



Silver Creek Subbasin Assessment

Prepared by the Harney
County Watershed Council

Silver Subbasin Assessment

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CHAPTER ONE

Introduction

The purpose of this document is to provide a basis for future watershed management plans. The Silver Creek Subbasin Assessment will serve as a planning tool for the Harney County Watershed Council (HCWC) and others.

This assessment was developed as an agreed upon action with the Oregon Watershed Enhancement Board (OWEB) as outlined in a grant to the HCWC.

The Harney County Watershed Council was officially recognized by the Harney County Court in June of 1997. The membership is diverse and well representational of the area. Because it is located in a sparsely populated area most of the members have many roles and affiliations within the communities. Out of 20 voting members 5 are employed by government agencies. Four additional agency representatives are nonvoting advisory members. The most common primary affiliation of council members is ranching, and these individuals are well dispersed throughout the County.

The Council enjoys the active involvement of the following entities: private land owners, Oregon Water Resources Department, Harney County Court, USDI Bureau of Land Management, Burns Paiute Tribe, OWEB, USDA Forest Service, Izaak Walton League, Malheur National Wildlife Refuge, Oregon Department of Environmental Quality, U.S. Fish and Wildlife Service, USDA Farm Service Agency, Oregon Department of Fish and Wildlife, Harney Soil and Water Conservation District, Oregon State University, USDA Natural Resources Conservation Service, USDA Agricultural Research Service, and the Malheur Lake Basin Working Group.

The purpose of the Harney County Watershed Council is to address issues and concerns about watershed health in Harney County and to promote existing good and beneficial conditions. The Council will provide a framework for education, coordination, and cooperation among all interested parties for the development and implementation of watershed action plans beneficial to the people and the environment.

The Council recognizes that local economic and ecological prosperity is dependant upon the current and future availability and quality of water; therefore, the Harney County Watershed Council is committed to this three-part goal:

1. Determine the health of individual watersheds or watershed segments.
2. Retain the health of high quality watersheds.
3. Restore and enhance those watersheds, or portions thereof, that can be improved.

Figure 1.1 - Silver Creek Subbasin Description

Subbasin Description Size and Location

The Silver Creek Subbasin is located in the northwest corner of Harney County with a very small portion extending into Lake County. It is contained in the Malheur Lake Basin and is designated by USGS Hydrologic Unit Code (HUC) 17120004. It is approximately 1,700 square miles in size.

Landownership is as follows:

<u>Ownership</u>	<u>Acres in Harney County</u>
<u>Public Lands Managed By:</u>	
USDA Forest Service	147,262
U.S. Fish and Wildlife Service	20,574
Bureau of Land Management	690,667
ARS and OSU (NGBER, The Butte and Section 5)	14,069
State of Oregon	55,410
<u>Private Land</u>	<u>147,766</u>
Total Acres in Harney County	1,075,748

Figure 1.2 – Silver Creek Subbasin Location

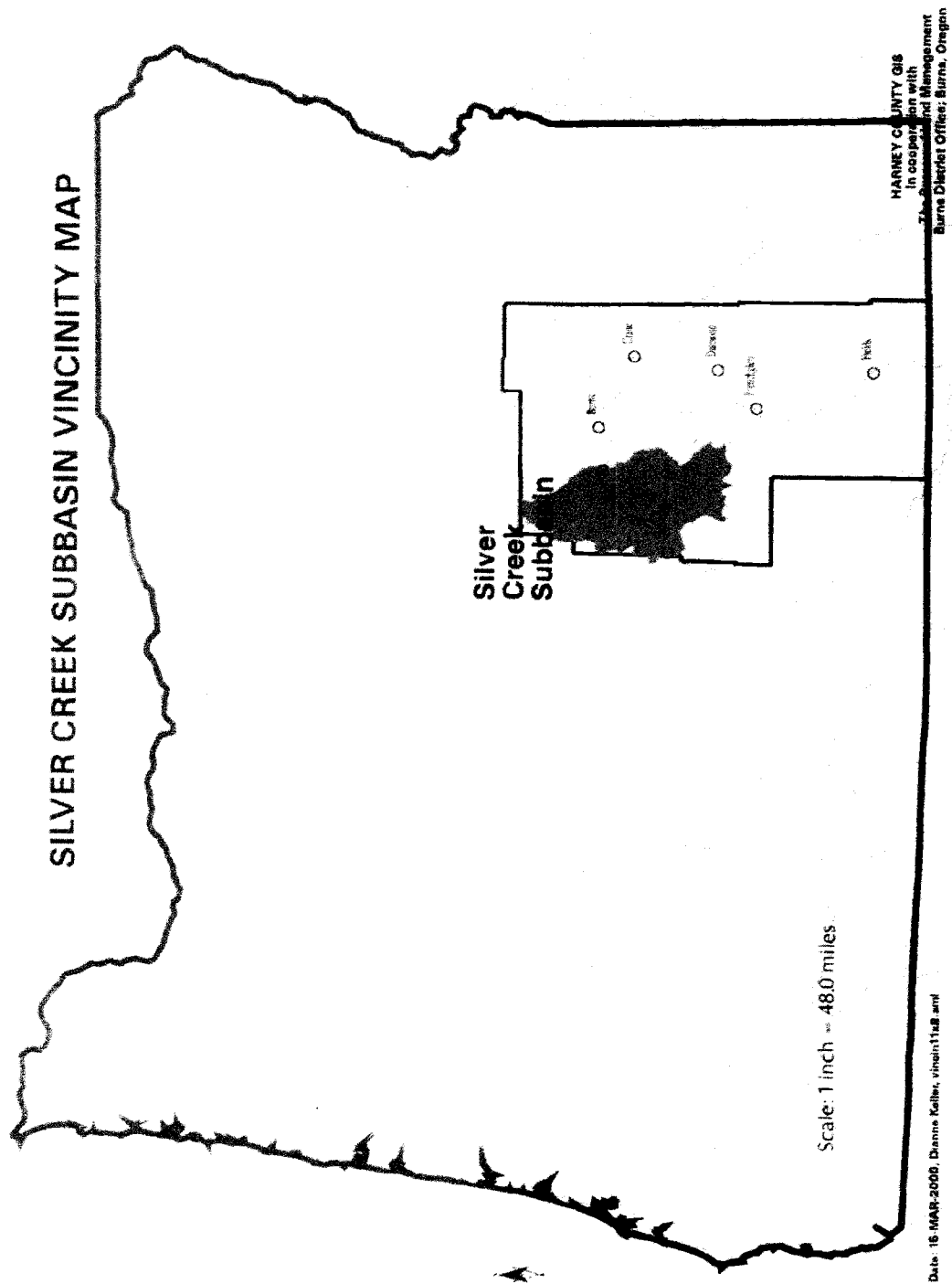
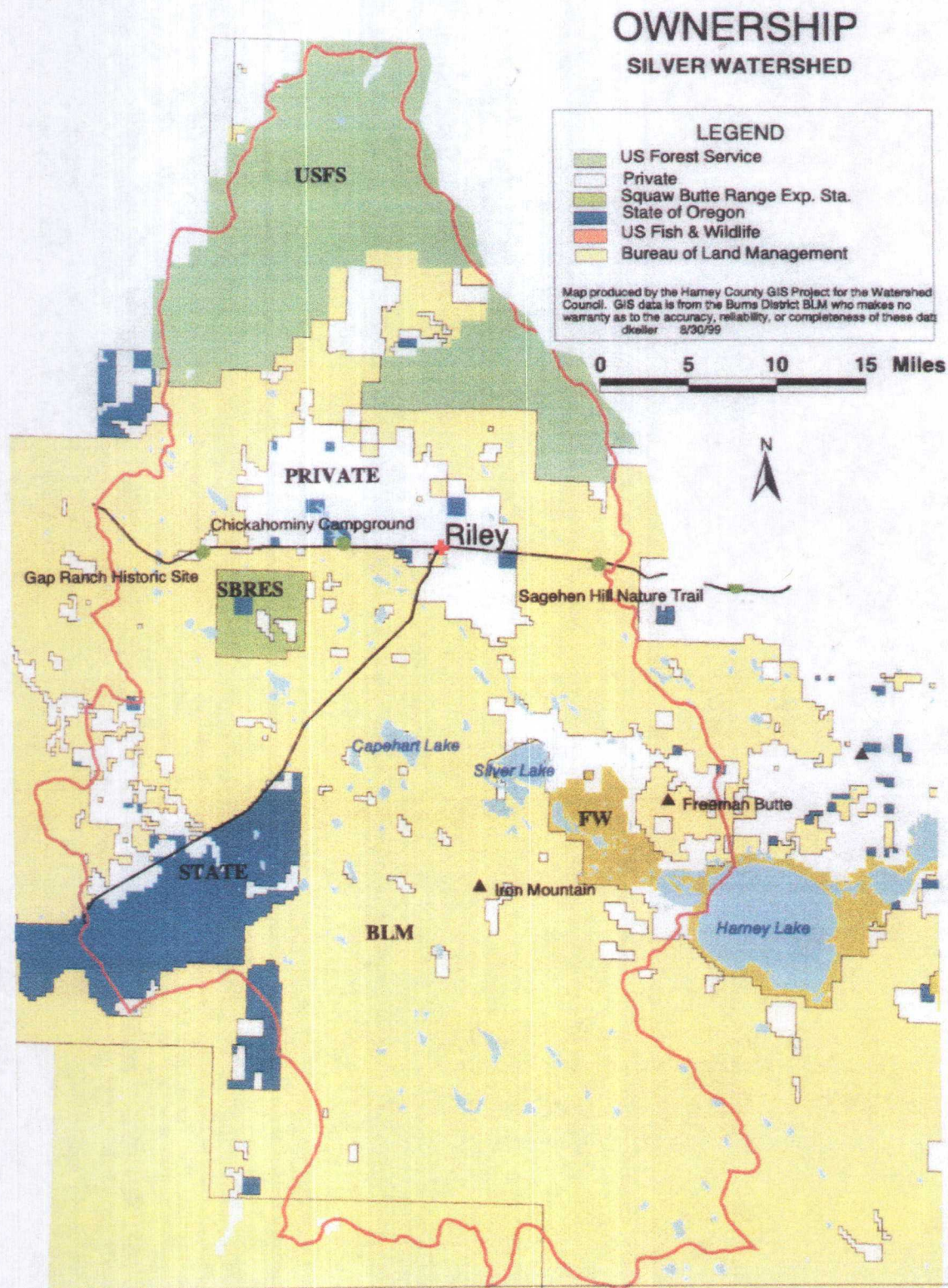


Figure 1.3 – Silver Creek Subbasin Land Ownership



CHAPTER TWO

Present Conditions and Background

GEOLOGY

The watershed is located on the southern and eastern edge of the Blue Mountains physiographic province that also includes the Wallowa, Elkhorn, and Strawberry Mountains (Orr, Orr and Baldwin, 1992). The watershed drains into the transitional zone between the High Lava Plains of the Great Basin physiographic province that includes the Pleistocene lakes of Harney and Malheur. Harney Basin is a large closed depression. A variety of ash flow tuffs, tuffaceous sediments, and lava flows covered the basin in the late Cenezoic (Greene, Walker, and Corcoran, 1972). Many of the flows which covered the Silver Creek watershed had their source within the High Lava Plains. Silver Creek and its tributaries all drain into Malheur Lake Basin. During the late Pleistocene, within the last 11,000 years, the Malheur Lake Basin drained through a low gap at the base of the Stinkingwater Mountains into the Malheur River, which drains into the Snake and Columbia River Basins.

The tectonic movement, uplift of the Blue Mountain anticline and past mass wasting processes have combined to create broad ridges, moderately steep draws and flat valleys. Today's mass wasting processes are primarily sheet and rill erosion, talus slopes, rock topple, and a few visible dormant slides. The watershed was capped with Mt. Mazama ash (Walker and MacLeod, 1991). The ashfall occurred around 7,000 years ago. The ash has enhanced the fertile environment of the existing soils. The development of the timbered draws and broad open ridges is the product of the underlying geology, tectonic, and surface processes. The watershed is presently characterized by broad dissected plateau tops, upland flats, rolling hill slopes, moderate to steep drainage escarpment, draw bottoms, and wide valley bottoms.

HYDROLOGY:

The Silver Creek area in the northwestern part of the Malheur Lake Basin comprises all drainage into Harney Lake west of the Narrows, an area of land separating Harney and Malheur Lakes.

The upper Silver Creek drainage area includes about 332,500 acres. Claw, Dairy, Sawmill, and Nicoll Creeks drain the southern portion of the Ochoco National Forest where the most dependable summer flows are encountered. Silver Creek flows south into Moon Reservoir then on through Warm Springs Valley and on into Harney Lake.

The lower elevation tributaries have intermittent flows. Valley lands in the vicinity of Claw Creek, Riley, and Warm Springs Valley are used for irrigated agriculture.

Water in Silver Creek is divided, in flood stage, at the upper end of Warm Springs Valley so that a part of the flow continues in a southerly direction along the eastern side of Warm Springs Valley, then east to Harney Lake. The bed of Silver Lake typically is dry except for some small pools supplied by springs at the northern and western edges of the lakebed.

When filled to the point of overflowing, Silver Lake covers an area of about 4,000 acres and has a maximum depth of 4 to 6 feet.

The Wilson and Buzzard Creek areas south and west of Harney Lake have an area of about 500,000 acres contributing to the lake, but due to the character of the watersheds the runoff is very low in average years, and during minimum years no runoff reaches Warm Springs Valley. Occasionally, flood flows are sufficient to fill various mud flats west of the Warm Springs Valley and then overflow into Silver Lake. The erratic character of this runoff is such that it probably cannot be considered a reliable source of irrigation supply, but flood control measures are desirable on these intermittent drainages in connection with the development of the Warm Springs Valley.

Elliot Canyon and adjoining tributaries drain mainly desert and rangelands having a low-water yield capability. These streams generally flow only during spring snowmelt.

Harney Lake and Malheur Lake are linked at the "Narrows" on Highway 205. These two lakes comprise the terminus of the Malheur Lake Basin drainage. Harney Lake is deeper than Malheur Lake and has comparatively steep shores. Fluctuation of its water surface area varies around an average of 30,000 acres. Harney Lake is largely independent of the altitude of Malheur Lake and the water level may be as much as 10 feet lower.

Stream Channels: In 1964 there was a severe rain-on-snow event that channelized most of the streams in the subbasin. Since that time the streams in the watershed have rehabilitated to various degrees. The proper functioning condition surveys on BLM lands demonstrate some of the improvement (Burns District BLM Ecological Site Index). There is inadequate information to determine the level of improvement that has taken place in the headwaters on Forest Service land and on private lands (Silver Creek Watershed Assessment, USFS 1998). Even though there has been improvement, most of the streams have segments needing continued rehabilitation (Burns District BLM Ecological Site Index). The lower stretch of Silver Creek has been altered for agricultural purposes and wildlife refuge management. There are numerous diversions that facilitate irrigation and wildlife ponding.

The BLM evaluated four sites on 8.17 miles of Silver Creek on public lands for Proper Functioning Conditions (PFC) with the following results:

Properly Functioning	5.62 miles
Functioning At-Risk with an Upward Trend	0.95 miles
Nonfunctioning	1.60 miles

Stream Temperature: Stream temperatures fluctuate widely throughout the year. Most of the streams in the watershed do not meet current State water quality temperature standards during the summer months of July thru September. This may be a function of stream width/depth/gradient ratio and vegetative shading. Oregon State University Range Department studies are ongoing to determine the affect of these factors on stream temperature mechanics.

Riparian Vegetation: The quantity and quality of vegetation along the streams in the watershed ranges from poor to excellent with most stretches being in less than excellent condition (Burns District BLM Ecological Site Index). Additional information needs to be collected on both private and federal land. Some species such as aspen are no longer represented in areas they once occupied.

Water Uses: Most of the water in the Silver Creek subbasin is used for agricultural purposes, primarily irrigation. Moon Reservoir and Chickahominy Reservoir are the two largest reservoirs in the watershed, collecting most of the water in the subbasin. A variety of recreation activities take place at both reservoirs including fishing, boating, camping and waterfowl hunting. There are five dams in the Silver Creek Subbasin, Chickahominy Creek, Faye Canyon Reservoir, Moon Reservoir, Zoglman, and Delintment. With the exception of Delintment, which is used for recreation, all dams are used for irrigation (National inventory of dams 1993-1994).

Water Quality Limited Streams - 303(d) List (DEQ 1998)

There are 171 stream miles in the Silver Creek Subbasin. The following streams are listed for exceeding the 7-day average of daily maximums for temperature in the summer.

Claw Creek	Mouth to headwaters
Egypt Creek	Mouth to headwaters
Nicoll Creek	Mouth to headwaters
Rough Creek	Mouth to headwaters
Salt Canyon Creek	Mouth to headwaters
Sawmill Creek	Mouth to headwaters
Silver Creek	Moon Reservoir to headwaters
Wickiup Creek	Mouth to Mineral Creek

VEGETATION:

Uplands, especially in the headwater regions, in the subbasin are primarily forested; with ponderosa pine, white fir, Douglas fir and western juniper being the dominant species. Below the forested uplands in the non-forested rangelands, the vegetative communities are a variety of brush/grass community types.

Due to the suppression of fire and other human activities during the past 50 years, western juniper, and to a lesser extent ponderosa pine, have encroached and become dominant on areas that were previously shrub/grass communities.

The health and productivity of the vegetative communities in the Subbasin vary greatly across all ownerships from poor to excellent. Many forested stands are over stocked and are susceptible to insects and disease and high intensity wildfires. Some rangelands are in poor condition and not at their productive capacity. The amount of rangeland and timberland in less than desirable condition needs to be determined.

The following sensitive plant species are known or suspected to occur in the Silver Creek subbasin:

Common Name	Scientific Name
wild onion	<i>Allium campanulatum</i>
moonwort, variety	<i>Botrychium ascendens</i>
moonwort, variety	<i>Botrychium crenulatum</i>
moonwort, variety	<i>Botrychium lanceolatum</i>
moonwort, variety	<i>Botrychium minganense</i>
moonwort, variety	<i>Botrychium pinnatum</i>
moonwort, variety	<i>Botrychium paradoxum</i>
mariposa lily	<i>Calochortus longebarbatus</i> var. <i>peckii</i>
lady's slipper	<i>Cypripedium calceolus</i> var. <i>parviflorus</i>
monkey flower	<i>Minulus washingtonensis</i>

Several noxious weeds have been identified in the subbasin (see appendix A). At present no major noxious weed problems have been identified. However, it will take continued monitoring and treatment to keep the weeds in check. Perennial pepperweed (*Lepidium latifolium*) is becoming a problem in some areas of the basin, as is knapweed. This species invades the more productive sites, including wetlands and riparian zones.

FISH:

Several native and introduced species of fish are found in the subbasin (see appendix B). Rainbow trout can be found in several of the water bodies in the subbasin. For the

subbasin in general, the quality of fish habitat is substantially below the stream systems potential (Burns District BLM Ecological Site Index). Specific habitat features needing improvement include greater quantities of large woody material, pool quality and quantity, and additional riparian vegetation. Many of the diversions also affect the quality of fish habitat by limiting fish movement for spawning and rearing. Improvements in fish habitat are needed on all ownerships.

No threatened or endangered fish are known to exist within the subbasin.

Trout stocking was discontinued in Silver Creek and tributaries in 1974. Reservoirs continue to be stocked with nonnative rainbow trout.

WILDLIFE:

The subbasin provides habitat for a wide variety of animals (see appendix C). Some of the special habitats found in the subbasin include aspen, mountain mahogany, and old growth ponderosa pine forest. Many of the low lands are winter range for deer, elk, and antelope. A large portion of these lands are private. Some of the private lands that are managed for agricultural crops are experiencing damage from big game animals, primarily elk.

No threatened or endangered animal species are known to inhabit the subbasin.

HUMAN USES:

A wide variety of human uses have taken place in the Silver Creek subbasin. These include timber harvesting, livestock grazing, crop agriculture, mining, and recreation. Today, livestock grazing, crop agriculture and recreation are the primary uses in the area. Human uses have had a major impact, both positive and negative, on the subbasin over time. Tribal uses of the subbasin, such as food gathering, are recognized.

CLIMATE

The National Weather Service has extensive records from two weather stations in the Silver Creek Subbasin. They are Squaw Butte and Suntex (see monthly climate summaries that follow) as well as a monthly precipitation chart from the Northern Great Basin Experimental Range (formerly known as Squaw Butte) averaged over a 50-year period from 1949 to 1999.

Approximately 60% of the precipitation comes from October to March inclusive, in the form of snow, which usually remains all winter on the high timbered mountain slopes but frequently disappears after each snowstorm in the open valleys.

Farming efforts are exasperated by a short growing season. For example the Burns area has 61 days per year with nighttime temperatures greater than 32 degrees (NOAA 1999).



Chickahominy Reservoir

Figure 2.1- Climate Summaries

SQUAW BUTTE EXPERIMENT, OREGON (358029)

Period of Record Monthly Climate Summary

Period of Record : 1/3/1937 to 7/31/1998

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	35.1	40.8	46.9	56.2	64.6	73.1	83.9	82.8	74.2	61.9	45.8	37.6	58.6
Average Min. Temperature (F)	17.0	21.5	24.9	29.5	36.0	42.6	49.7	48.8	42.1	33.7	25.3	19.8	32.6
Average Total Precipitation (in.)	1.41	0.99	1.01	0.82	1.30	1.06	0.36	0.59	0.53	0.91	1.20	1.41	11.58
Average Total SnowFall (in.)	12.6	6.6	4.3	1.4	0.3	0.1	0.0	0.0	0.1	0.6	5.0	9.0	39.9
Average Snow Depth (in.)	4	3	1	0	0	0	0	0	0	0	1	2	1

Western Regional Climate Center, wrcc@dri.edu

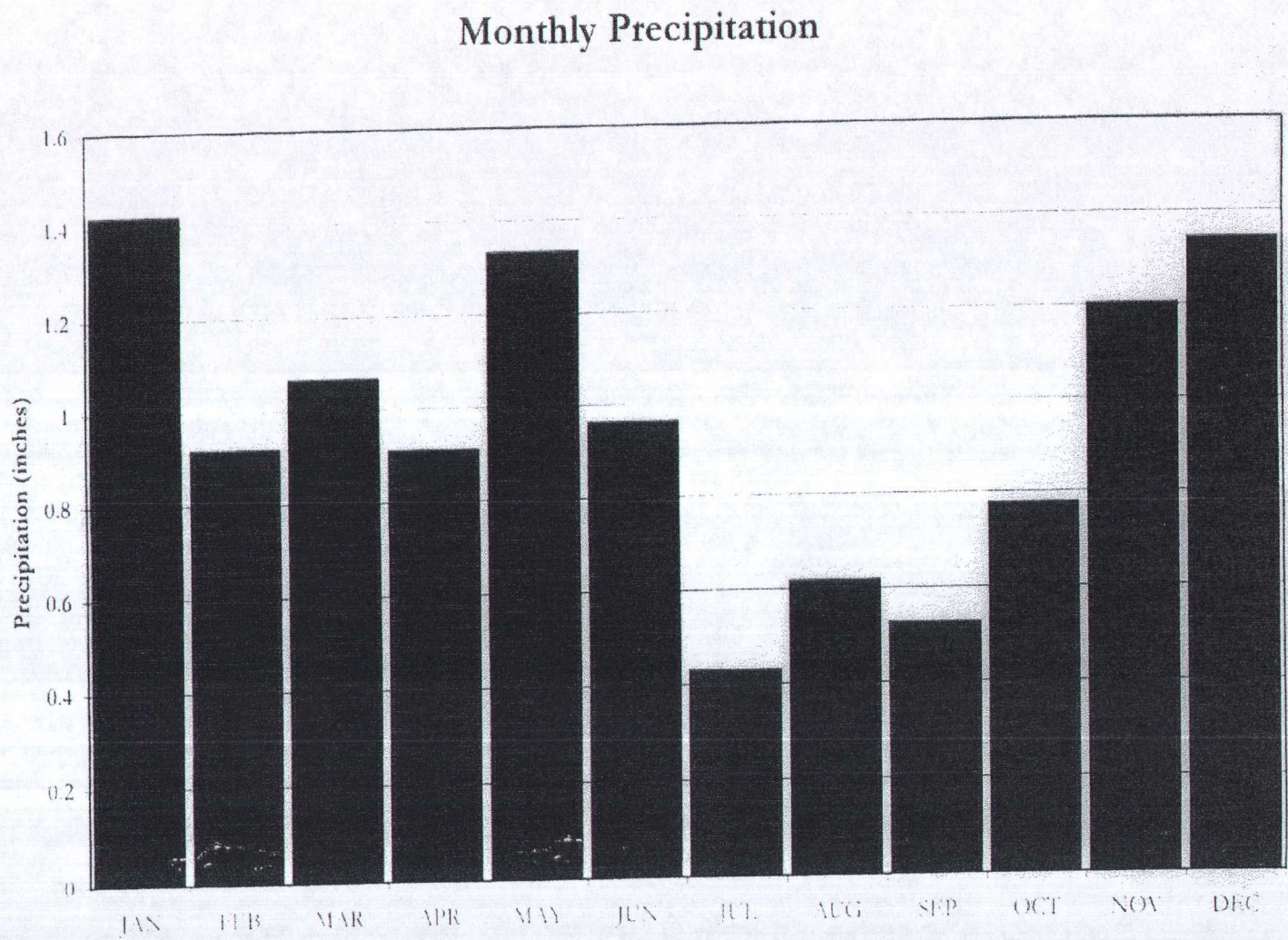
SUNTEX, OREGON (358250)

1961-1990 Monthly Climate Summary

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	35.2	41.3	49.0	57.4	65.6	74.6	83.2	83.1	74.4	62.5	44.4	35.9	59.1
Average Min. Temperature (F)	14.4	19.6	24.6	29.0	34.4	40.9	45.0	43.7	36.1	28.9	22.6	15.9	29.7
Average Total Precipitation (in.)	0.86	0.72	0.77	0.65	0.90	0.78	0.42	0.59	0.66	0.77	1.22	1.11	9.46

Unofficial values based on averages/sums of smoothed daily data. Information is computed from available daily data during the 1961-1990 period. Smoothing, missing data and observation-time changes may cause these 1961-1990 values to differ from official NCDC values. This table is presented for use at locations that don't have official NCDC data. No adjustments are made for missing data or time of observation. Check NCDC normals table for official data.

Figure 2.2 – Average Monthly Precipitation Chart



CHAPTER THREE

Local Watershed Issues

The Council consulted with the various landowners in the subbasin and the various land management agencies and identified the following key issues in the Silver Creek Subbasin:

Issue 1: Identification of specific stream reaches or upland conditions contributing to poor water quality in the Silver Creek Subbasin.

Issue 2: Identify actions needed to get 303(d) listed streams delisted and identify natural causes contributing to listing.

Issue 3: Identification of opportunities to improve fish movement for native species within the existing stream systems supporting fish.

Issue 4: Provide for high quality sage grouse habitat.

Issue 5: Actions needed to prevent noxious weed infestations detrimental to the watershed and to keep existing infestations under control.

Issue 6: Develop fuel inventories in forested areas.

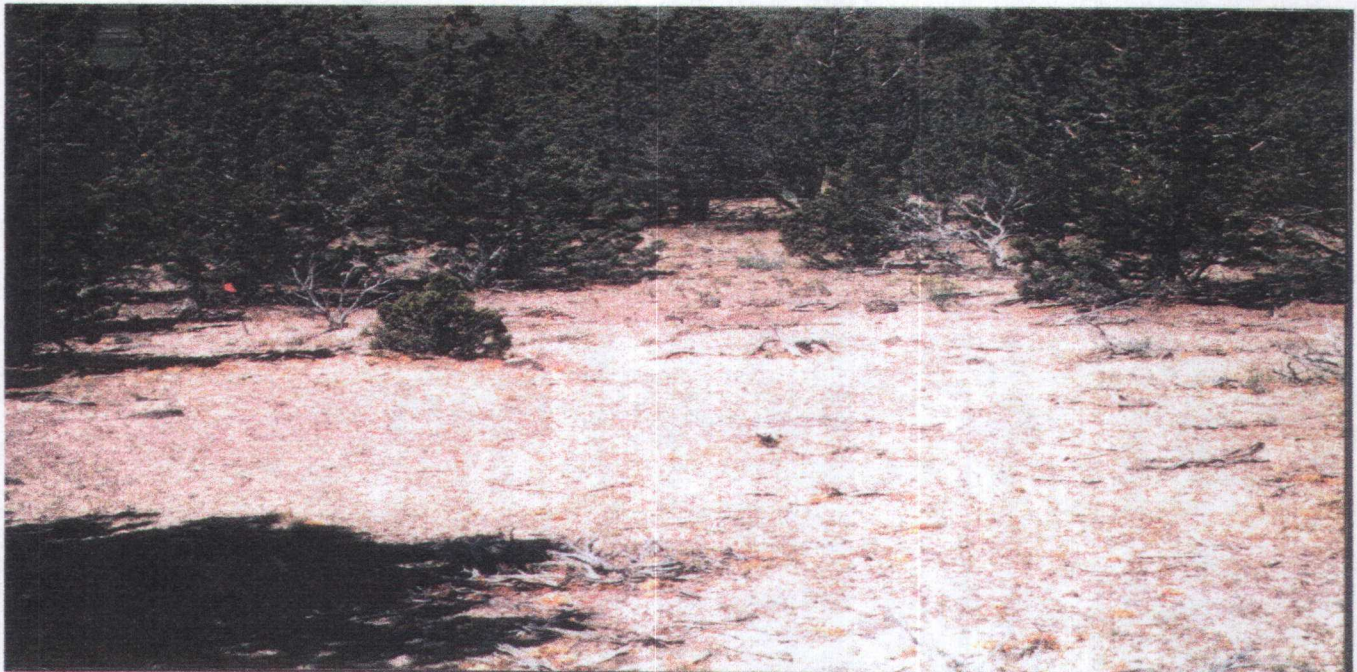
Issue 7: Identify actions needed to control juniper encroachment.



CHAPTER FOUR

Goals

1. Implement actions that enhance positive management and rehabilitate areas that are debilitating all ownerships.
2. Get 303(d) listed streams in the subbasin delisted.
3. Improve fish passage in the subbasin stream systems. Control movement of non-native fish where necessary.
4. Keep noxious weeds at manageable levels.
5. Manage lands for efficient retention and use of precipitation and water in the watershed. Increase in use efficiency of annual precipitation through an increase in annual biomass production of desirable plant species.
6. Reduce fuel loads in pine forests to improve understory growth and prevent catastrophic fire.
7. Manage juniper to provide for enhanced watershed environments.



Juniper Stand

CHAPTER FIVE

Recommendations

1. Conduct information gathering to identify less than desirable conditions. Combine information from all ownerships.
2. Develop project plans to implement corrective actions for the problem areas identified in recommendation #1.
3. Control invading juniper trees and other undesirable shrubs in uplands and riparian areas to improve watershed function and restore riparian vegetation.
4. Develop stream management plans across ownerships for presentation to DEQ in order to get 303(d) streams delisted.
5. Promote land use practices that reduce or avoid undesirable conditions
6. Encourage development of a weed inventory and treatment plan for the basin.
7. Identify and improve migratory fish passage.
8. Identify education opportunities for private landowners and the public that promote sound watershed management practices.



APPENDIX A

Harney County Noxious Weeds

A Rated Weeds (infestations are subject to eradication where found)

Common Name	Scientific Name
tansy ragwort	<i>Senecio jacobaea</i>
diffuse knapweed	<i>Centaurea diffusa</i>
spotted knapweed	<i>Centaurea maculosa</i>
squarrose knapweed	<i>Centaurea virgata</i>
yellow star thistle	<i>Centaurea solstitialis</i>
purple loosestrife	<i>Lythrum salicaria</i>
leafy spurge	<i>Euphorbia esula</i>
rush skeletonweed	<i>Chondrilla juncea</i>
scotch broom	<i>Cytisus scoparius</i>
salt cedar	<i>Tamarix ramosissima</i>
musk thistle	<i>Cardus nutans</i>
yellow toadflax	<i>Linaria vulgaris</i>

B Rated Weeds (infestations are handled at county discretion)

Common Name	Scientific Name
perennial pepperweed	<i>Lepidium latifolium</i>
scotch thistle	<i>Onopordum acanthium</i>
puncture vine	<i>Tribulus terrestris</i>
dalmatian toadflax	<i>Linaria dalmatica</i>
russian knapweed	<i>Centaurea repens</i>
medusahead rye	<i>Taeniatherum caput-medusa</i>
mediterranean sage	<i>Salvia aethiopis</i>

C Rated Weeds (infestations are handled at landowners discretion)

Common Name	Scientific Name
klamath weed	<i>Hypericum perforatum</i>
morning glory	<i>Convolvulus arvensis</i>
canada thistle	<i>Cirsium arvense</i>
white top	<i>Cardaria draba</i>
halogeton	<i>Halogeton spp.</i>

APPENDIX B

Warmwater Game Fish

There are several species of nonnative warmwater game fish in the basin. Most reside in Moon Reservoir but a few wash out of the reservoir and a few live in the intermittent reaches of Silver Creek and associated irrigation canals between the dam and Harney Lake. They have been stocked to provide a sport fishery in the reservoir.

Native Nongame Fish

There are a number of native nongame fishes in the basin. Except for the tui chub, they are all species common to the rest of the Harney Basin and the Snake River. Some, such as the speckled dace and redbase shiner, are found in the lower gradient part of the watershed where stream temperatures are warm during the summer months. Some, like the mottled sculpin, are found in the transition area between the colder water and steep gradient of the upper watershed and the slower, warmer, lower gradient part of the drainage. Species like the long-nosed dace associated with trout are found in the upper part of the watershed where gradient is steeper and summer temperature is cooler. The nongame fish of the basin are common in the areas with the appropriate habitat. In the fish surveys of 1988 and 1998 the various species were recorded in several length size groups indicating several age classes and were locally abundant indicating healthy populations.

FISH SPECIES OF THE SILVER CREEK BASIN

Native Fish

<u>Common Name</u>	<u>Scientific Name</u>
redband trout	<i>Oncorhynchus mykiss newberii</i>
mottled sculpin	<i>Cottus bairdi</i>
redside shiner	<i>Richardsonius balteatus</i>
longnose dace	<i>Rhinichthys catarcactae</i>
speckled dace	<i>Rhinichthys asculus</i>
bridgelip sucker	<i>Catostomus columbianus</i>
tui chub	<i>Gila bicolor</i>

Introduced Fish

<u>Common Name</u>	<u>Scientific Name</u>
rainbow trout	<i>Oncorhyncus mykiss</i>
largemouth bass	<i>Micropterus salmoides</i>
bluegill	<i>Lepomis macrochirus</i>
pumpkinseed	<i>Lepomis gibbosus</i>
yellow perch	<i>Perca flavescens</i>



APPENDIX C

The following species are likely to reside within the Silver Creek Subbasin

Mammals

Common Name	Scientific Name
pygmy rabbit	<i>Sylvilagus idahoensis</i>
Nuttall's cottontail	<i>Sylvilagus nattallii</i>
white-tailed jackrabbit	<i>Lepus townsendii</i>
black-tailed jackrabbit	<i>Eutamias minimus</i>
yellow-bellied marmot	<i>Marmota flaviventris</i>
white-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>
Townsend's ground squirrel	<i>Spermophilus townsendii</i>
Belding's ground squirrel	<i>Spermophilus beldingi</i>
Townsend's pocket gopher	<i>Thomomys townsendii</i>
Great Basin pocket mouse	<i>Perognathus parvus</i>
Ord's kangaroo rat	<i>Dipodomys ordii</i>
Great Basin kangaroo rat	<i>Dipodomys microps</i>
beaver	<i>Castor Canadensis</i>
western harvest mouse	<i>Reithodontomys megalotis</i>
deer mouse	<i>Peromyscus maniculatus</i>
canyon mouse	<i>Peromyscus crinitus</i>
northern grasshopper mouse	<i>Onychomys leucogaster</i>
desert woodrat	<i>Neotoma lepida</i>
bushy-tailed woodrat	<i>Neotoma cinerea</i>
sagebrush vole	<i>Lagurus curtatus</i>
montane meadow mouse	<i>Micotus montanus</i>
muskrat	<i>Ondatra zibethicus</i>
porcupine	<i>Erethizon dorsatum</i>
coyote	<i>Canis latrans</i>
red fox	<i>Vulpes vulpes</i>
raccoon	<i>Procyon lotor</i>
long-tailed weasel	<i>Mustela frenata</i>
mink	<i>Mustela vision</i>
badger	<i>Taxidea taxus</i>
western spotted skunk	<i>Spilogale gracilis</i>
striped skunk	<i>Mephitis mephitis</i>
bobcat	<i>Felis rufus</i>
mule deer	<i>Odocoileus hemionus</i>
pronghorn antelope	<i>Antilocapra americana</i>

Rocky Mountain elk	<i>Cervus canadensis</i>
cougar	<i>Felis concolor</i>
lynx	<i>Felis lynx</i>
black bear	<i>Ursus americanus</i>
wild horse	

Birds

Common Name	Scientific Name
pied-billed grebe	<i>Podilymbus podiceps</i>
curlew	<i>Podilymbus nigricollis</i>
western grebe	<i>Aechmophorus occidentalis</i>
Clark's grebe	<i>Aechmophorus clarkii</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>
double-crested cormorant	<i>Phalacrocorax auritus</i>
American bittern	<i>Botaurus lentiginosus</i>
great blue heron	<i>Ardea herodias</i>
great egret	<i>Ardea alba</i>
snowy egret	<i>Egretta thula</i>
black-crowned night heron	<i>Nycticorax nycticorax</i>
white face ibis	<i>Plegadis chihi</i>
turkey vulture	<i>Cathartes aura</i>
greater white-fronted goose	<i>Anser albifrons</i>
snow goose	<i>Chen caerulescens</i>
Ross' goose	<i>Chen rossii</i>
Canada goose	<i>Branta Canadensis</i>
tundra swan	<i>Cygnus colubianus</i>
gadwall	<i>Anas strepera</i>
Eurasian wigeon	<i>Anas penlope</i>
American wigeon	<i>Anas Americana</i>
mallard	<i>Anas platyrhynchos</i>
blue-winged teal	<i>Anas discors</i>
cinnamon teal	<i>Anas cyanoptera</i>
northern shoveler	<i>Anas clypeata</i>
northern pintail	<i>Anas acuta</i>
green-winged teal	<i>Anas crecca</i>
canvasback	<i>Aythya valisneria</i>
redhead	<i>Aythya americana</i>
ring-necked duck	<i>Aythya collaris</i>
lesser scaup	<i>Aythya affinis</i>
bufflehead	<i>Bucephala albeola</i>
common goldeneye	<i>Bucephala clangula</i>
Barrow's goldeneye	<i>Bucephala islandica</i>
common merganser	<i>Mergus merganser</i>

Birds (cont.)

ruddy duck	<i>Haliastur leucocephalus</i>
bald eagle	<i>Oxyura jamaicensis</i>
northern harrier	<i>Circus cyaneus</i>
Cooper's hawk	<i>Accipiter cooperii</i>
northern goshawk	<i>Accipiter gentilis</i>
Swainson's hawk	<i>Buteo swainsoni</i>
red-tailed hawk	<i>Buteo jamaicensis</i>
ferruginous hawk	<i>Buteo regalis</i>
rough-legged hawk	<i>Buteo lagopus</i>
golden eagle	<i>Aquila chrysaetos</i>
American kestrel	<i>Falco sparverius</i>
prairie falcon	<i>Falco mexicanus</i>
ring-necked pheasant	<i>Phasianus colchicus</i>
California quail	<i>Callipepla californica</i>
Virginia rail	<i>Rallus limicola</i>
sora	<i>Porzana carolina</i>
American coot	<i>Fulica americana</i>
sandhill crane	<i>Grus canadensis</i>
snowy plover	<i>Charadrius alexandrinus</i>
killdeer	<i>Charadrius vociferus</i>
black-necked stilt	<i>Ilimantopus mexicanus</i>
American avocet	<i>Recurvirostra americana</i>
greater yellowlegs	<i>Tringa melanoleuca</i>
lesser yellowlegs	<i>Tringa flavipes</i>
willet	<i>Catoptrophorus semipalmatus</i>
spotted sandpiper	<i>Actitis macularia</i>
long-billed curlew	<i>Nuemius americanus</i>
marbled godwit	<i>Limosa fedoa</i>
western sandpiper	<i>Calidris pusilla</i>
least sandpiper	<i>Calidris minutilla</i>
dunlin	<i>Calidris alpina</i>
long-billed dowitcher	<i>Limnodromus scolopaceus</i>
common snipe	<i>Gallinago gallinago</i>
Wilson's phalarope	<i>Phalaropus tricolor</i>
Franklin's gull	<i>Larus pipixcan</i>
Bonaparte's gull	<i>Larus philadelphia</i>
ring-billed gull	<i>Larus delawarensis</i>
California gull	<i>Larus californicus</i>
Caspian tern	<i>Sterna caspia</i>
Forester's tern	<i>Sterna forsteri</i>
black tern	<i>Chlidonias niger</i>
mourning dove	<i>Zenaida macroura</i>

Birds (cont.)

barn owl	<i>Tyto alba</i>
great horned owl	<i>Bubo virginianus</i>
burrowing owl	<i>Athene cunicularia</i>
short-eared owl	<i>Asio flammeus</i>
common nighthawk	<i>Chordeiles acutipennis</i>
common poorwill	<i>Phalaenoptilus nuttallii</i>
Vaux's swift	<i>Chaetura vauxi</i>
belted kingfisher	<i>Ceryle alcyon</i>
downy woodpecker	<i>Picoides pubescens</i>
hairy woodpecker	<i>Picoides villosus</i>
northern flicker	<i>Colaptes auratus</i>
willow flycatcher	<i>Empidonax traillii</i>
dusky flycatcher	<i>Empidonax oberholseri</i>
Say's phoebe	<i>Sayornis saya</i>
ash-throated flycatcher	<i>Myiarchus cinerascens</i>
western kingbird	<i>Tyrannus verticalis</i>
eastern kingbird	<i>Tyrannus tyrannus</i>
loggerhead shrike	<i>Lanius ludovicianus</i>
warbling vireo	<i>Vireo gilvus</i>
black-billed magpie	<i>Pica pica</i>
American crow	<i>Corvus brachyrhynchos</i>
common raven	<i>Corvus corax</i>
horned lark	<i>Eremophila alpestris</i>
tree swallow	<i>Tachycineta bicolor</i>
violet-green swallow	<i>Tachycineta thalassina</i>
n. rough-winged swallow	<i>Stelgidopterys serripennis</i>
bank swallow	<i>Riparia riparia</i>
cliff swallow	<i>Petrochelidon pyrrhonota</i>
barn swallow	<i>Hirundo rustica</i>
rock wren	<i>Salpinctes obsoletus</i>
canyon wren	<i>Catherpes mexicanus</i>
marsh wren	<i>Cistothorus palustris</i>
ruby-crowned kinglet	<i>Regulus calendula</i>
western bluebird	<i>Sialia mexicana</i>
American robin	<i>Turdus migratorius</i>
sage thrasher	<i>Oreoscoptes montanus</i>
European starling	<i>Sturnus vulgaris</i>
yellow warbler	<i>Dendroica petechia</i>
yellow-rumped warbler	<i>Dendroica coronata</i>
common yellowthroat	<i>Geothlypis trichas</i>
Wilson's warbler	<i>Wilsonia pusilla</i>
western tanager	<i>Piranga ludoviciana</i>

Birds (cont.)

Brewer's sparrow	<i>Spizella breweri</i>
lark sparrow	<i>Chondestes grammacus</i>
sage sparrow	<i>Amphispiza belli</i>
savannah sparrow	<i>Passerculus sandwichensis</i>
song sparrow	<i>Melospiza melodia</i>
white-crowned sparrow	<i>Zonotrichia leucophrys</i>
dark-eyed junco	<i>Junco hyemalis</i>
red-winged blackbird	<i>Agelaius phoeniceus</i>
western meadowlark	<i>Sturnella neglecta</i>
yellow-headed blackbird	<i>Xanthocephalus Xanthocephalus</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
brown-headed cowbird	<i>Molothrus ater</i>
American goldfinch	<i>Carduelis tristis</i>

Reptiles and Amphibians

Common Name	Scientific Name
spotted frog	<i>Rana pretiosa</i>
desert horned lizard	<i>Phrynosoma platyrhinos</i>
sagebrush lizard	<i>Sceloporus graciosus</i>
western fence lizard	<i>Sceloporus occidentalis</i>
common kingsnake	<i>Lampropeltis getula</i>
western rattlesnake	<i>Crotalus viridis</i>

