES AND/OR OTHER PACK ANIMALS

Horses and other pack animals are not allowed other than for management purposes and by permitted big game hunters (SEE HUNTING).

# Appendix D. Pine Creek Conservation Area Regulations

## HUNTING

A valid Oregon hunting license or tribal identification card and appropriate tag or stamp is required. All hunters are subject to these regulations, and all hunting will be in accordance with tribal, state and federal laws and regulations.
Hunting of any species not specifically designated in these regulations or permits is prohibited.

## SAFETY ZONES

Safety Zones are closed to all hunting. Safety zones are in place around three residences, and on the area north of Highway 218 and west of Cove Creek (for Hancock Field Station and NPS). SEE MAP.

THE SAFETY ZONE AT CLARNO RD NOW INCLUDES THE AREA NEAR THE INFO. SIGN AND SCHOOL BUS STOP.

## HARVEST REPORTING

All harvested birds or game must be reported. Hunters accessing the conservation area from Highway 218 must report harvest when checking-out. Hunters who accessed from the John Day River may report harvest by mail, and must report within one week.

## PREDATOR HUNTING

Predator hunting is NOT permitted.

## FERAL SWINE

Feral swine are known to occur near Pine Creek Conservation Area. All sightings must be reported. Hunters with permits to access the conservation area may also hunt feral swine. Hunters may not access the conservation area with firearms for the purpose of feral swine hunting.

## BIRD HUNTING

The first full week and second weekend of each bird season (1st nine days) will be reserved for youth hunters age 12-17. Youth hunters must possess a valid Hunters Safety card and be accompanied by an adult who shall not carry a weapon.

Hunting is permitted for: Mourning Dove, Chukar, California Quail, Ring-necked Pheasant, and Waterfowl.
Bird hunters must be able to distinguish Mountain Quail from legal game species before shooting.
Non-toxic Shot is recommended for all game bird hunting.

## Advisory Committee:

An Advisory Committee of the individuals listed below annually reviews the Pine Creek Conservation Area Regulations. The Confederated Tribes are sincerely appreciative of the efforts contributed by the committee.

Joseph Jones, Oregon Museum of Science and Industry
Dan Greenfield, local representative
Russ Morgan & Bob Krein, Oregon Department of Fish and Wildlife
Todd Hoodenpyl, Oregon State Police
Terry Luther & Mark Berry, Confederated Tribes of Warm Springs
John Laing, National Park Service
Scott Cooke, Bureau of Land Management
Ted Molinari, local representative

# Appendix D. Pine Creek Conservation Area Regulations

## BIG GAME HUNTING
## BIG GAME HUNTING SPECIAL ACCESS

Big game permit holders may use up to two horses or other pack animals. All feed must be weed-free. Mountain bikes or non-motorized game carts may be used by big game permit holders, but must remain on designated roads (see map), except to retrieve harvested game. Non-permit holders may accompany permit holders, but shall not carry firearms.

## APPLICATION PROCEDURES

Permits will be allocated by lottery. To apply, hunters must submit a photocopy of their tag or tribal ID along with name, mailing address, and phone number. Applications must be RECEIVED by July 31. If any permits are remaining after the drawing, they will be available on a first-come, first-served basis before seasons open. Interested hunters (Tribal or Non-tribal) should apply to: Pine Creek Conservation Area, 39067 Highway 218, Fossil, OR 97830; Phone (541) 489-3477 (NO FAX), Email pinecreek@bendnet.com

## PARTY APPLICANTS

Party applications are limited to three people; only the leader's name will be entered in the drawing. Parties will not be divided.

## BIG GAME PERMITS:

Permits will be mailed to successful applicants with property maps and regulations. Hunters will receive two permits: One must be displayed in their vehicle, and the other must remain in their possession. Hunters must display their permit, license, and tag on demand of anyone on the property. Permitted hunters must sign-in at a check-station on Highway 218, and must sign-out when leaving the area. Permitted hunters intending to access from the John Day River must sign-in at the register on Highway 218, or contact the office, and must sign-out.

BIG GAME HUNT SEASONS AND NUMBER OF PERMITS IN 2004

| SEASON (HUNT #) | HARVEST | GAME UNIT | PERMITS Tribal / Non | DATES |
|---|---|---|---|---|
| General Bow | 1 Buck &/or 1 Elk | Either | 10 / 10 | Aug 28 – Sep 26 |
| Buck Deer Rifle: 145 | 1 Buck | S Fossil | 15 / 15 | Oct 2 – Oct 13 |
| Buck Deer Rifle: 143 | 1 Buck | E. Biggs | 5 / 5 | Oct 2 – Oct 13 |
| Antlerless Deer Rifle: 643A | 1 Antlerless Deer | E. Biggs | 5* / 5 | Oct 16 – Oct 24 |
| *Tribal antlerless deer permits are reserved for ceremonial hunters | | | | |
| Elk 1st Bull Rifle: 245B1 | 1 Bull | S Fossil | 10 / 10 | Oct 27 – Oct 31 |
| Elk 2nd Rifle: 245B2 | 1 Elk | S Fossil | 10 / 10 | Nov 6 – Nov 14 |
| Elk Extended Rifle: R.Mt.Elk1st | 1 Elk | E. Biggs | 3 / 3 | Oct 27 – Nov 21 |
| Elk Antlerless Rifle: 245D1 | 1 Antlerless Elk | S Fossil | 6 / 6 | Nov 20 – Nov 28 |
| Elk Antlerless Rifle: 245D2 | 1 Antlerless Elk | S Fossil | 6 / 6 | Dec 4 – Dec 12 |
| Elk Antlerless Rifle: 245D3 | 1 Antlerless Elk | S Fossil | 6 / 6 | Dec 18 – Dec 26 |

**Contact Information:**

Mark Berry, Habitat Manager — 39067 Highway 218 — pinecreek@bendnet.com
Pine Creek Conservation Area — Fossil, OR 97830 — (541) 489-3477

# Appendix D. Pine Creek Conservation Area Regulations

## FIREARMS

No firearms may be brought onto the conservation area except for permitted hunting purposes.

## CAMPING

All campers will observe a leave no-trace policy. Leave nothing behind and pack out all trash.

VEHICLE ACCESS CAMP:

A primitive campsite at Robinson Canyon is available by permit for educational groups, researchers, volunteers, or management activities. No potable water, electricity, or waste disposal are available. No RVs or campers longer than 30'. During big-game seasons, up to 5 campsites may be provided for permitted hunters at Robinson Canyon. Campers will be responsible for keeping a gate closed and locked while on the property.

BACKCOUNTRY (UPLAND) CAMPS:

Backcountry camps must be at least one mile or farther from public roads. Human waste must be buried.

RIVER CAMPS:

No camping above the mean high water mark within ¼ mile of the John Day River, except on BLM land. All River Camps are subject to BLM Wild and Scenic river regulations, including the use of a portable toilet.

## FIRE RESTRICTIONS

No fires of any kind during seasonally posted FIRE RESTRICTIONS (including campfires, charcoal, wood burning devices). No smoking during fire season except in vehicles. Permitted campers on the conservation area may use portable cooking stoves using liquefied or bottled fuel, or campfires outside of fire season. Call or email to inquire if necessary.

## FISHING

No fishing access to Pine Creek, to protect summer steelhead. Foot access to the John Day River is permitted.

## DOGS

Dogs must be kept under voice and sight control at all times, and may not run at large during bird breeding seasons from April 1 through July 31.

## FOSSIL AND ROCK COLLECTING PROHIBITED

Paleontological resources are protected by applicable law. Researchers may submit proposals.

## CULTURAL RESOURCES

State, federal and tribal laws prohibit the disturbance or removal of cultural resources. Violators are subject to severe criminal and civil penalties. Cultural resources include but are not limited to foods, pottery, basketry, bottles, weapons, weapon projectiles, tools, structures, pit houses, rock paintings, rock carvings, graves, human skeletal materials, or any portion or piece of the foregoing items. Visitors are required to report suspicious activities to conservation area management.

## RESEARCH AND EDUCATIONAL USE

Natural sciences research and educational activities are encouraged. Researchers should contact conservation area management prior to submitting proposals. Educational groups may visit Pine Creek Conservation Area by permit, with restrictions applied as necessary.

# APPENDIX E. 2001 BASELINE HABITAT EVALUATION PROCEDURE (HEP) REPORT*

## Pine Creek Ranch

Mark Berry
Habitat Manager
Pine Creek Ranch
39067 Highway 218
Fossil, OR 97830

## Introduction

Habitat Evaluation Procedure (HEP) is used extensively within the Northwest Power Planning Council's (NPPC) Columbia River Basin Fish and Wildlife Program. Wildlife managers use this procedure to determine habitat lost through the construction of the federal hydro-electric projects and gained through NPPC mitigation program.

The wildlife habitat impacts of constructing John Day Dam on the Columbia River were assessed in 1989 using HEP methods (Rasmussen & Wright, 1989). The project directly impacted 27,455 acres of wildlife habitat. Ten evaluation species were selected, and Habitat Suitability Index (HSI) models for each of the target species were used to determine lost habitat quality and quantity for representative habitat cover types (Table 1). A Habitat Unit (H.U.) is an acre of idealized habitat, and HUs are calculated by multiplying HSI values (ranging from 0.0 to 1.0) times the acreage of a given cover type.

*This Baseline HEP covers the original Pine Creek Ranch acquisition, not including the Wagner parcel. See Section XIX, A.

Table 1. HEP indicator species selected in John Day Pool loss assessment, with acreages of cover types lost to flooding, and total Habitat Units (H.U.s) lost for each species.

| Species: | Cover Types (acres flooded) | | | Total H.U.s lost |
|---|---|---|---|---|
| Western Meadowlark | Shrub/Steppe/Grass (12,647) | | | 5,059 |
| Yellow Warbler | Riparian Shrub (1,085) | | | 1,085 |
| Mink | Riparian Shrub (1,085) | Emergent (511) | | 1,437 |
| California Quail | Shrub/Steppe/Grass (12,647) | | | 6,324 |
| Great Blue Heron | Sand/Gravel (3,983) | | | 3,186 |
| Mallard | Riparian Herbaceous (1,178) | Island (6,708) | Emergent (511) | 7,399 |
| Spotted Sandpiper | Sand/Gravel (3,983) | | | 3,186 |
| Canada Goose | Riparian Herbaceous (1,178) | Island (6,708) | Agriculture (2,062) | 8,010 |
| Black-capped Chickadee | Riparian Tree (1,086) | | | 869 |
| Lesser Scaup | Open Water | | | Gain 14,398 |

In 2001, a HEP team evaluated the baseline habitat conditions on the 24,304-acre Pine Creek Ranch, which is intended to partially mitigate for habitat losses at John Day Dam. The baseline Habitat Units (HU) will be provided as credit to the Bonneville Power Administration (BPA) for protection of habitats within the project.

The 2001 HEP team consisted of the following members and agencies: Mark Berry, Confederated Tribes of Warm Springs (CTWS); Terry Luther, CTWS; Paul Ashley, Washington Dept. of Fish and Wildlife (WDFW); Donna Allard, United States Fish and Wildlife Service (USFWS); Ray Entz, Kalispel Natural Resource Department (KNRD); Darren Holmes, KNRD; Roy Finley, KNRD; Neil Lockwood, KNRD; Susan Barnes, Oregon Department of Fish and Wildlife (ODFW), and Ken Rutherford, ODFW.

**Methods:**

Cover Types:

Pine Creek Ranch was selected as an off-site mitigation project for John Day Pool partially because it includes habitats similar to those that were inundated by John Day Pool. A large portion of the ranch is upland bunchgrass steppe habitat, which is similar to the Shrub/Steppe/Grass cover type, 12, 647 acres of which were lost under John Day

Pool. There also are clear differences between the habitat types on Pine Creek Ranch and those lost under John Day Pool. Especially notable is the lack of large riparian areas with associated islands, sand/gravel bars, riparian forests, and emergent herbaceous vegetation; and the presence of large areas of western juniper, which did not occur at John Day Pool. Cover types on Pine Creek Ranch were mapped by the CTWS in 2000 using Landsat imagery and ERDAS software, with acreages of each cover type calculated (Table 2).

Table 2. Cover Types on Pine Creek Ranch.

| Cover Type | Acres* | Comparable John Day Pool Cover Types |
|---|---|---|
| Grassland | 2,635 | Shrub/Steppe/Grass |
| Agriculture[1] | 242 | Shrub/Steppe/Grass |
| Scattered Juniper | 6,464 | Shrub/Steppe/Grass |
| Moderate Juniper | 7,746 | None |
| Dense Juniper | 4,968 | None |
| Burned Grassland[2] | 399 | Shrub/Steppe/Grass |
| Burned Scat. Juniper[2] | 1,373 | Shrub/Steppe/Grass |
| Burned Mod. Juniper[2] | 1,001 | Shrub/Steppe/Grass |
| Burned Dense Juniper[2] | 297 | Shrub/Steppe/Grass |
| Riparian | 21 | Riparian Shrub |
| TOTAL: | 25,146 | |

*Acres calculated by GIS slightly exceed total acreage of 24,304 acres in legal description of property.

[1] Agriculture cover type includes floodplain fields previously managed for agriculture, but now managed as grasslands.

[2] Areas burned in the July, 2000 Two Horse Fire were mapped separately based upon their prior cover type.

Model Selection:

In an ideal application of HEP to wildlife mitigation, the same cover types would exist at the mitigation site that were lost in the original action, and the same HSI models would be applied at each location. When this is not possible, it is appropriate to apply the same number of HSI models in each cover type.

For the Shrub/Steppe/Grass cover type at John Day Pool, the Western Meadowlark and California Quail models were applied. The Western Meadowlark model was applied at Pine Creek Ranch to all appropriate cover types, but the existing California Quail HSI model was developed for use primarily in an agricultural setting and could not be practicably applied at Pine Creek Ranch. For this reason, a Mule Deer model originally developed by Paul Ashley and Matthew Berger (1999) was modified for use at Pine Creek Ranch. The Mule Deer model was also applied to Moderate and Dense Juniper cover types, which were not included in the original loss assessment.

The riparian habitats along Pine Creek are comparable to the Riparian Shrub cover type at John Day Pool, and the Yellow Warbler and Mink HSI models were used in this cover type.

Models for Western Meadowlark, Mule Deer, Yellow Warbler, and Mink are presented in Appendix A.

The remaining HSI models used at John Day Pool (Great Blue Heron, Mallard, Spotted Sandpiper, Canada Goose, Black-capped Chickadee, and Lesser Scaup) were applied to cover types not present at Pine Creek Ranch.

Site Selection:

Upland cover types on Pine Creek Ranch, especially categories of varying juniper density, occur in a patchy manner, and grade into one another. To avoid biases potentially introduced by field selection of transect locations, the tribal GIS was used to generate a list of coordinates for points located centrally within cover type patches. A subset of these computer-generated sites was selected with consideration for ease of access (all sites within 1 mile of a ranch road), while maintaining a range of aspects, elevation, and geographic position reflective of the distribution of the cover type. Nine sites were selected in each of the predominant cover types on the property: Grassland, Scattered Juniper, Moderate Juniper, and Dense Juniper. Five sites were selected in the Agriculture Cover Type, and one in each of the four Burned cover types. Riparian transect sites were selected from a set of pre-existing riparian photo-monitoring points, and were spread across the length of the creek on the property.

Field Methods:

Field work was conducted between May 21 and May 30, 2001.

Field crews navigated to study sites using handheld Garmin brand GPS units. Transect starting points were marked with rebar, and GPS coordinates were noted on data sheets. Transect azimuths were randomly selected from a random number list. If the selected bearing caused the transect to leave the cover type, a second random bearing was selected. This could occur either before starting, or during, measurement of a transect.

Transect lengths were varied between cover types, and ranged from 200 feet in uniform agricultural fields to 1,000' in juniper. Transects are divided into 100-foot sampling units (n), and transect length is determined based upon variation between sampling units. The sample size is determined through use of the following equation:

$$n = \frac{t^2 s^2}{B^2}$$

where: $t$ = t value at the 95 percent (0.05) confidence interval for the appropriate degrees of freedom (*df*); $s$ = standard deviation; and $B$ = bounds (± 10 percent).

On each transect, data were collected as necessary for the HSI model(s) to be applied in the cover type. Tables 3 and 4 present a summary of the data collection protocols in upland and riparian transects, respectively.

Table 3. Summary of upland transects field data collection protocol. For more information on variables, see HSI models in Appendix A.

| Upland Transects | | | Western Meadowlark | Mule Deer |
|---|---|---|---|---|
| Every 25’ | Read a 0.5 m2 plot frame for: | | | |
| | | % cover herbaceous vegetation | V1 | |
| | | & of herb. veg. composed of grass | V2 | |
| | | Avg. height of herbaceous veg | V3 | |
| | | % cover of palatable herb. veg. | | V5 |
| | Use a laser range finder to measure: | | | |
| | | Feet to nearest perch | V4 | |
| Every 2’ | Record a point-intercept | | | |
| | | Shrub Species | V5 | V1, V2, V4 |
| | | Shrub Height | | V3, V10 |

Table 4. Summary of riparian transects field data collection protocol. For more information on variables, see HSI models in Appendix A.

| Riparian Transects | | | Yellow Warbler | Mink |
|---|---|---|---|---|
| Every 5’ | Record a point-intercept | | | |
| | | Percent deciduous shrub crown cover | V1 | |
| | | Shrub height | V2 | |
| | | Shrub species. (% hydrophytic) | V3 | |
| | | % tree, shrub, or persistent emergent herbaceous veg | | V1 |
| At 100’ & 300’ | 100 m paired side transects, Every 2 m on side transect, record point-intercept | | | |
| | | % tree &/or shrub canopy closure within 100 m of water | | V4 |
| Estimate | Entire Transect | % of year with surface water | | V2 |
| Every 5’ | Record Width of Riparian Habitat | | Calculation of Area | |

Data Analysis:

Field data were entered into spreadsheets and tabulated as necessary to calculate HSI variables.

Additional variable results were calculated from GIS data as needed. For example, the Mule Deer model required calculations for several landscape variables. Each cover type was divided into eight aspect classes using GIS software, and the percent of each was used to calculate V7 according to the model. Presence of winter wheat or alfalfa within 1 mile (V6) was estimated to be true for 10% of the property, this variable was therefore entered as 10% of its maximum value in all calculations. Road density (V8) was similarly averaged across cover types, and received a score of 0.8.

Topographic diversity (V9), was considered to be best described on the property by Category E: Mountainous terrain with slopes greater than 25%, and thus received a score of 0.7.

For each model, the number of acres within each cover type was multiplied by the average HSI within the cover type, yielding the number of H.U.s for the cover type. H.U.s were subsequently summed across cover types to give total H.U.s for each species.

**Results:**

Average HSI for each model in each cover type, along with the number of acres of the cover type and the resulting number of HUs, are summarized in Table 5.

Western Meadowlark habitat on Pine Creek Ranch is generally of high quality according to our field measurements and the HSI model, with average HSI per cover type ranging from a high of 0.87 in agricultural fields, to a low of 0.28 in burned areas of moderate and high density juniper.

Mule Deer habitat generally received lower HSI values, ranging from 0.28 in scattered juniper to 0.11 in agricultural fields. Generally, mule deer habitat quality on the ranch, according to the HSI model, was most limited by the availability of preferred forage shrub species. Palatable herbaceous forage, as well as cover and landscape variables, were generally at least adequate, and often received high scores, while the number of preferred shrub species, and percent cover of preferred shrub species, typically received low scores. These preferred shrub species (such as bitterbrush, Purshia tridentata) are widely distributed on the property, but typically at low density.

Yellow Warbler habitat along Pine Creek received a relatively high HSI score, of 0.63, while Mink habitat received a low average HSI of 0.31.

The total Habitat Units from this baseline HEP on Pine Creek Ranch are 14,057.

Table 5. Baseline Average HSIs and HUs by Species and Cover Type.

| Cover Type | Acres | Western Meadowlark | | Mule Deer | | Yellow Warbler | | Mink | |
|---|---|---|---|---|---|---|---|---|---|
| | | HSI | HUs | HSI | HUs | HSI | HUs | HSI | HUs |
| Grassland | 2,635 | 0.78 | 2,054 | 0.20 | 528 | NA | 0 | NA | 0 |
| Agriculture[1] | 242 | 0.87 | 210 | 0.11 | 27 | NA | 0 | NA | 0 |
| Scattered Juniper | 6,464 | 0.66 | 4,249 | 0.28 | 1,793 | NA | 0 | NA | 0 |
| Moderate Juniper | 7,746 | NA | 0 | 0.23 | 1,785 | NA | 0 | NA | 0 |
| Dense Juniper | 4,968 | NA | 0 | 0.23 | 1,151 | NA | 0 | NA | 0 |
| Burned Grassland[2] | 399 | 0.81 | 322 | 0.20 | 81 | NA | 0 | NA | 0 |
| Burned Scat. Juniper[2] | 1,373 | 0.63 | 868 | 0.24 | 323 | NA | 0 | NA | 0 |
| Burned Mod. Juniper[2] | 1,001 | 0.28 | 283 | 0.22 | 220 | NA | 0 | NA | 0 |
| Burned Dense Juniper[2] | 297 | 0.28 | 84 | 0.20 | 58 | NA | 0 | NA | 0 |
| Riparian | 21 | NA | 0 | NA | 0 | 0.63 | 14 | 0.31 | 7 |
| TOTAL: | 25,146 | | 8,070 | | 5,966 | | 14 | | 7 |

**Discussion:**

Long-term management of Pine Creek Ranch for fish and wildlife habitat is expected to increase the numbers of Habitat Units in future HEP surveys. These changes may take place over the next several decades.

Western Meadowlark habitat should increase through management that favors restoration of native grassland habitats, through fire management and/ or mechanical control of juniper. Encroachment by western juniper and invasion by annual grasses such as cheatgrass (Bromus tectorum) and medusahead (Taeniatherum caput-medusae), are the major obstacles to recovery of native grassland habitats on Pine Creek Ranch. It should be noted that the Western Meadowlark HSI model does not consider differences between native bunchgrass and annual grass habitats, other than by looking at average plant heights and cover estimates. This model may therefore return high habitat values from dense annual grasses, areas generally considered by wildlife biologists to be of low habitat and watershed value. While meadowlarks may use areas dominated by annual grasses, it should not be assumed that these areas have equivalent values for other wildlife species.

Mule deer habitat units are likely to increase through an improvement in habitat quality rather than quantity, since the entire ranch is currently considered mule deer habitat. Recovery of preferred forage shrubs would be the most likely route to improvements in mule deer habitat. These shrubs, which include bitterbrush (Purshia tridentata) and mountain mahogany (Cercocarpus ledifolius), currently may be limited by competition with western juniper. In some stands of medium-sized juniper, decadent bitterbrush is common, with no regeneration occurring.

Yellow warbler and mink habitat is likely to both increase in quantity, and improve in quality, as watershed recovery allows expansion of the riparian area on Pine Creek. The total habitat units for riparian habitat species on the ranch will always remain low compared to those for upland species, however.

**Acknowledgements:**

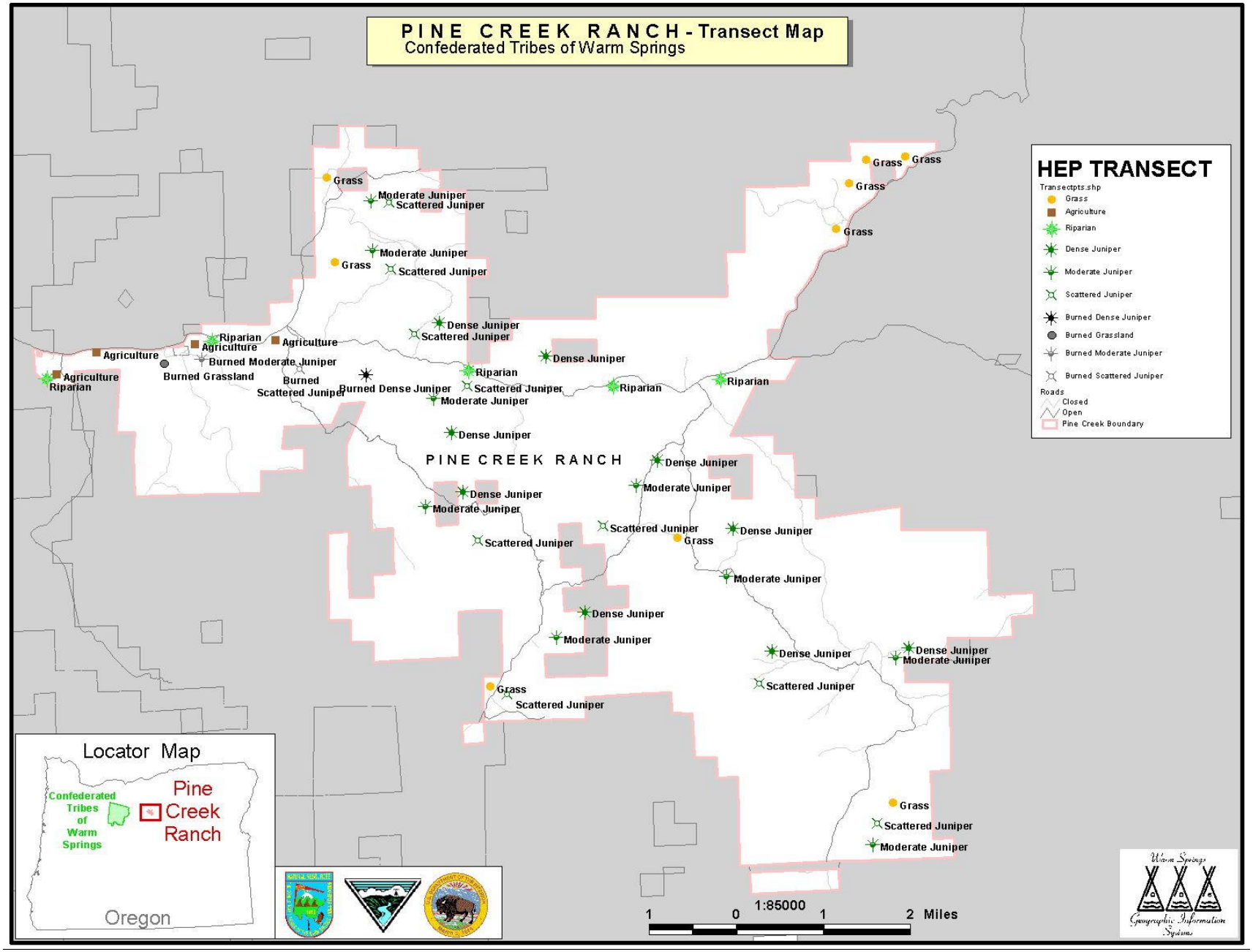
The Confederated Tribes of Warm Springs would like to acknowledge all of the members of the field HEP team for their hard work under hot conditions, and the knowledge and skills they brought to the project. The Tribes would like to extend an additional thanks to Paul Ashley of WDFW and Susan Barnes of ODFW for their assistance in preparing for the field work.

**References:**

Ashley, P. & M. Berger. 1999. Habitat Suitability Model: Mule Deer (Winter). Developed for Bonneville Power Administration, Division of Fish and Wildlife, Portland, OR 97208.

Estimating Wildlife Habitat Variables, FWS/OBS-81/47, U.S. Department of the Interior, Washington, D.C., 1981, 111 pps.

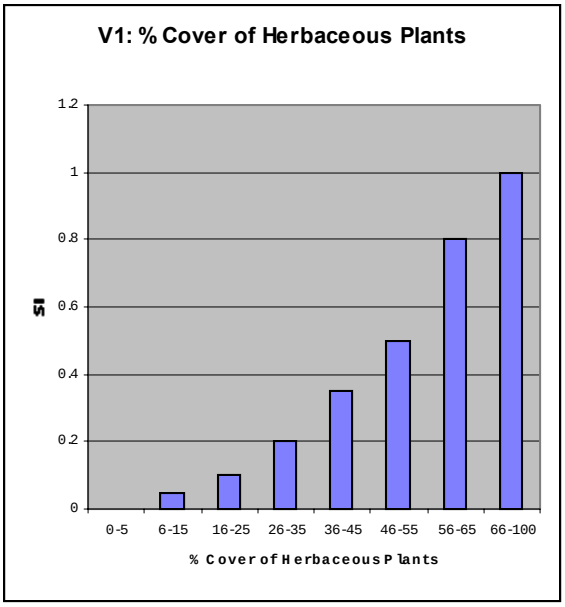
Rasmussen, L. & P. Wright. 1989. Wildlife Impact Assessment: John Day Project, Oregon and Washington. Annual reports 1989: U.S. Dept. of Energy, Bonneville Power Administration, Dept. of Fish & Wildlife, P.O. Box 3621, Portland, OR 97208-3621.

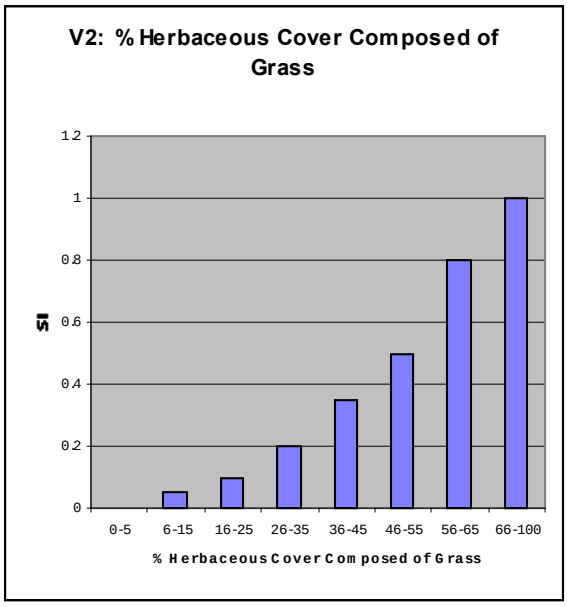

PINE CREEK RANCH - Transect Map
Confederated Tribes of Warm Springs
HEP TRANSECT
Transectpts.shp
Grass
Agriculture
Riparian
Dense Juniper
Moderate Juniper
Scattered Juniper
Burned Dense Juniper
Burned Grassland
Burned Moderate Juniper
Burned Scattered Juniper
Roads
Closed
Open
Pine Creek Boundary
PINE CREEK RANCH
Locator Map
Confederated Tribes of Warm Springs
Pine Creek Ranch
Oregon
1 0 1 2 Miles
1:85000
Warm Springs Geographic Information Systems

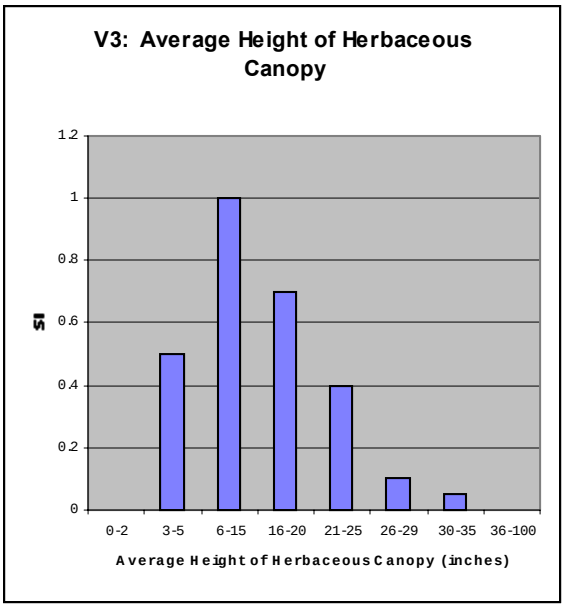
# APPENDIX A. PINE CREEK RANCH HSI MODELS

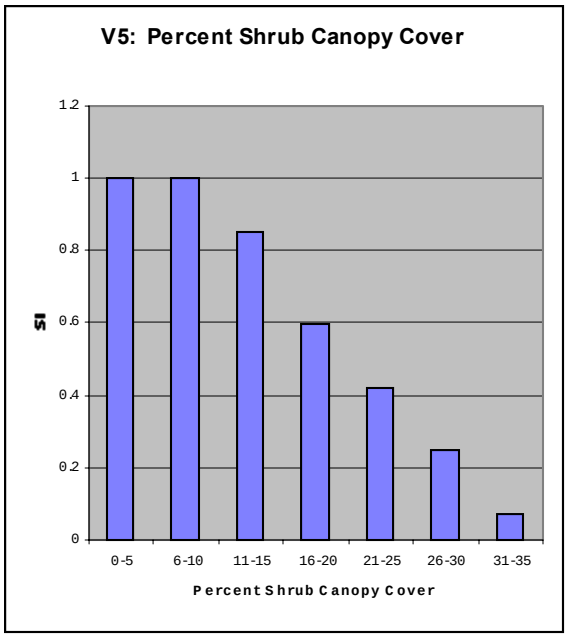
## 1. Western Meadowlark:

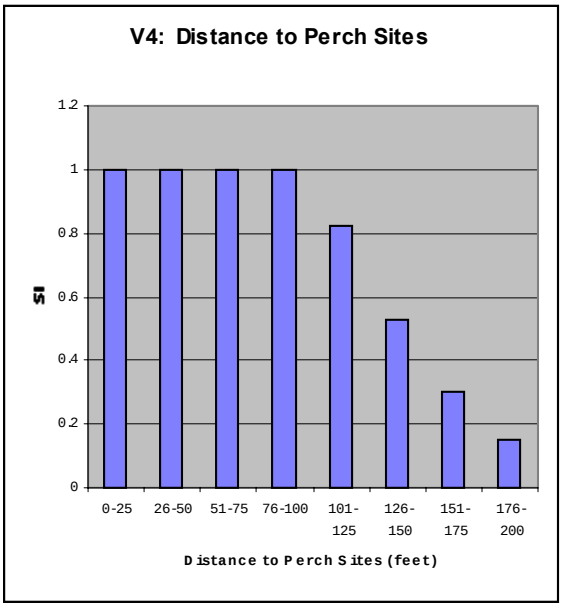
In this model, Western Meadowlark habitat is assumed to be optimal with a high cover of herbaceous plants, composed primarily of grass, of a moderate height (7 to 14"), with perches available within 100', and lacking dense shrub cover. The following histograms were created for this report, based on line graphs in an unpublished HSI model listed as "Modified from Schroeder and Sousa, 1982".





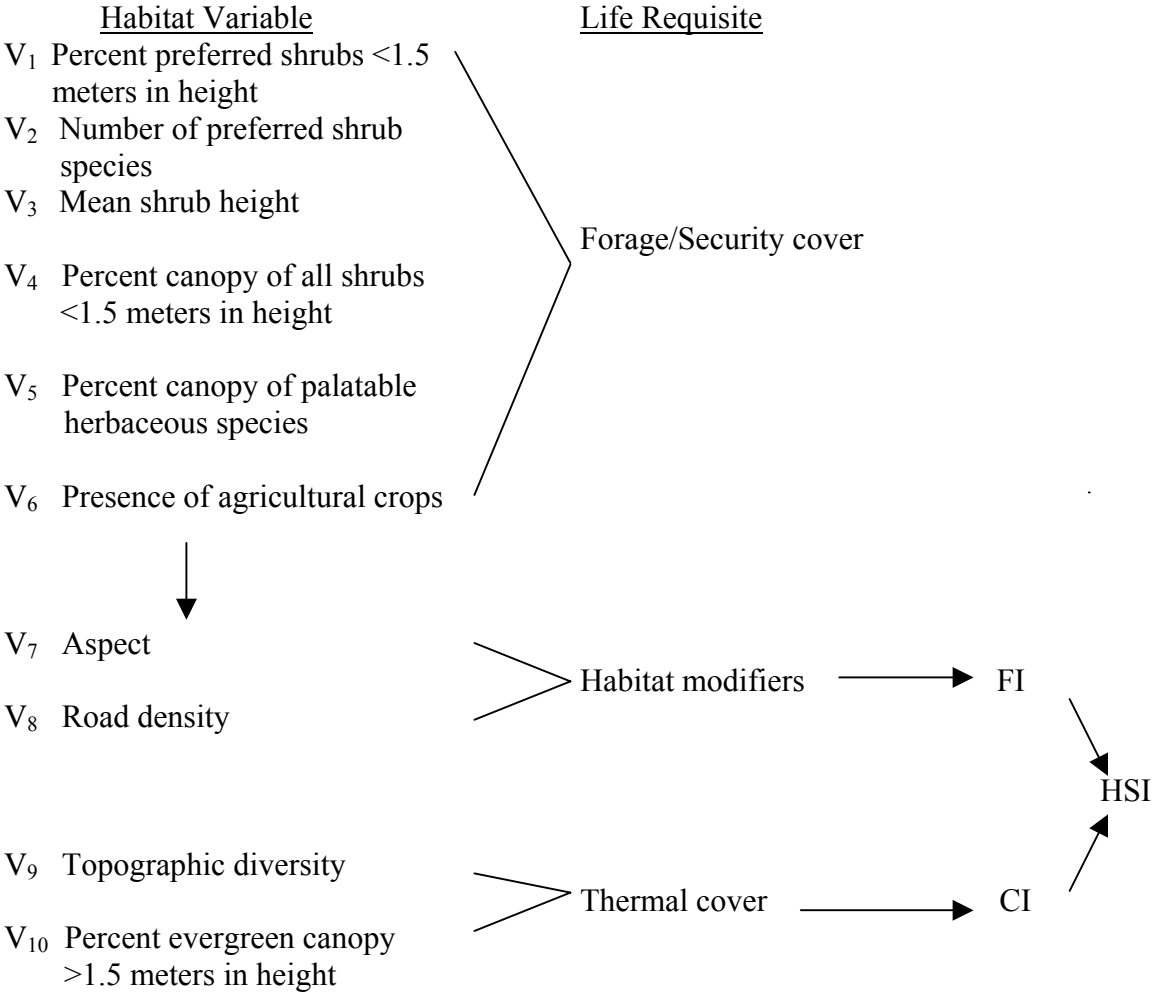



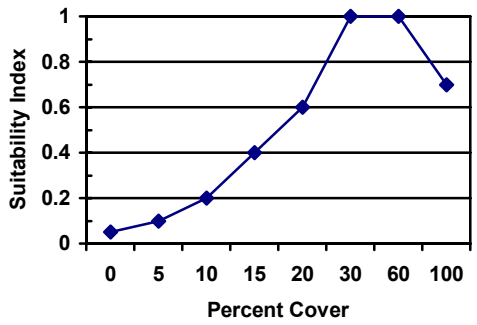

$$HSI = (V1 \times V2 \times V3 \times V4)^{1/2} \times V5$$

**2. Mule Deer:** PINE CREEK MULE DEER HEP MODEL (5 May 01)

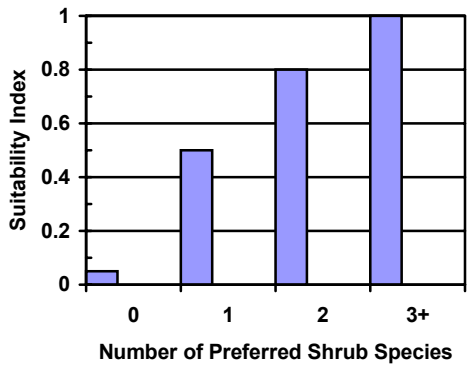
This HEP model was adapted from the Winter Habitat Suitability Model developed by Ashley and Berger (1999). This model was modified by Paul Ashley (WDFW), and reviewed by Terry Luther and Mark Berry (CTWS), to meet habitat conditions found at the Pine Creek mitigation project site. Unlike the original model, this model considers annual forage and cover requirements of mule deer. Minimum suitability indices for food variables are 0.05 because it is assumed that mule deer forage habitat is available within 1.6 km (1 mi) of juniper stands (thermal and hiding cover) for at least a portion of the year. Water is assumed not to be a limiting factor. The relationship between habitat variables, life requisites, and the HSI is illustrated below.



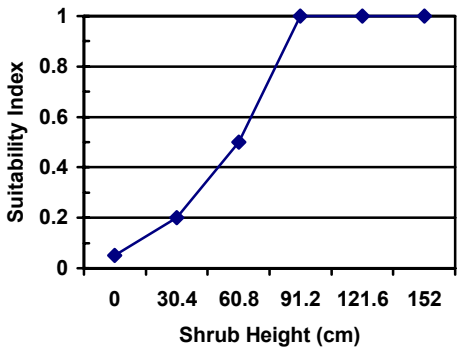
**V1: Percent cover of preferred shrubs < 1.5 m in height (not less than 0.05)**



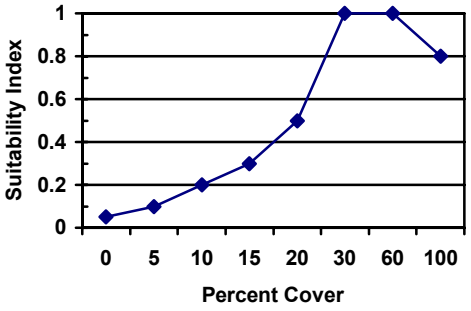

**V2: Number of preferred shrub species (not less than 0.05)**



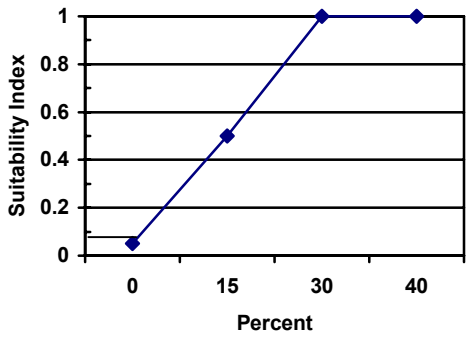

**V3: Mean height all shrubs including juniper**




**V4 Percent cover of all shrubs<1.5 meters in height including juniper (not less than 0.05).**



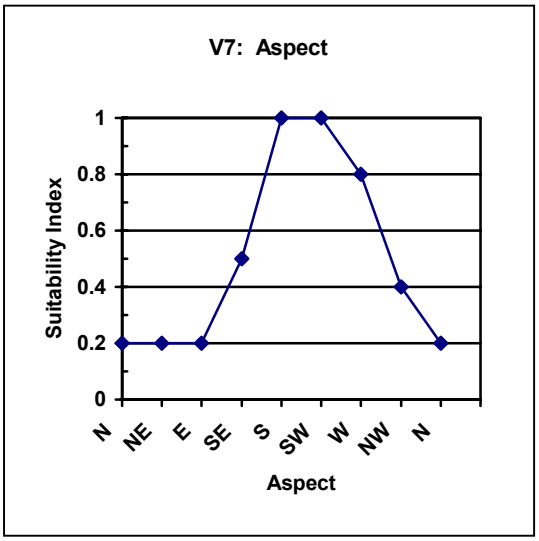

**V5 Percent cover of palatable herbaceous species (not less than 0.05).**

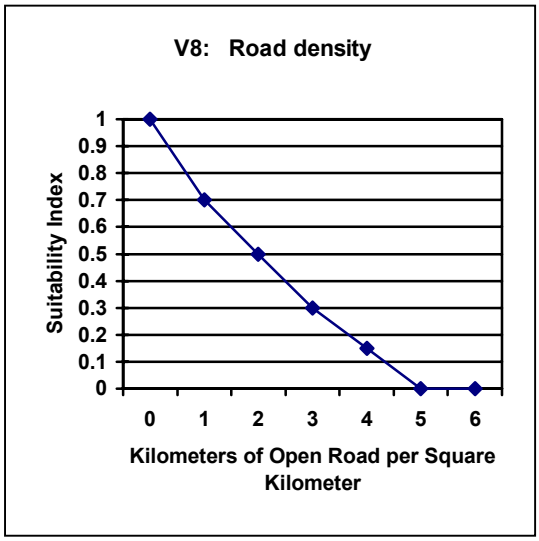



**$V_6$: Presence of suitable agricultural crops within 1.6 kilometers (1 mile) of study area.**

**Yes: 0.1**

**No: 0.0**

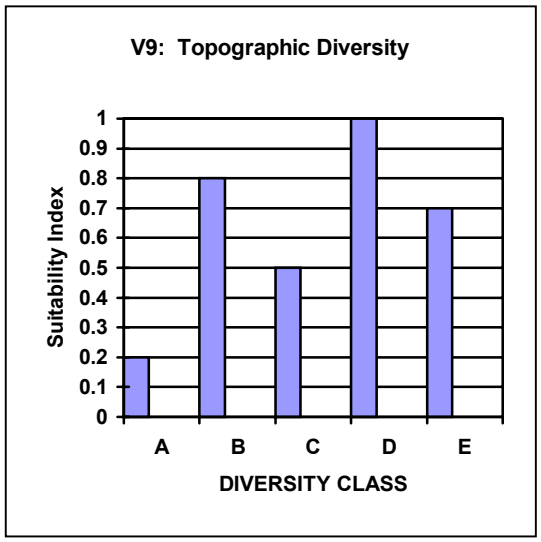


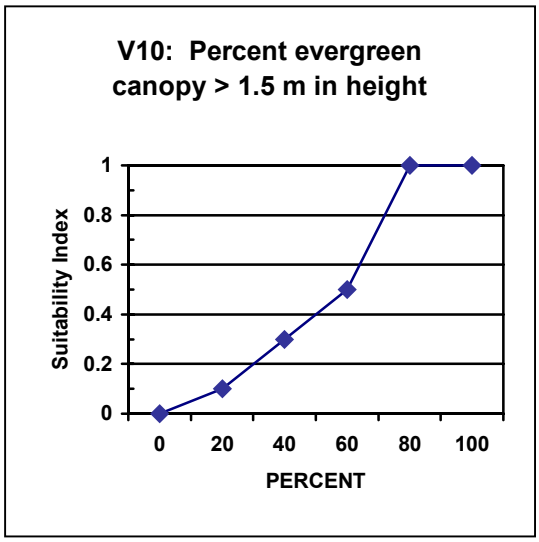




$$\text{Food HSI} = (((V1x\ V2 \times V3 \times V4 \times V5)^{1/5}) + V6) \times V7)^{\wedge .625} \times V8$$

Steps in calculating WFI with a hand calculator:

1. Obtain geometric mean of V1,V2, V3, V4, and V5
2. Add V6
3. Multiply sum obtained in step two by V7
4. Take the 1.66 root (^.6 on your computer)of product from step 3
5. Multiply result from step 4 by V8 to obtain HSI for food




## $V_9$ Topographic diversity.

A: Level terrain less than 5 percent slope.
B: Level terrain broken by drainages.
C: Rolling terrain 5 to 25 percent slope.
D: Rolling terrain with rims, ridges, and/or drainages.
E: Mountainous terrain with slopes greater than 25 percent.

The cover index equation for shrub-steppe habitat emphasizes topographic diversity. The SI for woody evergreen vegetation greater than 1.5 meters (5 feet) in height is additive. The CI for shrub-steppe is described below. If the HSI is greater than 1.0, round down to 1.0.

Cover HSI = ( V9 x .8 ) + V10

HSI determination: The calculation of a Habitat Suitability Index for mule deer considers the life requisite values obtained for food, habitat modifiers, and cover. The HSI is equal to whichever is lower; the food index (FI) or cover index (CI).

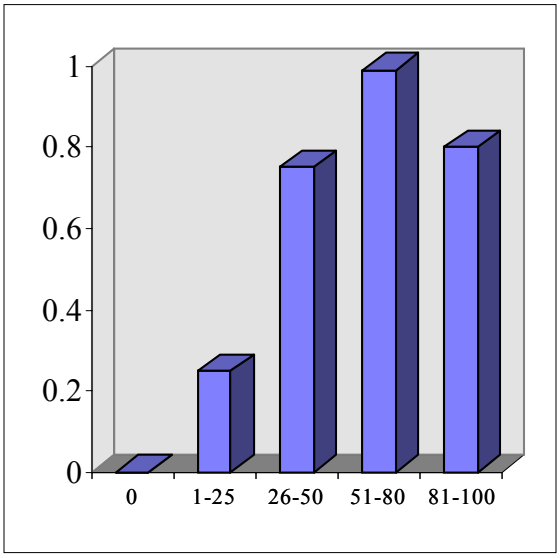
**3. Yellow Warbler:**

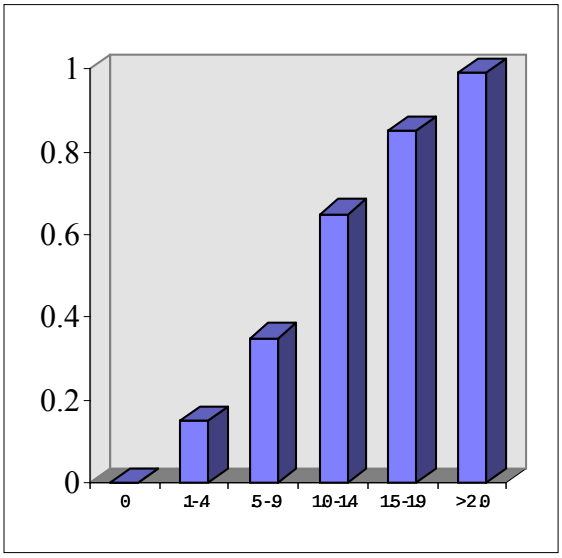
It is assumed that optimal habitats contain 100% hydrophytic deciduous shrubs and that habitats with no hydrophytic shrubs will provide marginal suitability. Shrub densities between 60 and 80% crown cover are assumed to be optimal. As shrub densities approach zero cover suitability also approaches zero. Totally closed shrub canopies are assumed to be of only moderate suitability, due to the probable restrictions on movement of the warbles in those conditions. Shrub heights of 2 m or greater are assumed to be optimal, and suitability will decrease as the heights decrease.

---

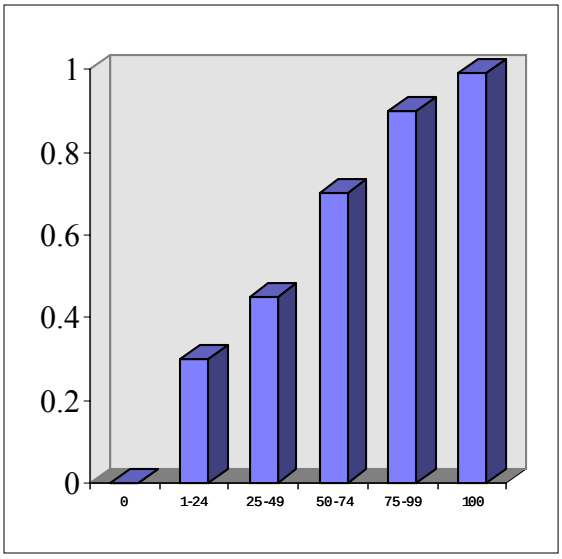
This HSI model was modified into a histogram from the HSI Models: yellow warbler, FWS/OBS-82/10.27 by R.L. Schroeder, 1982. From Baseline HEP Sivert-Duramus, WA, report by Darren Holmes, Kalispel Natural Resources Department, March, 2001.

**Yellow Warbler HSI Model**




**V1** Percent deciduous shrub crown cover **V2** Average height of deciduous shrub canopy




**V3** Percent of deciduous shrub canopy comprised of hydrophytic shrubs

Yellow warbler variable definitions -

V1 - Yellow warbler. Percent deciduous shrub crown is the percent of the ground shaded by a vertical projection of the canopies of woody deciduous vegetation that is less than 5 m in height.

V2 - Yellow warbler. Average height of deciduous shrub canopy is the average height from the ground to the top of those shrubs which comprise the uppermost shrub canopy.

V3 - Yellow warbler. Percent of deciduous shrub canopy comprised of hydrophytic shrubs is the relative percent of the amount of hydrophytic shrubs as compared to all shrubs based on variable 2.

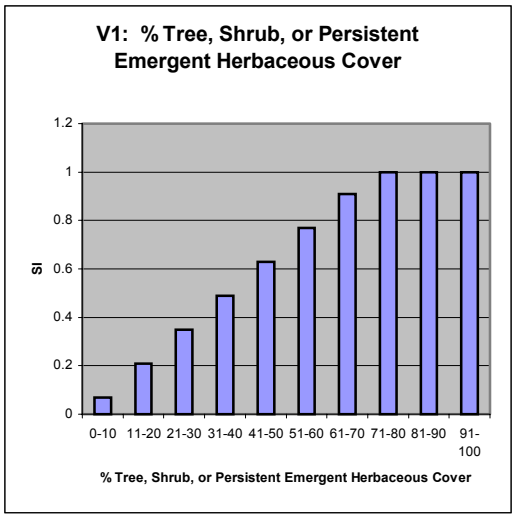
**4. Mink:**

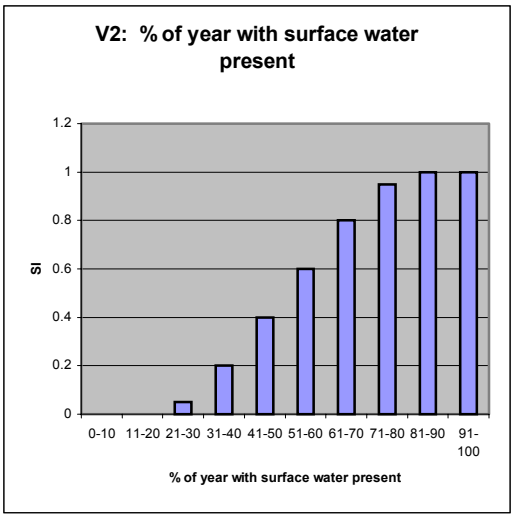
Model Overview, from Allen: FWS/OBS-82/10.61 REVISED, MAY 1984

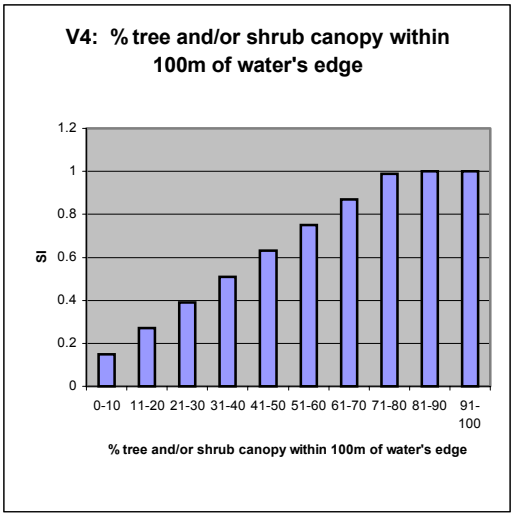
"The year-round habitat requirements of mink can be satisfied within wetland, riverine, or lacustrine cover types if sufficient vegetation or cover is present to support an adequate prey base. Although not totally restricted to wetland or wetland-associated habitats, the mink is dependent on aquatic organisms as a food source for a large portion of the year. Transient use of upland habitats may occur, particularly during the fall and winter months, when terrestrial prey plays an increasingly important role in the mink's diet. The majority of mink activity (foraging., establishment of dens, and litter rearing) occurs in close proximity to open water. This model assumes that sufficient vegetative cover must be interspersed with, or adjacent to, relatively permanent surface water to provide the maximum potential as mink habitat. It is assumed, in this model, that quality food and cover for the mink can be described by the same set of habitat characteristics. The reproductive habitat requirements of the mink are assumed to be identical to its cover habitat requirements."

The model varies depending upon the cover type, on Pine Creek Ranch we used the model for "Deciduous scrub / shrub wetland", < 405 ha.

**HSI = V2 x ((V1 + V4)/2)**



# APPENDIX F. WAGNER RANCH 2003 BASELINE HABITAT EVALUATION PROCEDURE (HEP) REPORT

**Confederated Tribes of the Warm Springs Reservation of Oregon**
Mark Berry
Habitat Manager
Pine Creek Ranch
39067 Highway 218
Fossil, OR 97830

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## Introduction

Habitat Evaluation Procedure (HEP) is used extensively within the Northwest Power Planning Council's (NPPC) Columbia River Basin Fish and Wildlife Program. Wildlife managers use this procedure to determine habitat lost through the construction of the federal hydro-electric projects and gained through NPPC mitigation program.

The wildlife habitat impacts of constructing John Day Dam on the Columbia River were assessed in 1989 using HEP methods (Rasmussen & Wright, 1989). The project directly impacted 27,455 acres of wildlife habitat. Ten evaluation species were selected, and Habitat Suitability Index (HSI) models for each of the target species were used to determine lost habitat quality and quantity for representative habitat cover types (Table 1). A Habitat Unit (H.U.) is an acre of idealized habitat, and HUs are calculated by multiplying HSI values (ranging from 0.0 to 1.0) times the acreage of a given cover type.

**Table 1. HEP indicator species selected in John Day Pool loss assessment, with acreages of cover types and Habitat Units (H.U.s) lost for each indicator species.**

| Species: | Cover Types (acres flooded) | | | Total H.U.s lost |
|---|---|---|---|---|
| Western Meadowlark | Shrub/Steppe/Grass (12,647) | | | 5,059 |
| Yellow Warbler | Riparian Shrub (1,085) | | | 1,085 |
| Mink | Riparian Shrub (1,085) | Emergent (511) | | 1,437 |
| California Quail | Shrub/Steppe/Grass (12,647) | | | 6,324 |
| Great Blue Heron | Sand/Gravel (3,983) | | | 3,186 |
| Mallard | Riparian Herbaceous (1,178) | Island (6,708) | Emergent (511) | 7,399 |
| Spotted Sandpiper | Sand/Gravel (3,983) | | | 3,186 |
| Canada Goose | Riparian Herbaceous (1,178) | Island (6,708) | Agriculture (2,062) | 8,010 |
| Black-capped Chickadee | Riparian Tree (1,086) | | | 869 |
| Lesser Scaup | Open Water | | | Gain 14,398 |

In 2001, a HEP team evaluated the baseline habitat conditions on the 24,304-acre Pine Creek Ranch, which is intended to partially mitigate for habitat losses at John Day

Dam. The baseline Habitat Units (HU) will be provided as credit to the Bonneville Power Administration (BPA) for protection of habitats within the project.

The Wagner Ranch was acquired and added to the Pine Creek Ranch project by the Confederated Tribes of Warm Springs (CTWS) in fall of 2001. The baseline HEP for Wagner Ranch was conducted May 5 and 6, 2003.

The 2003 HEP team consisted of the following members and agencies: Mark Berry, Confederated Tribes of Warm Springs (CTWS); Brian Cochran, CTWS; Paul Ashley, Washington Dept. of Fish and Wildlife (WDFW); and HEP crew Scott Cox, Brandy Ellis, and Mindy Wallace.

**Methods:**

Cover Types:

Wagner Ranch includes habitats similar to those that were inundated by John Day Pool. A large portion of the ranch is upland bunchgrass steppe habitat, which is similar to the Shrub/Steppe/Grass cover type, 12,647 acres of which were lost under John Day Pool. There also are clear differences between the habitat types on Wagner Ranch and those lost under John Day Pool.

The John Day River riparian area on Wagner Ranch has limited acreages of islands, sand/gravel bars, riparian forests, and emergent herbaceous vegetation compared to the Columbia River before inundation by John Day Pool. Wagner Ranch also has large areas of western juniper woodland, which did not occur at John Day Pool. Finally, the Open Water cover type is not included in the Wagner Ranch HEP. The Wagner Ranch acquisition does not include the adjacent open water of the John Day River.

Digital color orthophotography of Wagner Ranch was acquired in June 2002. The Oregon Natural Heritage Information Center established vegetation monitoring transects and produced a vegetation map based on field data and the 2002 imagery. CTWS GIS staff mapped HEP Cover Types by combining vegetation types previously mapped by ONHIC (Table 2). The Sand/Gravel type was manually identified on the imagery, and acreages were estimated. The Riparian Herbaceous cover type acreage used for the Mallard and Canada Goose models was calculated using a buffer width of 200m from the John Day River, limited to floodplain areas within 10 meters of river elevation, and not including the sand/gravel areas. The majority of this acreage is upland vegetation types, but is potentially utilized by Mallard and Canada Goose.

Table 2. Cover Types and HEP Models on Wagner Ranch.

| John Day Pool Cover Types (acres flooded) | John Day Pool HEP Indicator Species: | Wagner Ranch Cover Type Acres | Wagner Ranch HEP Models |
|---|---|---|---|
| **Shrub/Steppe/Grass (12,647)** | **Western Meadowlark, California Quail** | **5,242** | **Western Meadowlark, Mule Deer** |
| Island (6,708) | Canada Goose, Mallard | 0 | NA |
| Agriculture (2,062) | Canada Goose | 0 | NA |
| **Sand/Gravel (3,983)** | **Spotted Sandpiper, Great Blue Heron** | **12** | **Spotted Sandpiper, Great Blue Heron** |
| **Riparian Herbaceous (1,178)** | **Mallard, Canada Goose** | **209** | **Mallard, Canada Goose** |
| Riparian Tree (1,086) | Black-capped Chickadee | 0 | NA |
| Riparian Shrub (1,085) | Mink, Yellow Warbler | 0 | NA |
| Emergent (511) | Canada Goose, Mallard, Mink | 0 | NA |
| Open Water | Lesser Scaup | None | NA |
| **None applicable** | **Juniper** | **3,790** | **Mule Deer** |

Model Selection:

In an ideal application of HEP to wildlife mitigation, the same cover types would exist at the mitigation site that were lost in the original action, and the same HSI models would be applied at each location. When this is not possible, it is standard practice to apply the same number of HSI models in each cover type.

For the Shrub/Steppe/Grass cover type at John Day Pool, the Western Meadowlark and California Quail models were applied. The Western Meadowlark model was applied at Wagner Ranch to all appropriate cover types, but the existing California Quail HSI model was developed for use primarily in an agricultural setting and could not be practicably applied at Wagner Ranch. For this reason, a Mule Deer model originally developed by Paul Ashley and Matthew Berger (1999) was modified for use at Pine Creek and Wagner Ranch.

The Mule Deer model was also applied to Juniper cover types, which were not included in the original loss assessment.

The riparian habitats along the John Day River on Wagner Ranch include negligible acreage of Riparian Shrub and Riparian Tree types, therefore Mink, Yellow Warbler, and Black-capped Chickadee models were not used.

Only the Spotted Sandpiper model was used on the limited acreage of Sand/Gravel habitat on Wagner Ranch. The Great Blue Heron model was not applicable

due to the lack of suitable reproductive habitat for heronries in the vicinity of Wagner Ranch.

Models for Western Meadowlark, Mule Deer, Spotted Sandpiper, Mallard, and Canada Goose are presented in Appendix A.

Site Selection:

Wagner Ranch HEP sites were selected to follow existing monitoring locations on the ranch. Upland sites were selected from vegetation monitoring transect locations established in 2002 by Oregon Natural Heritage Information Center under contract to the Tribes. Riparian sites were selected from cross-section locations established by ODFW as part of the Aquatic Habitat Survey under contract to the Tribes.

Table 3. Locations of Wagner Ranch HEP Transects

| Cover Type | Transect Number | GPS UTM Location |
|---|---|---|
| **Shrub/Steppe/Grass** | UPVG30 | 10 T 710513 4965480 |
| | UPVG33 | 10 T 710473 4962656 |
| | UPVG34 | 10 T 710977 4963316 |
| | UPVG65 | 10 T 706240 4961669 |
| | UPVG66 | 10 T 707159 4961737 |
| | VGP106 | 10 T 708514 4961986 |
| Juniper | UPVG31 | 10 T 711695 4965623 |
| | UPVG32 | 10 T 712672 4963956 |
| | UPVG35 | 10 T 714345 4963997 |
| | UPVG36 | 10 T 716253 4964837 |
| Riparian Herbaceous | AQHB03 | 10 T 705987 4961665 |
| | AQHB04 | 10 T 706140 4962446 |
| | AQHB05 | 10 T 705554 4962932 |
| | AQHB06 | 10 T 706192 4963624 |

Field Methods:

Field work was conducted May 5 and May 6, 2003.

Field crews navigated to study sites using handheld Garmin brand GPS units. Transect starting points were marked with rebar, and GPS coordinates were noted on data sheets. Transect azimuths were randomly selected from a random number list. If the selected bearing caused the transect to leave the cover type, a second random bearing was selected. This could occur either before starting, or during, measurement of a transect.

Transect lengths were varied between cover types, and ranged from 200 feet in uniform agricultural fields to 1,000' in juniper. Transects are divided into 100-foot sampling units (n), and transect length is determined based upon variation between sampling units. The sample size is determined through use of the following equation:

$$n = \frac{t^2 s^2}{B^2}$$

where: $t$ = t value at the 95 percent (0.05) confidence interval for the appropriate degrees of freedom ($df$); $s$ = standard deviation; and $B$ = bounds (± 10 percent).

On each transect, data were collected as necessary for the HSI model(s) to be applied in the cover type. Tables 4 and 5 present a summary of the data collection protocols in upland and riparian transects, respectively.

Table 4. Summary of upland transects field data collection protocol. For more information on variables, see HSI models in Appendix A.

| **Upland Transects** | | | **Western Meadowlark** | **Mule Deer** |
|---|---|---|---|---|
| Every 25’ | Read a 0.5 m2 plot frame for: | | | |
| | | % cover herbaceous vegetation | V1 | |
| | | & of herb. veg. composed of grass | V2 | |
| | | Avg. height of herbaceous veg | V3 | |
| | | % cover of palatable herb. veg. | | V5 |
| | Use a laser range finder to measure: | | | |
| | | Feet to nearest perch | V4 | |
| Every 2’ | Record a point-intercept | | | |
| | | Shrub Species | V5 | V1, V2, V4 |
| | | Shrub Height | | V3, V10 |

Table 5. Summary of riparian herbaceous transects field data collection protocol. For more information on variables, see HSI models in Appendix A.

| **Riparian Herbaceous Transects** | | | **Mallard** | **Canada Goose** |
|---|---|---|---|---|
| At origin and 100 yds downstream | At water’s edge, record: | | | |
| | | Ocular estimate, Ratio % cover emergent veg : % open water | V7 | |
| | | Record type and width of wetland buffer present at edge of river | | V2 |
| | 200 yd transect perpendicular to water’s edge, Every 2 yds, record point-intercept | | | |
| | | % herb. or shrub canopy cover within 100 yds of water | V3 | |
| | | % herb. or shrub canopy cover 100 to 200 yds from water | V4 | |
| | | Height of herbaceous nesting cover (inches) | V5 | |
| Record | Entire Transect | | | |
| | | Disturbance by people and dogs | V6 | |
| | | Presence/absence of carp | V8 | |
| | | Water regime | V9 | |
| | | Presence of foraging areas | | V3 |

Data Analysis:

Field data were entered into spreadsheets and tabulated as necessary to calculate HSI variables.

Additional variable results were calculated from GIS data as needed. For example, the Mule Deer model required calculations for several landscape variables. Each cover type was divided into eight aspect classes using GIS software, and the percent of each was used to calculate V7 according to the model. Presence of winter wheat or alfalfa within 1 mile (V6) was estimated to be true for 10% of the property, this variable was therefore entered as 10% of its maximum value in all calculations. Road density (V8) was similarly averaged across cover types, and received a score of 0.8. Topographic diversity (V9), was considered to be best described on the property by Category E: Mountainous terrain with slopes greater than 25%, and thus received a score of 0.7.

For each model, the number of acres within each cover type was multiplied by the average HSI within the cover type, yielding the number of H.U.s for the cover type. H.U.s were subsequently summed across cover types to give total H.U.s for each species.

**Results:**

Average HSI for each model in each cover type, along with the number of acres of the cover type and the resulting number of HUs, are summarized in Table 6.

Western Meadowlark habitat on Pine Creek Ranch is generally of fairly high quality according to our field measurements and the HSI model, with average HSI in the Shrub/Steppe/Grass cover type of 0.57. Generally, the two variables that reduced the HSI for Western Meadowlark were the height of herbaceous vegetation and percent cover of herbaceous vegetation.

Mule Deer habitat received lower HSI values, of 0.24 in juniper and 0.27 in shrub/steppe/grass. Generally, mule deer habitat quality on the ranch, according to the HSI model, was most limited by the availability of preferred forage shrub species. Palatable herbaceous forage, as well as cover and landscape variables, were generally at least adequate, and often received high scores, while the number of preferred shrub species, and percent cover of preferred shrub species, typically received low scores. These preferred shrub species (such as bitterbrush, Purshia tridentata) are widely distributed on the property, but typically at low density.

Spotted Sandpiper habitat on the ranch was limited to an estimated 12 acres of the Sand/Gravel cover type.

Mallard habitat suitability on the ranch was limited by the brood-rearing habitat suitability index. There is very limited emergent vegetation on the bank of the John Day River within the ranch, which reduced the score for brood-rearing suitability.

Canada Goose habitat suitability was also considered to be low, due to both the lack of a wetland buffer at the water's edge, and the lack of large foraging areas with vegetation less than 4 inches high.

Both Mallards and Canada Geese breed on the John Day River, but in relatively low numbers compared to areas with emergent wetlands.

The total Habitat Units from this baseline HEP on Wagner Ranch are 5,553.

Table 6. Baseline Average HSIs and HUs by Species and Cover Type.

| Cover Type | Western Meadowlark | | Mule Deer | | Spotted Sandpiper | | Mallard | | Canada Goose | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | HSI | HUs | HSI | HUs | HSI | HUs | HSI | HUs | HSI | HUs |
| Shrub/Steppe/Grass 5,463 acres | 0.57 | 3,114 | 0.27 | 1,475 | NA | 0 | NA | 0 | NA | 0 |
| Sand/Gravel 12 acres | NA | 0 | NA | 0 | 1 | 12 | NA | 0 | NA | 0 |
| Riparian Herb. 209 acres | NA | 0 | NA | 0 | NA | 0 | 0.1 | 21 | 0.1 | 21 |
| Juniper 3,790 acres | NA | 0 | 0.24 | 910 | NA | 0 | NA | 0 | NA | 0 |
| TOTAL HUs: | | 3,114 | | 2,385 | | 12 | | 21 | | 21 |

**Discussion:**

Long-term management of Pine Creek Ranch for fish and wildlife habitat is expected to increase the numbers of Habitat Units in future HEP surveys. These changes may take place over the next several decades.

Western Meadowlark habitat should increase through management that favors restoration of native grassland habitats, through fire management and/ or mechanical control of juniper. Encroachment by western juniper and invasion by annual grasses such as cheatgrass (Bromus tectorum) and medusahead (Taeniatherum caput-medusae), are the major obstacles to recovery of native grassland habitats on Pine Creek Ranch. It should be noted that the Western Meadowlark HSI model does not consider differences between native bunchgrass and annual grass habitats, other than by looking at average plant heights and cover estimates. This model may therefore return high habitat values from dense annual grasses, areas generally considered by wildlife biologists to be of low habitat and watershed value. While meadowlarks may use areas dominated by annual grasses, it should not be assumed that these areas have equivalent values for other wildlife species.

Mule deer habitat units are likely to increase through an improvement in habitat quality rather than quantity, since the entire ranch is currently considered mule deer habitat. Recovery of preferred forage shrubs would be the most likely route to improvements in mule deer habitat. These shrubs, which include bitterbrush (Purshia tridentata) and mountain mahogany (Cercocarpus ledifolius), currently may be limited by competition with western juniper. In some stands of medium-sized juniper, decadent bitterbrush is common, with no regeneration occurring.

If riparian recovery on the John Day River leads to development of riparian shrub and riparian tree habitat types, this will result in suitable habitat for yellow warbler, mink, and black-capped chickadee, and may result in suitable habitat for great blue heron nesting. No major increases in mallard or Canada goose habitat are expected.

**Acknowledgements:**

The Confederated Tribes of Warm Springs would like to acknowledge all of the members of the field HEP team for their work, and the knowledge and skills they brought to the project. The Tribes would like to extend an additional thanks to Paul Ashley of WDFW for his assistance in preparing for the field work.

**References:**

Ashley, P. & M. Berger. 1999. Habitat Suitability Model: Mule Deer (Winter). Developed for Bonneville Power Administration, Division of Fish and Wildlife, Portland, OR 97208.

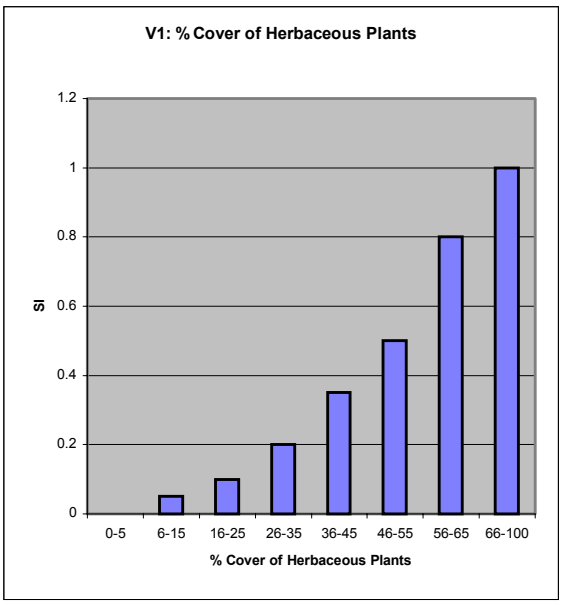
Estimating Wildlife Habitat Variables, FWS/OBS-81/47, U.S. Department of the Interior, Washington, D.C., 1981, 111 pps.

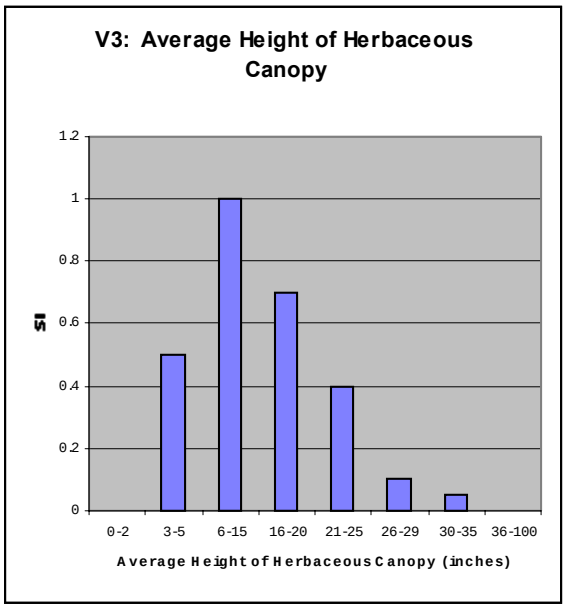
Rasmussen, L. & P. Wright. 1989. Wildlife Impact Assessment: John Day Project, Oregon and Washington. Annual reports 1989: U.S. Dept. of Energy, Bonneville Power Administration, Dept. of Fish & Wildlife, P.O. Box 3621, Portland, OR 97208-3621.

# APPENDIX A. WAGNER RANCH HSI MODELS

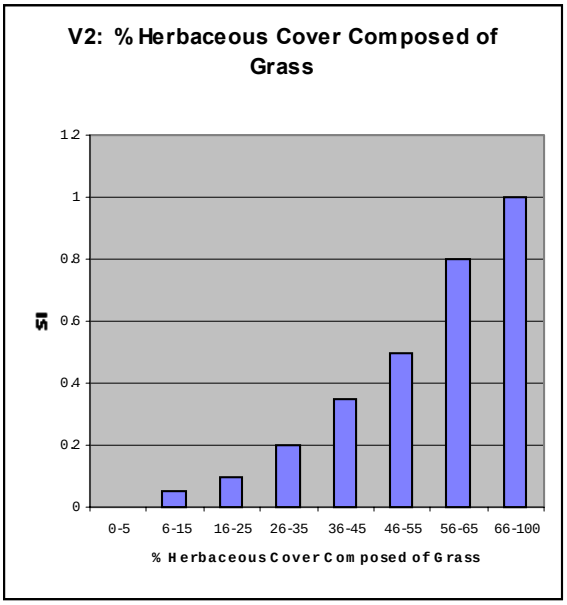
## 1. Western Meadowlark:

In this model, Western Meadowlark habitat is assumed to be optimal with a high cover of herbaceous plants, composed primarily of grass, of a moderate height (7 to 14"), with perches available within 100', and lacking dense shrub cover. The following histograms were created for this report, based on line graphs in an unpublished HSI model listed as "Modified from Schroeder and Sousa, 1982".



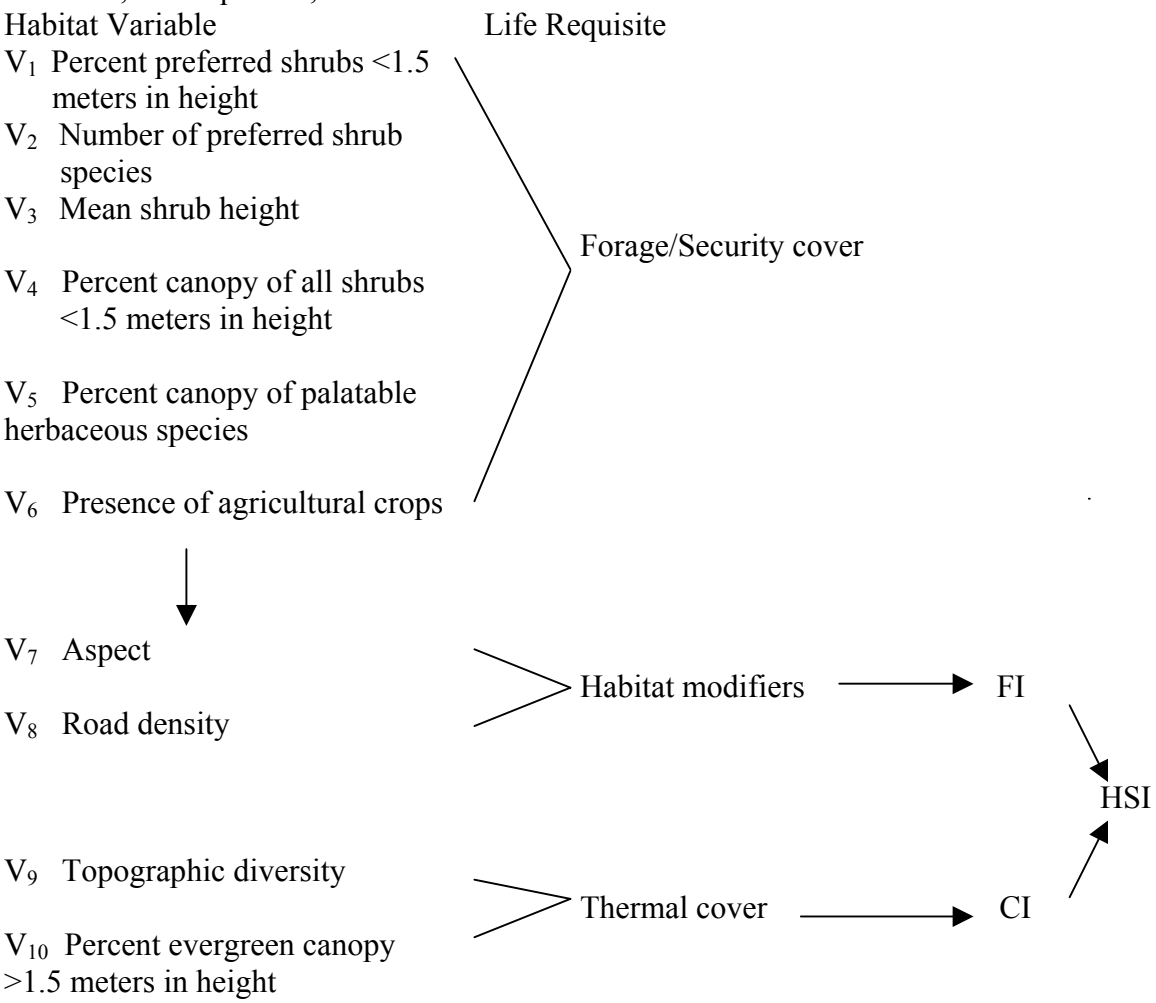




**HSI = (V1 x V2 x V3 x V4) $^{½}$ x V5**

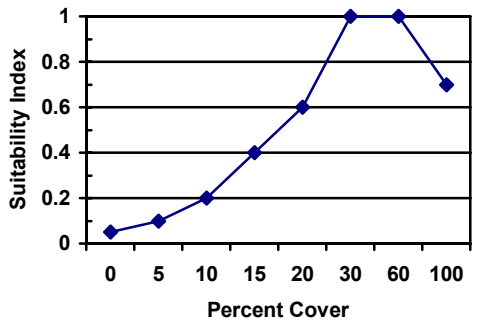


## **2. Mule Deer:** PINE CREEK MULE DEER HEP MODEL (5 May 01)

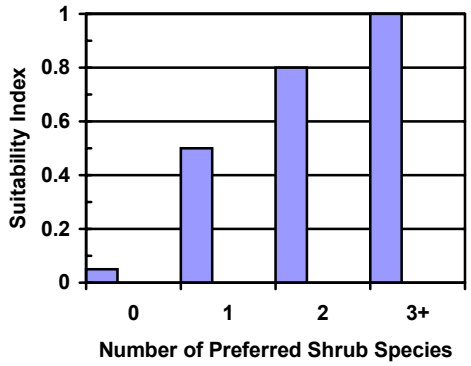
This HEP model was adapted from the Winter Habitat Suitability Model developed by Ashley and Berger (1999). This model was modified by Paul Ashley (WDFW), and reviewed by Terry Luther and Mark Berry (CTWS), to meet habitat conditions found at the Pine Creek mitigation project site. Unlike the original model, this model considers annual forage and cover requirements of mule deer. Minimum suitability indices for food variables are 0.05 because it is assumed that mule deer forage habitat is available within 1.6 km (1 mi) of juniper stands (thermal and hiding cover) for at least a portion of the year. Water is assumed not to be a limiting factor. The relationship between habitat variables, life requisites, and the HSI is illustrated below.



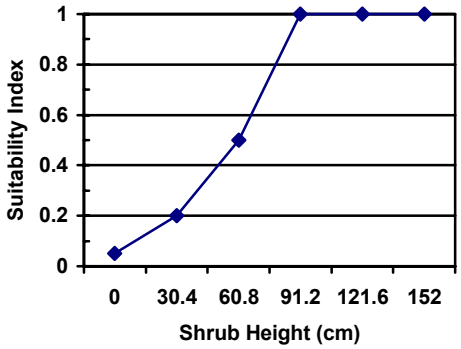
**V1: Percent cover of preferred shrubs < 1.5 m in height (not less than 0.05)**



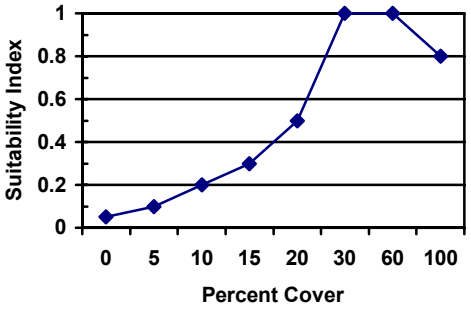

**V2: Number of preferred shrub species (not less than 0.05)**



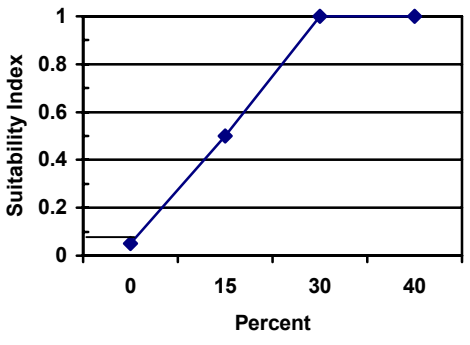

**V3: Mean height all shrubs including juniper**




**V4 Percent cover of all shrubs<1.5 meters in height including juniper (not less than 0.05).**



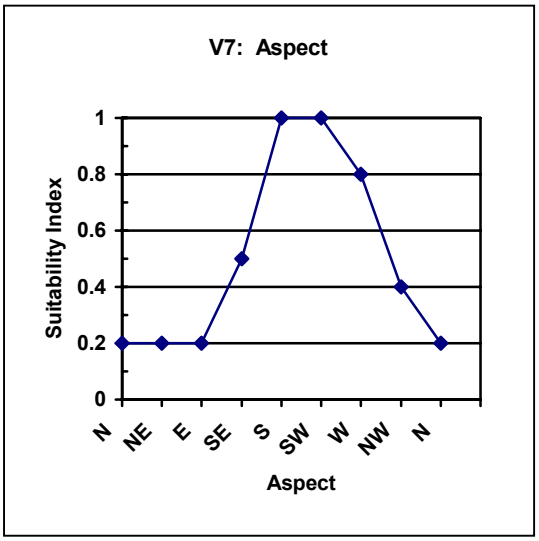

**V5 Percent cover of palatable herbaceous species (not less than 0.05).**

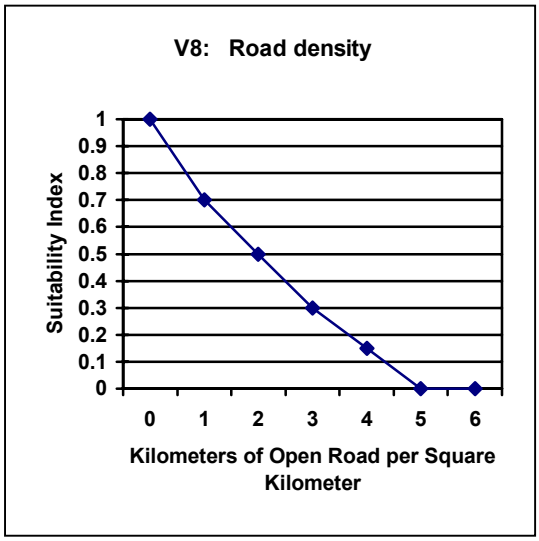



**$V_6$: Presence of suitable agricultural crops within 1.6 kilometers (1 mile) of study area.**

**Yes: 0.1**

**No: 0.0**

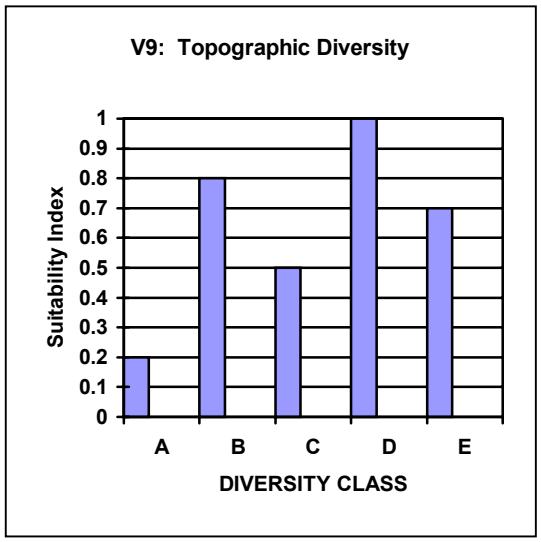


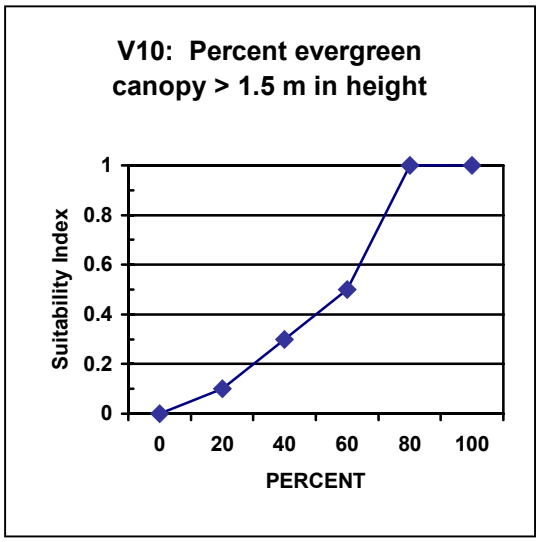




$$\text{Food HSI} = (((V1x\ V2 \times V3 \times V4 \times V5)^{1/5}) + V6) \times V7)^{\wedge .625} \times V8$$

Steps in calculating WFI with a hand calculator:

6. Obtain geometric mean of V1,V2, V3, V4, and V5
7. Add V6
8. Multiply sum obtained in step two by V7
9. Take the 1.66 root (^.6 on your computer)of product from step 3
10. Multiply result from step 4 by V8 to obtain HSI for food




## $V_9$ Topographic diversity.

A: Level terrain less than 5 percent slope.
B: Level terrain broken by drainages.
C: Rolling terrain 5 to 25 percent slope.
D: Rolling terrain with rims, ridges, and/or drainages.
E: Mountainous terrain with slopes greater than 25 percent.

The cover index equation for shrub-steppe habitat emphasizes topographic diversity. The SI for woody evergreen vegetation greater than 1.5 meters (5 feet) in height is additive. The CI for shrub-steppe is described below. If the HSI is greater than 1.0, round down to 1.0.

Cover HSI = ( V9 x .8 ) + V10

HSI determination: The calculation of a Habitat Suitability Index for mule deer considers the life requisite values obtained for food, habitat modifiers, and cover. The HSI is equal to whichever is lower; the food index (FI) or cover index (CI).

**3. Spotted Sandpiper:**

Spotted Sandpiper HSI Model authored by Geoffrey L. Dorsey (date unknown), summarized below.

V1 = Nesting Cover

"A mosaic of herbaceous ground cover with an overall density of less than 50% and less than 2' high (an overstory of deciduous tress may be present if the ground cover requirements are met). Flooding probably not a significant problem as the sandpiper is quite capable of renesting if necessary.

[150 ft. transect, 25 ft. intervals. Begin transect where V3 crosses daily high water mark and continue inland 150 ft.]"

V2 = Nesting Distance from Water

"Optimum nesting habitat is within 75 feet of water.

[measure minimum distance between nesting habitat and water]"

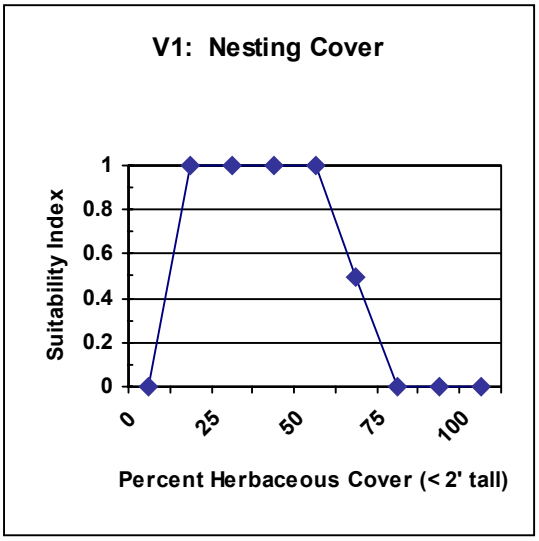
V3 = Foraging habitat

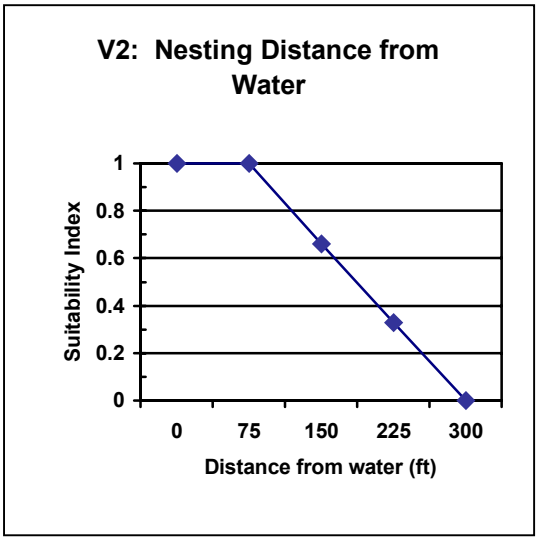
"Open or sparsely vegetated shorelines (gravel, riprap, or sandy substrates) within 150 feet (45 m) of water (normal pool) which may contain some organic debris or drift.

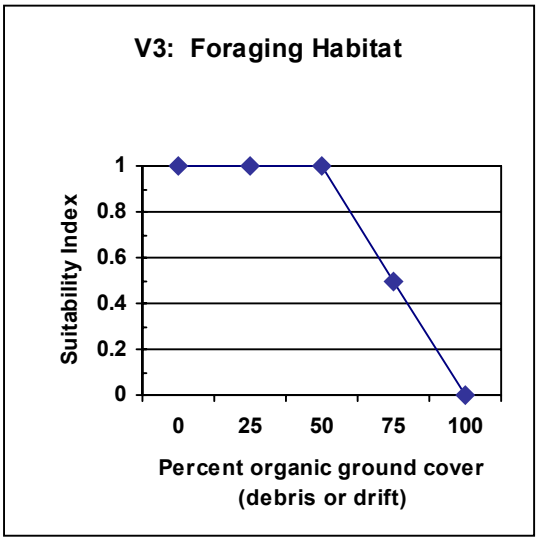
[Begin transect at EOW and go inland 150 ft. with measurements every 25 ft.]"

Model Equation:

HSI = (V1 + V2 + V3) / 3


V1: Nesting Cover
Suitability Index
1
0.8
0.6
0.4
0.2
0
0
25
50
75
100
Percent Herbaceous Cover (< 2' tall)


V2: Nesting Distance from Water
Suitability Index
1
0.8
0.6
0.4
0.2
0
0
75
150
225
300
Distance from water (ft)


V3: Foraging Habitat
Suitability Index
1
0.8
0.6
0.4
0.2
0
0
25
50
75
100
Percent organic ground cover
(debris or drift)

**4. Mallard:**

Excerpted from: Columbia Basin Wildlife Area Mallard HEP Model. Developed for the The Dalles, John Day, and McNary wildlife loss assessment by HEP team members according to information provided by the local, state, federal, and tribal biologists.

Nesting Habitat:
Nesting commonly occurs in riparian herb and upland cover types, located in the vicinity of emergent wetlands. Herbaceous vegetation between 15 and 24 inches tall with at least 75 percent canopy cover is preferred. Mallard nests are found in greater numbers and have a higher success rate if they are within ¼ mile of water with emergent vegetation. The emergent vegetation provides cover and rearing area for the juvenile birds. Emergent wetlands with 40 to 60 percent vegetative cover (relative to open water) are preferred. The success of an otherwise optimum nesting area can be significantly reduced by disturbance from people and dogs.

**Nesting Cover**
Cover Types: Riparian herb, grassland, Shrubgrass, Shrubland, and Shrub-steppe

V3 = Percent canopy cover of vegetation within 100 yards of water with emergent vegetation. Most waterfowl nesting studies indicate that the majority of nests are located within 100 yds of water. As a result, percent canopy cover of nesting vegetation within 100 yds of water is weighted twice as valuable as cover beyond 100 yds from the wetland's edge.

V4 = Percent canopy cover of vegetation from 100 to 200 yards of water with emergent vegetation.

V5 = Height of herbaceous nesting cover (inches)

V6 = Disturbance by people and dogs (public use).

Nesting Cover SI = $(((2(V3) + V4)/3) \times V5)^{1/2} \times V6$

**Brood Rearing**
Cover Types: Emergent wetland, Lacustrine, Palustrine

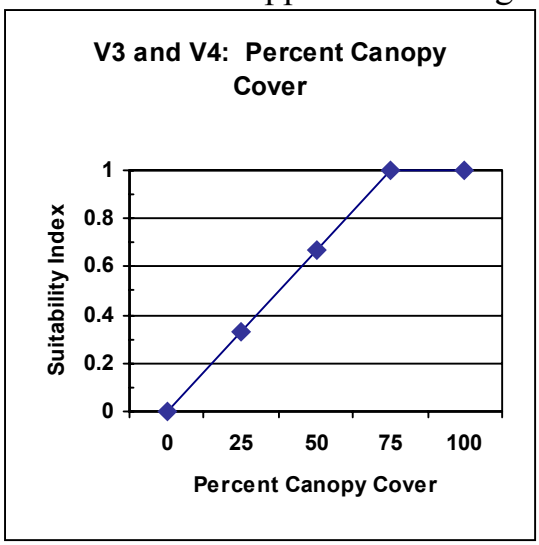
V7 = Percent emergent cover to percent open water ratio

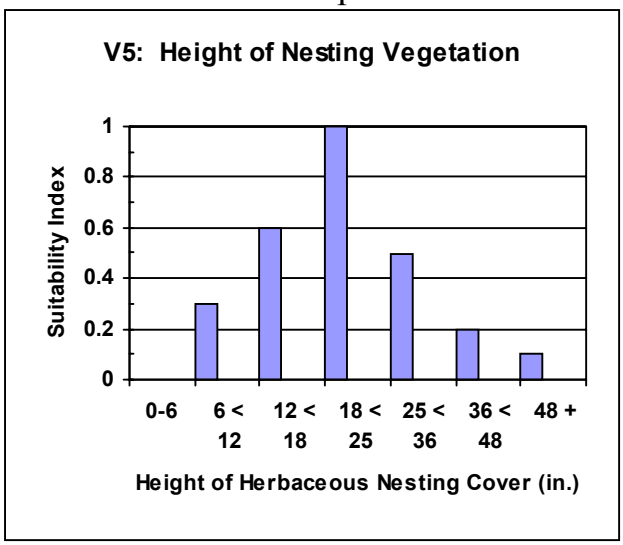
V8 = Presence/absence of carp

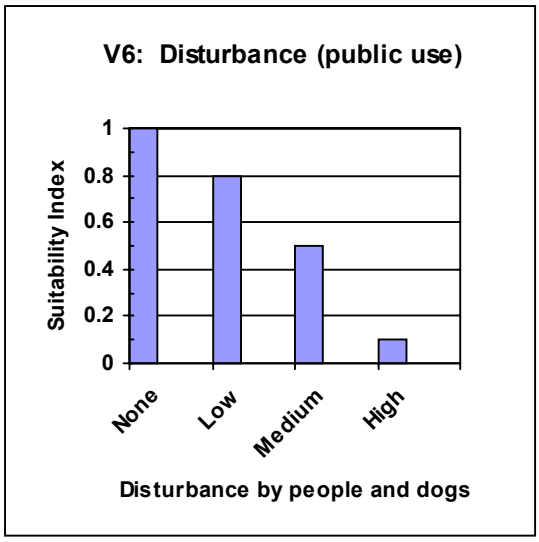
V9 = Water Regime

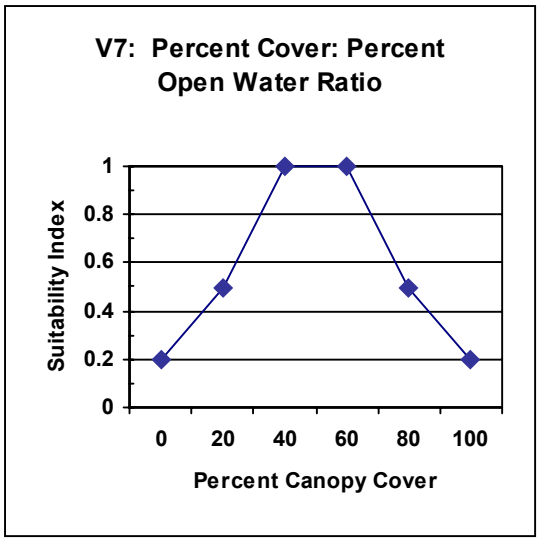
Brood Rearing SI = V7 x V8 x V9

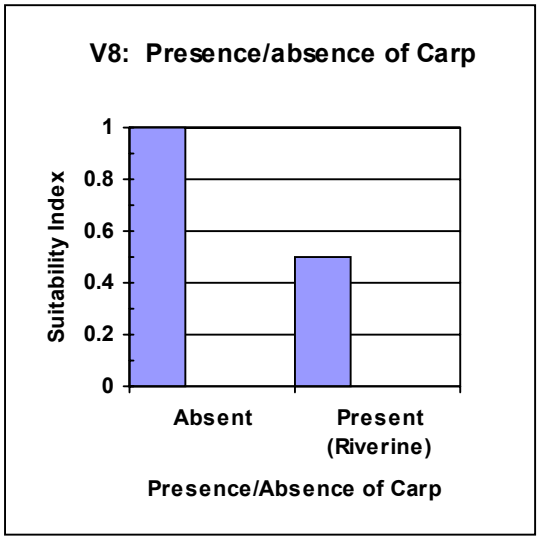
HSI = Lower value of Nesting Cover SI and Brood-rearing SI.

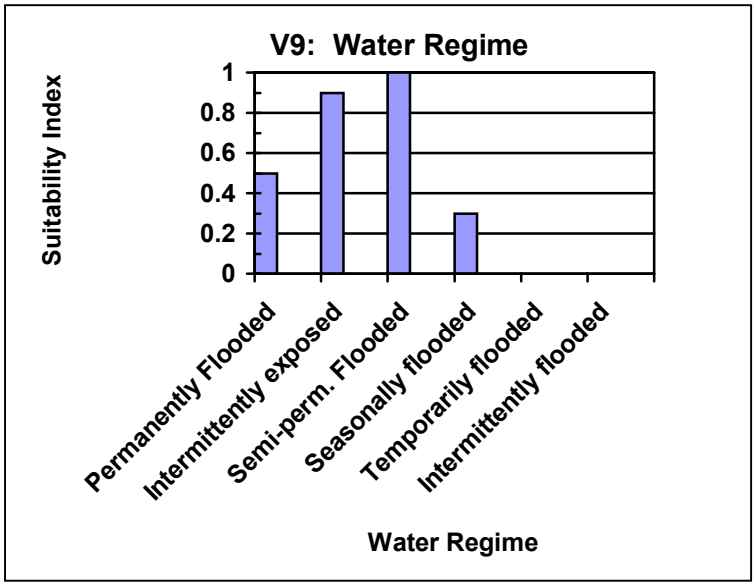

V3 and V4: Percent Canopy Cover
Suitability Index
1
0.8
0.6
0.4
0.2
0
0
25
50
75
100
Percent Canopy Cover


V5: Height of Nesting Vegetation
Suitability Index
1
0.8
0.6
0.4
0.2
0
0-6
6 < 12
12 < 18
18 < 25
25 < 36
36 < 48
48 +
Height of Herbaceous Nesting Cover (in.)


V6: Disturbance (public use)
Suitability Index
1
0.8
0.6
0.4
0.2
0
None
Low
Medium
High
Disturbance by people and dogs


V7: Percent Cover: Percent Open Water Ratio
Suitability Index
1
0.8
0.6
0.4
0.2
0
0
20
40
60
80
100
Percent Canopy Cover


V8: Presence/absence of Carp
Suitability Index
1
0.8
0.6
0.4
0.2
0
Absent
Present (Riverine)
Presence/Absence of Carp


V9: Water Regime
Suitability Index
1
0.8
0.6
0.4
0.2
0
Permanently Flooded
Intermittently exposed
Semi-perm. Flooded
Seasonally flooded
Temporarily flooded
Intermittently flooded
Water Regime

**5. Canada Goose:**

Model used for brooding and rearing habitat in the vicinity of Bonneville Reservoir on the lower Columbia River, developed by Patrick Wright, Larry Rasmussen, and Jim Bottorff of the Portland Field Office, USFWS. Modified from the model developed for the Palisades Reservoir on the Snake River by Dave Lockman et al.

Islands portion of Model not included here.

**Nesting Habitat**
V2 = Shorelines

| | SI Value |
|---|---|
| Portions of cover within 10 m of water; ground cover 4-8", wetland buffer within 50 m of shoreline, may include sloughs or open water. | 0.5 |
| Portions of shoreline cover within 10 meters of water; ground cover <4" or >8"; adjacent wetlands within 50 m of shoreline (does not include open water, rather forested or emergent wetlands). | 0.3-0.4 |
| No shoreline cover, or shoreline cover taller than 10" and/or very dense; buffer >50 m from shoreline to absent. | 0.1-0.2 |

**Brood Rearing Habitat**
V3 = Foraging Area

| | |
|---|---|
| Distance from nesting areas to foraging zones <1/2 mile (preferably within sight of the nesting area); forage <4" tall and > 1 acre in size; foraging zones total > 20 acres per mile of river; edge of foraging zone within 25 m of open water (escape cover). | 0.7 – 1.0 |
| Distance from nesting areas to foraging zones >1/2 mile and < 1 mile; forage <4" tall and > 1 acre in size; foraging zones total 10 to 20 acres per mile of river; edge of foraging zone > 25 m and < 50 m from open water (escape cover). | 0.4 – 0.6 |
| As above except foraging zone > 1 mile from nesting areas and > 50 m from open water (escape cover). | 0.0 – 0.3 |

HSI = (V2 + V3)/2

## APPENDIX G. FY 2004 SCOPE OF WORK FOR PINE CREEK CONSERVATION AREA

**Project:** Pine Creek/Wagner Ranch **BPA Project Number:** 199802200

**Agency:** Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO)

**Contract Amount:** $ 127,500 **Contract Number:** 00015005

**Dates of Contract:** ~~March~~ October 1, 2003 to September 30, 2004

**Contact Information:**

| | |
|---|---|
| **Name** | Mark Berry |
| **Title** | Manager, Pine Creek Conservation Area |
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| **Phone** | 541-489-3477 |
| **Fax** | 541-489-3477 (call ahead) |
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| | |
|---|---|
| **Name** | Terry A. Luther |
| **Title** | Fish, Wildlife, & Parks Manager |
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**Fiscal Officer:**

| | |
|---|---|
| **Name** | Bonnie Langeliers |
| **Mailing address** | Finance Department, P.O. Box C |
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| **Phone** | 541-553-3219 |
| **Email** | blangeliers@wstribes.org |

# FY 2004 SCOPE OF WORK FOR PINE CREEK CONSERVATION AREA

OBJECTIVE 1. Continue to monitor physical and biological conditions of watersheds, habitats, and populations on the Conservation Area.

Task 1.1 Monitor Pine Creek flow and gather meteorological data with USGS.

Task 1.2 Take monitoring photos at riparian monitoring points.

Task 1.3 Count summer steelhead redds with ODFW.

Task 1.4 Conduct big game inventory to calculate age and sex ratios.

Task 1.5 Conduct breeding bird point counts and record bird species observed weekly.

Task 1.6 Work cooperatively with NPS terrestrial vertebrate inventory.

OBJECTIVE 2. Complete and implement management plans.

Task 2.1 Revise draft Wildlife Habitat and Watershed Management Plan, as needed with comments previously received from BPA, and adopt plan.

Task 2.2 Continue to implement the Wildlife Habitat Conservation and Management Plan completed with the cooperation of Oregon Dept. of Fish and Wildlife.

Task 2.3 Revise draft Weed Management Plan based on new information and accomplishments in 2003, in cooperation with Wheeler County Weed Board.

Task 2.4 Update the Wildfire Response Plan for 2004. Work cooperatively with Prineville BLM on planning prescribed fire projects on adjoining BLM & Pine Creek Conservation Area lands. Submit documentation to BPA for NEPA compliance.

Task 2.5 Revise access regulations as needed with the Access Advisory Committee composed of tribal, federal, state, and local representatives.

OBJECTIVE 3. Protect, manage and enhance the assets and resources of Pine Creek Conservation Area.

Task 3.1 Conduct monitoring and treatment of noxious weeds using mechanical, chemical, and biological control as appropriate and in accord with the draft Weed Management Plan. Subcontract with County Weed Officers for herbicide treatments. Habitat Manager to conduct mechanical control with work crews as available.

Task 3.2 Continue plant community restoration work. Continue with third year of contract with L&H seed for propagation of basin wildrye. Continue CREP riparian buffer project on lower 5.4 miles of Pine Creek; including propagation and planting of native grasses, trees, and shrubs.

Task 3.3 Continue juniper control projects targeted at improving watershed condition and wildlife habitats. Juniper will be controlled along Pine Creek tributary streams, as staff and volunteer time permits. Junipers will be felled to allow recovery of riparian vegetation including deciduous shrubs and trees.

Task 3.4 Monitor for trespass cattle, and work with neighboring landowners to reduce trespass problems.

Task 3.5 Continue implementation of regulated public and tribal access program. Maintain posted property boundaries and informational signs. Provide informational brochures, maps, and regulations. Patrol Conservation Area property periodically. Work cooperatively with Oregon State Police to reduce poaching and trespass incidents.

Task 3.6 Work with Prineville BLM and adjoining landowners toward completing a land exchange to consolidate property and facilitate management. Obtain concurrence from BPA Fish and Wildlife Division Director before completing exchange.

Task 3.7 If adequate funding becomes available in a timely manner: Continue project with Wheeler SWCD and USFWS to replace fish-passage barrier culverts with appropriate structures. In 2004, work toward replacing the Pine Creek culvert at Robinson Canyon.

OBJECTIVE 4. Represent the Confederated Tribes of Warm Springs Natural Resources Department in the local community.

Task 4.1 Work cooperatively on watershed and wildlife habitat projects in the Pine Creek and John Day River basins.

OBJECTIVE 5. Deliverables

Task 5.1 Submit Quarterly Reports by days of Jan. 8, Apr. 8, Jul. 8, & Oct. 8, 2004.

Task 5.2 Submit Annual Report for FY2004 by November 29, 2004.

Task 5.3 Submit Final Management Plan to BPA by October 31, 2004.

**ESTIMATED ANNUAL BUDGET (Rounded to Nearest Dollar)**

**CONTRACTOR** Confederated Tribes of Warm Springs
**PROJECT:** Pine Creek Conservation Area
**BPA Project Number:** 1998-022-00
**Contract Dates:** Oct 1 2003 - Sep 30, 2004

**1. Personnel:**

| Title: | months | Monthly | Subtotal | Fringe (23%) | Total | |
|---|---|---|---|---|---|---|
| Habitat Manager | 12 | $2,661 | $31,930 | $7,344 | $39,274 | |
| GIS Specialist | 0.5 | $3,597 | $1,799 | $414 | $2,212 | |
| Fish & Wildlife Manager | 0.5 | $4,593 | $2,297 | $528 | $2,825 | |
| | | | | Personnel Subtotal: | | $44,311 |

**2. Travel:**

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Travel Subtotal: | | $0 |

| **3. Vehicle** | Months | $/Month | Miles | $/Mile | | |
|---|---|---|---|---|---|---|
| GSA Lease Pickup | 12 | 248.5 | 10,000 | 0.185 | $4,832 | |
| Vehicle Insurance | 12 | 124.08 | (billed for calendar year) | | $1,489 | |
| | | | | Vehicle Subtotal: | | $6,321 |

**4. Supplies & Equipment (Expense Items)**

| | | | | |
|---|---|---|---|---|
| Office Supplies/Equipment | | | | |
| miscellaneous office supplies | | | $200 | |
| postage | | | $95 | |
| printing / copying | | | $200 | |
| Field/Research Supplies/Equipment | | | | |
| Non-office supplies | e.g., hardware, seed, other materials | | $5,000 | |
| Minor equipment and Tools | e.g, hand tools | | $406 | |
| Major Equipment | none | | $500 | |
| Equipment maintenance & repair | | | $375 | |
| Automotive fuel (12 months) | | | $400 | |
| Equipment fuels (ATV, chainsaw; 12 months) | | | $300 | |
| | | Supplies/Equipment Subtotal: | | $7,476 |

**5. Rent / Utilities**

| | | | | |
|---|---|---|---|---|
| Electricity | | | $1,950 | |
| Sanitation | | | $500 | |
| Building maintenance | | | $0 | |
| Buildings Insurance | 12 mo. | $50 | $600 | |
| Telephone & Internet services | | | $2,500 | |
| | | Rent/Utilities Subtotal: | | $5,550 |

**6. Other fees**

| | | | |
|---|---|---|---|
| Legal fees | Total: | $0 | |

| | | | | |
|---|---|---|---|---|
| | | Other Fees Subtotal: | | $0 |
| **7. Capital Equipment** | | | | |
| | | Capital Equipment Subtotal: | | $0 |
| **8. Sub-contracts (See attached Overview)** | | | | |
| Basin wildrye seed propagation, final contract payment | | | **$3,000** | |
| Streamgage & weather station cost-share with USGS | | | **$12,870** | |
| Helicopter- game survey | | | **$2,200** | |
| Field restoration preparation and seeding | | | **$8,000** | |
| Noxious Weed Control | | | **$12,500** | |
| | | Subcontracts Subtotal: | | $38,570 |
| **9. Indirect** | Rate | Subtotal | | |
| Percentage Rate Applied to Items 1-6 | 39.70% | $63,658 | | $25,272 |
| | | **CONTRACT TOTAL:** | | **$127,500** |

| | | |
|---|---|---|
| NWPPC Recommended FY04 Base Pine Creek: | $121,722 | |
| NWPPC Recommended FY04 Base Wagner | $33,000 | |
| Total Approved Outyear Funds: | | $154,722 |
| BPA approval of FY04 funding equal to old FY03 NPCC Rec.: | | $152,250 |
| FY03 expenses charged to FY04 amount: | | $24,750 |
| Remaining amount: | | $127,500 |

## WORK SCHEDULE

BPA Project 1998-022-00
Contract XXXX
Contract Period OCT 2003 - SEP 2004

| | Estimated Budget by Objective | TASK DISTRIBUTION BY MONTH | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2003 | | | 2004 | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| **Objective 1** | $35,303 | | | | | | | | | | | | |
| Task 1.1 | $14,893 | X | X | X | X | X | X | X | X | X | X | X | X |
| Task 1.2 | $2,023 | | | | | | X | | | | | | X |
| Task 1.3 | $1,012 | | | | | | | X | | | | | |
| Task 1.4 | $7,258 | X | X | | X | | | | | | | | |
| Task 1.5 | $8,093 | X | X | X | X | X | X | X | X | X | X | X | X |
| Task 1.6 | $2,023 | X | X | X | X | X | X | X | X | X | X | X | X |
| **Objective 2** | $17,424 | | | | | | | | | | | | |
| Task 2.1 | $7,841 | X | X | X | X | X | | | | | | | |
| Task 2.2 | $871 | X | X | X | X | X | X | X | X | X | X | X | X |
| Task 2.3 | $5,227 | X | X | X | X | | | | | | | | |
| Task 2.4 | $1,742 | | | | X | X | X | X | X | | | | |
| Task 2.5 | $1,742 | | | | X | X | | | | | | | |
| **Objective 3** | $67,553 | | | | | | | | | | | | |
| Task 3.1 | $18,013 | X | X | | | | X | X | X | X | X | X | X |
| Task 3.2 | $25,216 | X | X | X | X | X | X | X | X | X | X | X | X |
| Task 3.3 | $5,405 | | X | X | X | X | X | X | | | | | |
| Task 3.4 | $2,703 | X | X | X | X | X | X | X | X | X | X | X | X |
| Task 3.5 | $10,811 | X | X | X | X | X | X | X | X | X | X | X | X |
| Task 3.6 | $2,703 | X | X | X | X | X | X | X | X | X | X | X | X |
| Task 3.7 | $2,703 | X | X | X | X | X | X | X | X | X | X | X | X |
| **Objective 4** | $5,597 | | | | | | | | | | | | |
| Task 4.1 | $5,597 | X | X | X | X | X | X | X | X | X | X | X | X |
| **Objective 5** | $1,623 | | | | | | | | | | | | |
| Task 5.1 | $1,217 | X | | | X | | | X | | | X | | |
| Task 5.2 | $406 | X | | | | | | | | | | | |
| Task 5.3 | | | | | | | | | | | | | |
| Total Budget | **$127,500** | | | | | | | | | | | | |

# Appendix G. FY2004 Scope of Work

Identify Carry-over Funds

No carry-over funds are included in this contract. However, this contract amount has been reduced by $24,750 due to this amount having been spent in FY03 on three subcontracts.

ISRP Declaration

This FY 2004 budget request is out-year funding for Pine Creek Conservation Area, which was reviewed as Pine Creek Ranch and Wagner Ranch by the ISRP in the Columbia Plateau Provincial Review.

NEPA Documentation

Pine Creek Conservation Area actions are covered under BPA's wildlife mitigation programmatic EIS. Coordination has occurred with Nancy Weintraub.

ESA Coordination

Pine Creek Conservation Area actions are covered under BPA's wildlife mitigation programmatic EIS. Coordination has occurred with Nancy Weintraub.

Overview of Subcontracts

Basin wildrye seed propagation $3000

Final (third annual) payment to L&H Seed.

Streamgage & weather station cost-share with USGS $12,870

USGS cost-share will be available for FY04, $12870 is the Tribes' portion of the shared project.

Helicopter- game survey $2200

Contracted to Valley Helicopter, Asotin, WA; helicopter service used to fly Conservation Area and classify big game herd composition. Estimated cost based on 4 hours at $550 per hour. Contractor selected based on experience, knowledge of Conservation Area, and shared travel time with flight to survey Warm Springs Reservation.

Field restoration preparation and seeding $8,000

Seed floodplain abandoned agricultural fields with bunchgrass seed mix, in conjunction with plantings for CREP riparian buffer project.

Abandoned agricultural fields on Pine Creek floodplains are currently dominated by annual grasses and other weeds. The CREP riparian buffer project provides funding to plant native bunchgrasses in a riparian buffer along the creek. The buffer width does not include the entire abandoned agricultural fields. This subcontract funding will be used to plant the remaining field areas simultaneously with the CREP buffer zone. The estimated field area to be planted outside of the buffer zone is approximately 67 acres, at an estimated cost per acre of $150 the total cost is $10,050. The $8000 requested here is due to the limited funding currently available from BPA; if adequate funds become available this amount will be increased.

Noxious Weed Control $12,500

Subcontract with County Weed Officers from Wheeler or Jefferson County. Conduct monitoring and treatment of noxious weeds using mechanical, chemical, and biological control as appropriate and in accord with the draft Weed Management Plan. The $12,500 funding level is comparable to the cost of recent year's efforts.

Legal fees

Legal fees are not included in this contract. This budget item is intended as a contingency in the event that attorney consultation is required due to unforeseen circumstances during the contract period. In a project of this scope and complexity, attorney consultation is a likely ongoing need. However, this scope of work is for a minimal budget in FY04 and therefore does not include a legal fee contingency.

Computer needs

No new computer hardware needs are identified in the FY2004 contract.

Equipment inventory (major items over $10,000): None.

Identify Travel & Training Costs

No travel and training funding is included in the current contract.