

MONITORING REVIEW
FOR
DEVINE CANYON UPLAND
RESTORATION PROJECT
(2008)



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Project Description

A watershed restoration project was completed in 2005 and 2006 in the Silvies River Watershed (Divine Canyon) approximately 15 miles north and east of the town of Burns, Oregon on lands owned by Clinton and Dave Purdy. (See Location Map) The project was to remove juniper from native grass stands and restore the native vegetation to a higher environmental condition nearer climax.

Grant funding was sought from the Oregon Watershed Enhancement Board (OWEB) and the cooperator contributed to the effort with in-kind services and other appropriate means. The streams and drainages affected are the head waters for the Silvies River which are on the State of Oregon 303(d) list which are not meeting temperature or biological criteria and are contributing sediment to downstream water systems.

Site Description

The project location is Township 21 South, Range 31 East, W.M. Section 14 and parts of section 13, 23, and 24 for a total of 1320 acres. Primary land use in the project area is grazing and timber production. The vegetation was characterized by a high percentage of Western Juniper interspersed with native vegetation. There were 3 photo monitoring plots established within the project area on three separate Ecological Sites. (OWEB Effectiveness Monitoring Reports)

Below is the original inventory of vegetation in the three ecological sites that the study plots are established. Attached in this document is the range inventory for current vegetation, production by weight, species composition, species comparison to climax species, site condition and erosion rates. Also the health assessment, trend, soil site stability, hydrologic function, and biotic integrity is included.

ECOLOGICAL SITE	PRESENT VEGETATION	PERCENTAGE PRESENT
Dry Pine 14 – 16	Western Juniper	55%
	Idaho Fescue	5%
	Bluebunch Wheatgrass	5%
	Antelope Bitterbrush	5%
	Mountain Big Sagebrush	10%
	Ponderosa Pine	10%
	Cheatgrass	5%

Mahogany Mountain Loam 14 – 18	Western Juniper	50%
	Curl-Leaf Mountain Mahogany	15%
	Rubber Rabbitbrush	5%
	Mountain Big Sagebrush	10%
	Antelope Bitterbrush	5%
	Idaho Fescue	5%
	Ponderosa Pine	5%
	Cheatgrass	5%
Mountain Meadow	Tufted Hairgrass	22%
	Sedge	2%
	Bluegrass	57%
	Cinquefoil	6%
	Buttercup	1%
	Groundsel	2%
	Western Yarrow	5%
	Aster	5%

As of the date of completion of the project there has been no maintenance items performed. The project still meets the goals of the original grant agreement. Last year the site appeared to be somewhat over grazed, this year utilization appears to be light or about right.

It should be also noted that there was a very big growth response by shrubby vegetation such as Antelope Bitterbrush within the project area.

Contextual Overview

1. Manipulation of Vegetation

Manipulating vegetation by artificially reintroducing the natural function of fire (mechanical juniper removal) in remnant aspen, mountain big sagebrush, bunchgrass and riparian communities is a natural part of the ecology of the ecological sites on the Purdy Ranch. These communities have lost or are losing watershed function because these ecological sites are becoming a more xeric community.

Problems to Be Addressed

Specific Problems	Root Cause(s) of the Problem
Changes in Plant Community Composition	European settlement introduced changes into the various ecosystems that contribute to the juniper expansion. Fire suppression and grazing decreased vegetative competition, encouraging growth of shrubs with safe sites for juniper seedling establishment, and providing another vector for seed dispersal. Juniper competition leads to fewer plants, less soil cover, lower water infiltration rates, more opportunity for overland flow and soil erosion, greater nutrient loss, and a less productive site.
Changes in Soil Surface Conditions	A decrease in vegetation opens soil to more exposure from wind and water influences. Erosion becomes severe with sheet, rill, and gully erosion occurring due to the lack of vegetation and litter.
Changes in Site Hydrology	Juniper uses significant amounts of water through transpiration which decreases the amount of understory vegetation produced in juniper forests. The impact is two fold in that soil moisture is lost through transpiration and then erosion increases and what water there is runs off and limits moisture infiltration.
Changes in Spring, Seep, and Stream Flow	Juniper transpiration is a major problem with rangelands that are becoming fully developed juniper forest. Juniper can use upwards of 75 percent of the soil moisture which decreases (as an example) a 12 inch precipitation area into a 3 inch precipitation area.
Changes in Wildlife Habitat	A mosaic of plant communities and seral stages with tree, shrub, and herbaceous components resulting in a more diverse landscape increasing structural, biological, and habitat diversity are lost as ecological sites become western juniper mono-cultures.
Changes in Forage Production	Under story productivity, cover, biomass, diversity, and growth rate of other vegetation declines as juniper vegetative cover increases.

Project Description

Specific Problems	Measurable Objectives	Proposed Practices, Detailed Descriptions, and Root Causes
<p>Changes in Plant Community Composition</p>	<ul style="list-style-type: none"> • *Create a mosaic of plant communities and seral stages with tree, shrub, and herbaceous components resulting in a more diverse landscape increasing structural, biological, and habitat diversity. • Reintroduce fire into the identified plant communities with 65 percent to 85 percent of the identified upland communities in actual burned (black area) to create a mosaic of seral stages. Work with the adjacent public land managers to create a similar mosaic of communities. • Reestablish bunchgrass-mountain big sagebrush communities through the reintroduction of fire where western juniper is currently in transition to a fully developed juniper woodlands. 	<ol style="list-style-type: none"> 1. Work with planners to remove juniper in an efficient cost effective manner. Mechanically remove juniper according to: <ul style="list-style-type: none"> • Appropriate plan • Agency planners agree to implementPlan • Removal plan is developed and implemented 2. Adequate rest is implemented to restore desirable plant community, vigor, and system stability. 3. Livestock water will be developed to improve distribution. 4. Management after the juniper removal is an important component of the total plan to keep desirable plants in good numbers and vigor.

Changes in Soil Surface Conditions	<ul style="list-style-type: none"> • Increased understory will also increase litter to an acceptable level. • Reduce erosion to natural levels 	
Changes in Site Hydrology	<ul style="list-style-type: none"> • *Enhance and protect the integrity of watershed function, improve watershed stability, and decrease accelerating erosion by reestablishing diverse plant communities. Increase vegetation cover, litter, and reduce the amount of exposed soil. 	
Changes in Spring, Seep, and Stream Flow	<ul style="list-style-type: none"> • Maintain or improved water quality striving toward meeting the State of Oregon water quality standards. • Enhance the aesthetic quality of Mahon and Deep Creek with the reintroduction of fire by creating a diverse landscape. 	
Changes in Wildlife Habitat	<ul style="list-style-type: none"> • Maintain and/or improved vegetation conditions beneficial to fish habitat in Mahon and Deep Creek and tributary streams with special considerations for Great Basin Redband Trout. 	

	<ul style="list-style-type: none">• Improve riparian condition and maintain or improve stream functionality by expanding hydric herbaceous and deciduous riparian woody species within communities currently encroached by western juniper.• Improve and/or maintain grassland and riparian communities to create diverse habitat for wildlife species. Create and maintain a dynamic mosaic of seral stages that will meet the forage requirements for elk, mule deer, antelope, sage grouse, neotropical birds, other mammals, amphibians, and reptiles. (It should be noted that the land owner manages these lands for livestock grazing. Good condition, and well managed rangelands and riparian areas can work together to meet requirements for both cattle and wildlife).	
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Changes in Forage Production	<ul style="list-style-type: none">• Increase amounts and quality of forage for livestock.• Improve distribution of livestock.• Increase grazing opportunities through proper management.	
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* Applies to all categories

Conclusion

Scores are rated from 1 to 5 with 1 being None to Slight and 5 being Extreme. Another way of viewing this is 1-2 is Good, 3 is fair, and 4-5 is poor.

Site #1: Soil Site Stability is a 2.2, Hydrologic Function is 2.2 and Biotic Integrity is 2.0. The range site is therefore determined to be in good condition with an upward trend.

Site #2: Soil Stability is a 1.8, Hydrologic Function is 1.9 and Biotic Integrity is 2.1. The range site is therefore in good condition with a slight upward trend.

Site #3: Soil Stability is a 2.1, Hydrologic Function is 2.1 and Biotic Integrity is 2.1. This range site is in good condition also with an upward trend.

As mentioned earlier in the text, the land owner did a good job of removing the Western Juniper and rangelands are improving with an upward trend.

It should be noted that I am not picking up new seedlings from the seeding that was done.

**OWEB Effectiveness Monitoring Report – Fence,
Water Development, Grazing Management**

OWEB Grant #: 204428

General Information:

Grantee: OWEB

Reviewer: F. Neilson

Date of Initial Evaluation: 2004

Date of Review: 8/1/2008

Treatment Site Characterization:

Location: N43°45'06.3" W118°57'17.3"

Ecoregion: (Northern Basin) High Lava Plains

Ave. Annual Ppt: 9-12" Elevation: 5,428ft Aspect: None

Landscape Position: Upland

Dominant Soil: Depth 2-4" Texture: Surface: Loam Subsurface: Rock

Plant Association: ARTRW/FEID/AGSP/POSE

Soil Limitations for Management: Shallow.

Treatment Description:

Objective: Improve watershed health by removing Western Juniper to improved range condition and health. The results would be less erosion, better water quality and quantity, improved infiltration, overland flow, and sediment yield.

Date(s) of Treatment: Spring/Summer 2006

Acres Treated: 1,320

Time Spent: 2 Months

Method of Treatment: Installation of Practice

Cost of Initial Treatment: \$100,000

Treatment Evaluation:

Method of Evaluation: Rangeland Inventory Worksheet (NRCS) Measured

Describe Method(s) used: Inventory of Trend, Health Assessment, Similarity Index, Growth Curve, Cover Estimates, and Stocking Rates

Permanent Plot Established: Y Photo Plot Established: Y

Results of Evaluation:

Pre-treatment conditions:

Pre-treatment canopy cover:

Trees: 50-60 Forbs:3 Stones/Gravels: 5

Shrubs: 15-20 Cryptograms: 2 Bare Ground: 8

Grasses/Grass-likes: 20 Litter: 2

Grazed? Y Rest/Deferment: Y Timing: Spring/Fall Duration: 1 Month

Evidence of Overland Flow: Y

Springs and/or seeps; indicator species in the area of influence of the stand:

Long Term measurement of flow: None If yes, what were the flows?

Post-treatment conditions:

Current canopy cover:

Trees: 2

Forbs: 3

Stones/Gravels: 0

Shrubs: 30

Cryptograms: 2

Bare Ground: 8

Grasses/Grass-likes: 50

Litter: 2

Grazed? Y Rest/Deferment: Y Timing: Spring or Fall

Duration: Depending on production

Evidence of Overland Flow: Slight Springs and/or seeps; indicator species in the area of
influence of the stand: Long Term measurement of flow: No If yes, what
were the flows?

SITE #1



2005 NORTH



2008 NORTH



2005 SOUTH



2008 SOUTH



2005 WEST



2008 WEST

**OWEB Effectiveness Monitoring Report – Fence,
Water Development, Grazing Management**

OWEB Grant #: 204428

General Information:

Grantee: OWEB

Reviewer: F. Neilson

Date of Initial Evaluation: 2004

Date of Review: 8/1/2008

Treatment Site Characterization:

Location: N43°45'06.3" W118°57'17.3"

Ecoregion: (Northern Basin) High Lava Plains

Ave. Annual Ppt: 9-12" Elevation: 5,428ft Aspect: None

Landscape Position: Upland Meadow

Dominant Soil: Depth 2-4" Texture: Surface: Loam Subsurface: Rock

Plant Association: DECA5/CAREX/JUNCU

Soil Limitations for Management: None

Treatment Description:

Objective: Improve watershed health by removing Western Juniper to improved range condition and health. The results would be less erosion, better water quality and quantity, improved infiltration, overland flow, and sediment yield.

Date(s) of Treatment: Spring/Summer 2006 Acres Treated: 1,320

Time Spent: 2 Months

Method of Treatment: Installation of Practice

Cost of Initial Treatment: \$100,000

Treatment Evaluation:

Method of Evaluation: Rangeland Inventory Worksheet (NRCS) Measured

Describe Method(s) used: Inventory of Trend, Health Assessment, Similarity Index, Growth Curve, Cover Estimates, and Stocking Rates

Permanent Plot Established: Y Photo Plot Established: Y

Results of Evaluation:

Pre-treatment conditions:

Pre-treatment canopy cover:

Trees: 25-30 Forbs: 3 Stones/Gravels: 0

Shrubs: 5-7 Cryptograms: 2 Bare Ground: 4

Grasses/Grass-likes: 75 Litter: 2

Grazed? Y Rest/Deferment: Y Timing: Spring/Fall Duration: 1 Month

Evidence of Overland Flow: Y

Springs and/or seeps; indicator species in the area of influence of the stand:

Long Term measurement of flow: None If yes, what were the flows?

Post-treatment conditions:

Current canopy cover:

Trees: 0

Forbs: 3

Stones/Gravels: 0

Shrubs: 5-7

Cryptograms: 2

Bare Ground: 8

Grasses/Grass-likes: 89

Litter: 2

Grazed? Y Rest/Deferment: Y Timing: Spring or Fall

Duration: Depending on production

Evidence of Overland Flow: Slight Springs and/or seeps; indicator species in the area of
influence of the stand: Long Term measurement of flow: No If yes, what
were the flows?

SITE #2



2005 West



2008 WEST



2005 EAST



2008 EAST

**OWEB Effectiveness Monitoring Report – Fence,
Water Development, Grazing Management**

OWEB Grant #: 204428

General Information:

Grantee: OWEB

Reviewer: F. Neilson

Date of Initial Evaluation: 2004

Date of Review: 8/1/2008

Treatment Site Characterization:

Location: N43°45'06.3" W118°57'17.3"

Ecoregion: (Northern Basin) High Lava Plains

Ave. Annual Ppt: 9-12" Elevation: 5,428ft Aspect: None

Landscape Position: Upland

Dominant Soil: Depth 2-4" Texture: Surface: Loam Subsurface: Rock

Plant Association: ARTRW/AGSP/STTH2

Soil Limitations for Management: Shallow.

Treatment Description:

Objective: Improve watershed health by removing Western Juniper to improved range condition and health. The results would be less erosion, better water quality and quantity, improved infiltration, overland flow, and sediment yield.

Date(s) of Treatment: Spring/Summer 2006

Acres Treated: 1,320

Time Spent: 2 Months

Method of Treatment: Installation of Practice

Cost of Initial Treatment: \$100,000

Treatment Evaluation:

Method of Evaluation: Rangeland Inventory Worksheet (NRCS) Measured

Describe Method(s) used: Inventory of Trend, Health Assessment, Similarity Index, Growth Curve, Cover Estimates, and Stocking Rates

Permanent Plot Established: Y Photo Plot Established: Y

Results of Evaluation:

Pre-treatment conditions:

Pre-treatment canopy cover:

Trees: 35-40 Forbs: 8 Stones/Gravels: 5

Shrubs: 15-20 Cryptograms: 2 Bare Ground: 8

Grasses/Grass-likes: 35 Litter: 2

Grazed? Y Rest/Deferment: Y Timing: Spring/Fall Duration: 1 Month

Evidence of Overland Flow: Y

Springs and/or seeps; indicator species in the area of influence of the stand:

Long Term measurement of flow: None If yes, what were the flows?

Post-treatment conditions:

Current canopy cover:

Trees: 2

Forbs: 3

Stones/Gravels: 0

Shrubs: 30

Cryptograms: 2

Bare Ground: 8

Grasses/Grass-likes: 50

Litter: 2

Grazed? Y Rest/Deferment: Y Timing: Spring or Fall

Duration: Depending on production

Evidence of Overland Flow: Slight Springs and/or seeps; indicator species in the area of influence of the stand: Long Term measurement of flow: No If yes, what were the flows?

SITE #3



2005 EAST



2008 EAST



NORTH 2005



NORTH 2008