

Oregon Watershed Enhancement Board

**Western Juniper Management
Effectiveness Monitoring
Phase II Final Report**

CSR Natural Resources Consulting, Inc.

November 15, 2007

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**OWEB Juniper Treatment
Effectiveness Monitoring
Phase II Final Report**

This report is submitted to the Oregon Watershed Enhancement Board (OWEB) as a summary of findings made during the summer of 2007 on twelve OWEB-funded western juniper treatment projects in Grant, Harney, Lake and Klamath counties, Oregon. The purpose of this effort is to determine the effectiveness of the OWEB Juniper Treatment Program. The sites reviewed are in private ownership. Since most treatments had been applied from 2001 through 2004, there had been at least two years of response time before being monitored. This study was funded under OWEB Contract No. 204-934-5732, as amended and was conducted by CSR Natural Resources Consulting, Inc. of Vancouver, Washington.

The report summarizes the observations and measurements made at each project location and are presented in a format similar to that contained in the individual project monitoring summaries. A set of recommendations intended to support the effectiveness, technical quality, and the success of future OWEB-funded projects and the sound investment of public funds are included.

Submitted in satisfaction of OWEB Contract No. 204-934-5732, as amended,

Richard H. Barrett, Jr., President
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Introduction

In the late 1990's the Oregon Watershed Enhancement Board (OWEB) began funding grants to promote watershed restoration in the uplands of central and eastern Oregon. Among the projects OWEB began to fund was the control of western juniper, a species native to Oregon in post-glacial times. Miller, in his recently published compendium on western juniper: *The Biology, Ecology and Management of Western Juniper*, states that western juniper woodlands occupy about 2.2 million acres in Oregon and is increasing in extent at about 3 percent per year, its greatest rate of expansion in the past 130 years - the period of European settlement and occupation (Miller, et al., 2005). He further states that this expansion is the result of a number of factors working in combination: a period of wet, mild climatic conditions in the late 1800's and early 1900's coinciding with the post-settlement period; the introduction of, and season-long grazing by, large numbers of domestic livestock beginning in the late 1800's that reduced fine fuels and reduced the frequency and effect of naturally occurring fires, exacerbated by increasingly sophisticated fire suppression, and the increase in industrial carbon dioxide as identified by significant increases in annual sapwood growth since the 1950's when compared with earlier periods. Additionally, the cessation of aboriginal burning is considered to have had significant influence in the expansion of western juniper (Dr. Lee Eddleman, OSU Rangeland Ecologist, personal communication, 2003). Eddleman also suggested that the primary mechanisms of seed dispersal supporting the expansion are birds that ingest the seed and disperse it through the environment and the downslope transport of seed by overland flow and concentrated flow in ephemeral gullies and washes – all common in juniper dominated sites.

An interest in controlling juniper has been held by rangeland managers and landowners for many decades. Initially, the control of juniper was a way to improve forage production for grazing livestock by reclaiming lands encroached upon and dominated by juniper. But in recent years, with the growing appreciation of ecosystem function and the understanding of the importance of the hydrologic function as a major driver in functioning systems, the negative effects of juniper expansion in Oregon and the West is better appreciated.

Juniper, once established in the rangeland plant communities of the intermountain West, is a shrewd competitor for moisture, for space, sunlight and nutrients. Its affects are not only negative to native plant community integrity and the hydrologic function of arid and semi-arid watersheds, but also detrimental to valuable wildlife habitat, and the economic capacities of private lands.

Juniper belongs in the landscape but, being intolerant of fire, is most suited to places in the landscape with naturally low fire frequencies or that do not produce ground fuels capable of carrying fire or producing flame lengths that lift fire into the tree canopy. These locations are readily identified as shallow or unproductive soils, rock outcrops, and rim rock.

Juniper control should not aim at juniper eradication but to back juniper out of the deep, productive soils it has encroached upon in order to maintain or repair basic ecological functions and processes.

Methodology

Projects to be monitored were selected from a list of about 35 projects provided by OWEB staff. Most of the treatments involved felling juniper with chainsaws without any further treatment or with limited scattering of juniper slash; three projects were accomplished with larger equipment) and six projects included felling with chainsaws and burning of individual trees. From these groups, twelve projects were selected that would provide the opportunity to observe the effects these treatment categories. The sites selected for review are located in Grant, Harney, Lake and Klamath counties.

Sites were located on the ground with the assistance of the landowners.

During a site visit, the treated and adjacent un-treated comparison areas (where they existed) were walked and general observations made. Typifying areas within both the treated and un-treated sites were chosen for more detailed analysis. Soil pits were dug in each representative area to determine soil depth, surface and sub-surface soil texture and identify other distinguishing soil characteristics or limitations, if any. Adjacent, un-treated sites were considered for sampling only when their soil, steepness of slope and slope orientation and tree density were the same as those on the treatment area. Eight projects, in which the whole landform was treated, lacked these un-treated comparison areas.

Vegetation sampling was done using the pace transect method described by Herrick (Herrick, et al., 2005). Photographs of the transect areas in both the treated and un-treated areas were taken and included an identifying marker containing the project number and date of the visit.

A rangeland health assessment was conducted for both the treated site and un-treated comparison area where possible. The assessment was based on the method described in *Interpreting Indicators of Rangeland Health* (Pellant, et al., 2000) which resulted in determinations of ecosystem function relating to soil stability, hydrologic function and biological integrity for each site.

Individual project reports containing the data and information recorded at the site, along with a summary discussion of observed and measured effects, landowner comments and resource management implications were then drafted.

Summary of Effects

The following summarizes the general changes observed in the four county area with significant exceptions noted. For more specific details regarding project effects at the various project sites, please refer to the individual project reports:

Changes in Plant Community Composition

Where adequate deep-rooted perennial grasses, native forbs and shrubs were present on site before treatment, they responded with increased density and/or productivity. But on sites with sparse native plant density, annual grasses and forbs occupied the sites.

Eleven projects included tree removal only and relied on the existing understory vegetation for site reoccupation. Seven of these projects (204-162, 201-249, 22-02-004, 22-02-013, 205-193 and 20-02-14) had sufficient amounts of native grasses, forbs and shrubs in the juniper understory to support their full reoccupation of the site, or (21-04-002), to initiate recovery. However, four projects (No. 25-02-012 [Phases I and II], 21-04-001 and 20-08-018) had sparse stands of native perennial plants in the pre-treatment understory. In these cases, the treatment exposed the site to occupation by annual grasses and forbs with only sparsely scattered remnants of desirable native grasses, forbs and shrubs on the site.

Project 21-02-010 was seeded to a pasture forage mix and irrigated following treatment.

Changes to Soil Surface Conditions

With two exceptions, (Projects 20-08-018 and 21-04-001), soil surface protection is adequate, or is progressing in that direction; to detain overland flow, promote infiltration and to trap sediment if overland flow occurs. Bare soils in Project 21-04-001 are subject to overland flow and soil erosion. Project 20-08-018 has weak representation of deep-rooted perennial grasses and displays evidence of overland flow and soil erosion. Project 22-02-013, would benefit from brief grazing rest and a change from spring grazing to deferred grazing (grazing after seed-ripe) to fully meet project soil stability and hydrologic objectives.

Projects 25-02-012 Phase I and 25-02-012 Phase II are fully occupied by annual grasses and forbs, which, while currently providing soil surface protection and promoting infiltration, are at risk due to the ephemeral nature of these species.

Changes to Site Hydrology

All grant applications addressed the restoration of hydrologic function as a project objective. In one half of projects, native plant responses following juniper treatment

provide effective soil surface protection against raindrop impact. In addition, accumulating plant litter is detaining overland flow, promoting infiltration and aiding in soil moisture retention by shading and insulating the soil surface

With six exceptions (Projects 21-04-001, 20-08-018, 25-02-012, Phase I, 25-02-012 Phase II, 21-04-002 and 22-02-013), all indicators: plant productivity, plant density, plant litter accumulation, biological crusts, minimal amounts of bare ground and the lack of evidence of overland flow, sheet, rill and gully erosion at all project locations indicate the recovery of infiltration rates expected in functioning systems. The exceptions: Project 21-04-001 has high amounts of bare soil, Project 20-08-018 lacks adequate deep-rooted perennial grasses, Projects 25-02-012 Phases I and II have been re-occupied by annual grasses and forbs that lack long-term dependability in soil surface protection and hydrologic function. Project 22-02-013 needs grazing rest and a change in season of grazing use to promote deep-rooted perennial grass vigor and litter accumulation

Changes in Spring, Seep, and Stream Flow

Three projects (22-02-013, 25-02-012 Phase II and 22-02-004) had the stated objective of restoring spring flows. While increases in flows, or a shift from intermittent to perennial flow were reported, no flow measurements were made.

Changes in Wildlife Habitat

Pre-treatment conditions at all locations provided thermal and escape cover to deer and elk and habitat for several species of tree dwelling birds, however this form of cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state. The treatments have restored critical habitat elements including forage, water, important edge-effect and a mosaic of habitats for a broad complex of mammalian, avian and amphibian species. Un-treated areas adjacent to the projects continue to retain their limited habitat values and provide habitat connectivity throughout the landscape.

Changes in Forage Production

In most cases, juniper treatment either increased forage production or prevented its eventual decline. Where forage increases were observed, the increases ranged from 50 to 100 percent of pre-treatment levels. Project 21-02-010 saw an increase of from 2,000 to 5,000 pounds per acre as a result of seeding and irrigation. Exceptions include projects where forage species were absent or sparse at the time of treatment (Projects 21-04-001 and 20-08-018) and there was not a positive response in plant density or production, or (Projects 25-02-012 Phases I and II, and 21-04-002), where un-dependable annual forages currently dominate the sites.

Results of Rangeland Health Assessment

Rangeland health was assessed at each site in both the un-treated comparison area, where available, and in the treatment area. The assessment method uses a qualitative approach in determining the degree of function for three essential elements: soil stability, hydrologic function and biotic integrity (Pellant. 2000). Ratings descriptors used in this assessment are: Functioning, Functioning-at-risk and Non-functioning. A “Functioning” rating implies that the indicators for a specific element being assessed are at, or very near, the ecological potential expected for the site. A rating of “Functioning-at-risk” means that evidence inferred from the observation of indicators suggests that the site departs to a moderate degree from its potential. Within this rating is the recognition of trend toward or away from site potential which is identified where possible. Finally, a “Non-functioning” rating means extreme or severe departure from the site’s ecological potential.

Soil Stability

With two exception (25-02-12 Phase I and 21-04-001), soil stability in all pre-treatment or comparison areas rated as Non-functioning or Functioning-at-risk as understory mortality, increases in bare soil and evidence of soil movement were observed. Project 25-02-012 Phase I occurs on a flat slope with little potential for water or wind erosion and Project 21-04-001 occurs where a ponderosa pine-dominated overstory and a dense understory of shrubs maintained soil stability. In the latter case, soil stability was rated as Non-functioning resulting from the removal of juniper and the understory shrubs, leaving bare soil in the tree interspaces. In all cases, but one, treatment sites were restored to Functioning or Functioning-at-risk with upward trend condition. In this exception (Project 20-08-018) post-treatment condition remains rated at Non-functioning as evidenced by active flow paths and soil movement.

Hydrologic Function

With one exception in pre-treatment conditions, hydrologic function was rated as Non-functioning or Functioning-at-risk with downward trend either because of diminished infiltration rates (bare soil), interception of precipitation by juniper canopies or excessive soil water loss through evapo-transpiration by juniper prior to treatment. Following treatment, all but two sites (Projects 21-04-001 and 20-08-018) were determined to be Functioning or Functioning-at-risk with an upward trend. Project 21-04-001 continues is rated as Functioning-at-risk with a downward trend because of the lack of soil surface cover and potential for overland flow. Project 20-08-018 remains rated as Non-functioning because of current evidence of overland flow.

Biotic Integrity

With one exception (Project 21-04-001) which is considered to be in Functioning condition, all pre-treatment conditions were rated as Non-functioning or Functioning-at-risk because of the absence, or diminishing levels of, plant diversity and productivity. Following treatment, seven projects resulted in improved conditions - Functioning or Functioning-at-risk with upward trend. The exceptions (21-04-001, 25-02-012, Phases I and II, 20-08-018 and 21-04-002) are cases in which condition remained unchanged or deteriorated. In project 21-04-001, conditions dropped from Functioning to Non-functioning with the conversion from a diverse community to one of poor diversity. In projects 25-02-012, Phases I and II, and 20-08-018, no changes in plant diversity were observed. Project 21-04-002, which appeared to improve the vigor and productivity of the remnant deep-rooted perennial grasses, there is a strong component of annual grasses. Since the direction of change is uncertain, the site was rated as Function-at-risk with no apparent trend.

Conclusion

When thoughtfully planned and applied, and supported by the appropriate follow-up management, juniper treatment provides many environmental and economic values to landowners and to the State of Oregon. The willingness of private landowners to participate in the OWEB grant programs presents OWEB, and other local, state and federal agencies, NGOs and the landowner(s) with an enormous opportunity to maintain, where they exist, and repair, where they are degraded, the basic ecological functions and processes of the Oregon landscape. It is, after all, the quality of those functions and processes that govern environmental quality and sustainable use of these lands and their associated resources.

Several of the projects visited in both the 2005 and 2007 phases of monitoring were highly effective in meeting their objectives. However, there were a number of projects which, for a couple of principal reasons, fell short of their objectives, creating different problems. The recommendations that follow address those reasons.

Recommendations

The site visits to these twelve projects illustrated the variability in levels of knowledge and skills among those who plan and apply treatments in the western juniper zones of Oregon. While several of these projects were successful in maintaining or repairing the basic ecological functions and processes of their respective landscapes, there are many which could have been more appropriately prioritized, planned and applied.

Among the projects reviewed, there were those whose design (including site selection), implementation and follow-up were flawless. On the other hand, there were projects where a pre-treatment inventory, and the application of the information derived there

from, would have helped insure a more positive response from the treatment. The following recommendations address this:

Recommendation 1

Conduct regional Juniper Management Workshops for OWEB Field Staff and Watershed Council and Soil and Water Conservation District staffs. The workshops will provide field staffs with the tools to assist landowners in conducting pre-treatment inventories, in prioritizing and planning projects and designing follow-up management. Based on OWEB's recently published "Western Juniper Management: A Field Guide", the field workshops focus on pre-treatment inventory including basic soil concepts, the identification of active erosion and erosion hazard, plant identification, determining the effects of juniper encroachment, along with identifying the need for treatment, anticipating the benefits of treatment, selecting appropriate treatment methods, and developing treatment alternatives including post-treatment management.

Recommendation 2

Support pre-application technical assistance to Watershed Councils and Soil and Water Conservation Districts and landowners in project design to help ensure the development of effective, high quality project applications and projects.

Recommendation 3

Promote, and cooperate in, landscape-scale rangeland watershed treatments that include the repair and maintenance of the upland, riparian and aquatic components, derived from sound pre-treatment inventories, and applied using site-appropriate techniques and methods that correspond to the ecological needs of individual sites and landforms, and are supported by sound follow-up management systems.

Recommendation 4

Continue to promote and support research in the maintenance and repair of watershed uplands in the juniper dominated rangelands of Oregon.

Literature cited:

Herrick, J.E., J.W. Van Zee, K.M. Havstad, L.M. Burkett, W.G. Whitford. 2005. Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems. USDA-ARS Jornada Experimental Range. Las Cruces, NM.

Miller, R.F., J.D. Bates, T.J. Svejcar, F.B. Pierson, L.E. Eddleman. 2005. Biology, Ecology and Management of Western Juniper. Technical Bulletin 152. Oregon State University, Agricultural Experiment Station. Corvallis, OR

Pellant, M., D.A. Pyke, P. Shaver, J.E. Herrick. 2000. Interpreting Indicators of Rangeland Health. Technical Reference 1734-6. U. S. Dept. of the Interior. Denver, CO.

USDA Soil Conservation Service. 1990. Ecological Site Descriptions for Oregon, Portland, Oregon.

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 25-02-012 (Phase I)

PART I

General Information:

Grantee: Box T Ranch

Address: 54229 Hwy 26 Mt. Vernon, OR 97865 Phone: (541) 932-4772

Reviewer: Hugh Barrett Date of review: August 21, 2007

Treatment Site Characterization:

Location: Lat. 44° 22' 20" N, Long. 119° 11' 09" W

Ecoregion: (Omernik, et.al) 11b John Day/Clarno Uplands

Ave. Annual Ppt.: 12 – 14" Elevation: 3930' Aspect: North Slope: Flat

Landscape Position: Mountain terrace

Dominant Soil: Depth >20" Texture: Surface Silt loam, Sub-surface Stony silt loam

Plant Association: big sagebrush/Stipa spp.

Soil Limitations for Management: None

Treatment Description:

Objective: (from grant application) Provide opportunity for increases native vegetation and rangeland health.

Date(s) of treatment: 2003 Acres treated: 48 acres Time spent: approx. 100 hours

Method of treatment: Chainsaw, handsaw, loppers, tractor grubbing

Slash disposal: (broadcast, piled, etc.) Trees dropped and left in place.

Cost of initial treatment (\$/ac): \$80.00/ac

Post-treatment Burn? (Y/N) N

Seeded? (Y/N) N

Treatment Evaluation:

Method of evaluation: (check applicable) Measured X Estimated ___

Describe method(s) used: Line-point intercept (pace transect)

Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions: Not available

Grazed? (Y/N) Y Rest/Deferment? (Y/N) N Timing: Summer

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Perennial, ephemeral or intermittent streams in the area of influence of the stand? (Y/N) N

Post-treatment conditions:

Foliar cover: 76%

Basal cover: 4%

Slash/downed trees: 6%

Live trees: 9%

Grasses/grass-likes: 76%

Shrubs: 3%

Forbs: 9%

Cryptogams: 6%

Litter: 82%

Bare ground: 0

Stones/gravels: 0

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Perennial, ephemeral or intermittent streams in the area of influence of the stand? (Y/N) N

Grazed? (Y/N) Y, Grazing mgt. plan in place? (Y/N) Y Rest/Deferment? (Y/N) N,

Timing: Summer

Conclusions:

Was the target species effectively controlled? (Y/N) Y

Were the objectives of the project achieved? (Y/N) N (if no, explain below)

An apparent lack of deep-rooted perennial grasses in the treatment area resulted in the dominance of the site by cheatgrass, ventenata and Kentucky bluegrass.

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEBGrant #: 25-02-012 (Phase I)

General Information:

Project: Box T Ranch

County: Grant

Note: In this project, the whole landform was treated. No un-treated reference areas of similar soil, slope, aspect and tree density, that would have provided an indication of pre-treatment conditions, were available. The following discussions of change in site parameters are based on the opinions of the observer.

Treatment Effects

Changes in Plant Community Composition: Based on photographs of pre-treatment conditions, evidence of shrub die-off and limited amounts of deep-rooted perennial grasses, it is thought that juniper encroachment on the treatment site was at Phase III of juniper woodland succession (Miller, et al. 2005). The current plant community is dominated by annual grasses: cheatgrass, ventenata and six-week fescue.

Changes to Soil Surface Conditions: Prior to treatment, juniper encroachment and successional development had reached the point where the loss of native understory vegetation allowed full occupation of the site by annual grasses. Consequently, litter accumulation (82 percent cover) provides soil surface protection from raindrop impact, and contributes to soil surface organic matter.

Changes to Site Hydrology: Flat terrain and litter accumulation at the soil surface ensure the infiltration of most moisture received on the site. Juniper removal is expected to have significantly reduced the evapo-transpiration of stored soil moisture.

Changes in Spring, Seep, and Stream Flow: Not observed

Changes in Wildlife Habitat: Pre-treatment conditions offered thermal cover and hiding cover to elk and deer and habitat for several species of tree dwelling birds, however this form of cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state. The current annual grass dominated plant community may offer limited value for ground nesting birds and forage for seed-eating birds.

Changes in Forage Production: Because of the dominance of annual grasses, whose production varies with annual growing conditions, herbage production is unpredictable.

Results of Rangeland Health Assessment:

Pre-treatment: Soil stability: Functioning

Hydrologic Function: Functioning-at-risk

Biotic Integrity: Non-functioning

Post-treatment: Soil stability: Functioning

Hydrologic Function: Functioning

Biotic Integrity: Non-functioning

Photo of Post-treatment Conditions:



August 21, 2007

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 25-02-012 (Phase II)

PART I

General Information:

Grantee: Box T Ranch

Address: 54229 Hwy 26 Mt. Vernon, OR 97865 Phone: (541) 932-4772

Reviewer: Hugh Barrett Date of review: August 21, 2007

Treatment Site Characterization:

Location: Lat. 44° 22' 44.8" N, Long. 119° 11' 17.2" W

Ecoregion: (Omernik, et.al) 11b John Day/Clarno Uplands

Ave. Annual Ppt.: 12 – 14" Elevation: 3600' Aspect: North Slope: 5-15%

Landscape Position: Mountain side-slope

Dominant Soil: Depth >20" Texture: Surface Silty clay loam, Sub-surface Silty clay loam

Plant Association: Douglas fir/serviceberry

Soil Limitations for Management: Moderately steep

Treatment Description:

Objective: (from grant application) Enhance water flows and provide opportunity for increases native vegetation and rangeland health.

Date(s) of treatment: 2003 Acres treated: 46 acres Time spent: approx. 100 hours

Method of treatment: Chainsaw, handsaw, loppers, tractor grubbing

Slash disposal: (broadcast, piled, etc.) Trees dropped and left in place.

Cost of initial treatment (\$/ac): \$80.00/ac

Post-treatment Burn? (Y/N) N

Seeded? (Y/N) N

Treatment Evaluation:

Method of evaluation: (check applicable) Measured Estimated

Describe method(s) used: Line-point intercept (pace transect)

Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions: Not available

Grazed? (Y/N) Y Rest/Deferment? (Y/N) N Timing: Summer

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) Y

Long-term measurement of flow? (Y/N) N

Perennial, ephemeral or intermittent streams in the area of influence of the stand? (Y/N) Y

Long-term measurement of flow? (Y/N) N

Post-treatment conditions:

Foliar cover: 64% Basal cover: 0
Slash/downed trees: 8% Live trees: 5% Grasses/grass-likes: 60%
Shrubs: 10% Forbs: 9% Cryptogams: 16%
Litter: 76% Bare ground: 0 Stones/gravels: 12%
Evidence of overland flow? (Y/N) N
Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) Y
Long-term measurement of flow? (Y/N) N
Perennial, ephemeral or intermittent streams in the area of influence of the stand? (Y/N) Y
Long-term measurement of flow? (Y/N) N

Grazed? (Y/N) Y, Grazing mgt. plan in place? (Y/N) Y Rest/Deferment? (Y/N) N,
Timing: Summer

Conclusions:

Was the target species effectively controlled? (Y/N) Y
Were the objectives of the project achieved? (Y/N) N (if no, explain below)

An apparent lack of deep-rooted perennial grasses in the treatment area resulted in the dominance of the site by cheatgrass, ventenata and Kentucky bluegrass.

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEBGrant #: 25-02-012 (Phase II)

General Information:

Project: Box T Ranch

County: Grant

Note: In this project, the whole landform was treated. No un-treated reference areas of similar soil, slope, aspect and tree density, that would have provided an indication of pre-treatment conditions, were available. The following discussions of change in site parameters are based on the opinions of the observer.

Treatment Effects

Changes in Plant Community Composition: Based on photographs of pre-treatment conditions, evidence of shrub die-off and limited amounts of deep-rooted perennial grasses, it is thought that juniper encroachment on the treatment site was at Phase III of juniper woodland succession (Miller, et al. 2005). The current understory plant community is dominated by annual grasses: cheatgrass, ventenata and six-week fescue.

Changes to Soil Surface Conditions: Prior to treatment, juniper encroachment and successional development had reached the point where the loss of native understory vegetation allowed full occupation of the site by annual grasses. Consequently, litter accumulation (76 percent cover) provides soil surface protection from raindrop impact, and contributes to soil surface organic matter.

Changes to Site Hydrology: Litter accumulation at the soil surface appears to detain overland flow and promote the infiltration of most moisture received on the site. Juniper removal is expected to have reduced the evapo-transpiration of stored soil moisture.

Changes in Spring, Seep, and Stream Flow: The landowner stated that flow from the spring immediately below the treatment area has increased from intermittent to perennial since the time of treatment. No measurements of flow quantities have been recorded.

Changes in Wildlife Habitat: Pre-treatment conditions offered thermal cover and hiding cover to elk and deer and habitat for several species of tree dwelling birds, however this form of cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state. The current annual grass dominated plant community may offer limited value for ground nesting birds and forage for seed-eating birds.

Changes in Forage Production: Because of the dominance of annual grasses, whose production varies with annual growing conditions, herbage production is unpredictable.

Results of Rangeland Health Assessment:

Pre-treatment: Soil stability: Functioning
Hydrologic Function: Non-functioning
Biotic Integrity: Non-functioning

Post-treatment: Soil stability: Functioning
Hydrologic Function: Functioning-at-risk
Biotic Integrity: Non-functioning

Photo of Post-treatment Conditions:



August 21, 2007

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 21-02-010

General Information:

Grantee: Bonanza Juniper Removal

Address: 3311 Haskins Rd., Bonanza, OR 97623 Phone: (541) 545-6232

Reviewer: Hugh Barrett

Date of review: August 27, 2007

Treatment Site Characterization:

Location: 42° 12' 42" N 121° 24' 57.3" W

Ecoregion: 9j Klamath Juniper Woodland

Ave. Annual Ppt.: 12-14" Elevation: 4325' Aspect: W Slope: 5-10%

Landscape Position: Mountain side-slope

Dominant Soil: Lorella series, Depth: >20" Texture: Surface: stony fine sandy loam

Sub-surface: stony fine sandy loam

Plant Association: big sagebrush/Thurber needlegrass/bluebunch wheatgrass

Soil Limitations for Management: Stony soils

Treatment Description:

Objective: (from grant application) Increase water availability

Date of treatment: Spring 2003 Acres treated: 20 ac. Time spent: 120 hrs.

Method of treatment: Chainsaw

Slash disposal: (broadcast, piled, etc.) Tree boles were removed, slash piled and burned.

Cost of initial treatment (\$/ac): \$275.00/ac

Post-treatment Burn? (Y/N) Y

Seeded? (Y/N) Y

Treatment Evaluation:

Method of evaluation: (check applicable) Measured X Estimated

Describe method(s) used: Line-intercept, pace transect

Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions:

Foliar cover: 68%

Basal cover: 0

Trees: 14%

Forbs: 24%

Stones/gravels: 64%

Shrubs: Trace

Cryptogams: 0

Bare ground: 0

Grasses/grass-likes: 62% Litter: 32%

Density of deep-rooted perennial grasses: <2/10 sq ft

Grazed? (Y/N) N Rest/Deferment? (Y/N) N/A

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Ephemeral, intermittent or perennial streams in the area of influence of the stand?(Y/N)N

Post-treatment conditions:

Foliar cover: 95%

Seeded to an irrigated pasture mix. Species identified include:

Tall fescue

Crested wheatgrass

Kentucky bluegrass

Intermediate wheatgrass

Yellow sweetclover

New Zealand white Dutch clover

Density of deep-rooted perennial grasses: > 2/10 sq. ft.

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Ephemeral or intermittent streams in the area of influence of the stand? (Y/N) N

Grazed? (Y/N) Y Grazing mgt. plan in place? (Y/N) Y Rest/Deferment? (Y/N) N/A

Timing: Summer/Fall Duration: Season long

Describe grazing system: N/A

Conclusions:

Was the target species effectively controlled? (Y/N) Y

Were the objectives of the project achieved? (Y/N) Y* (if no, explain below)

* According to the land owner, the treatment area is within the coverage of their center-pivot sprinkler system and was seeded to an irrigated pasture mix. The recovery of native rangeland vegetation was precluded by the seeding and irrigation.

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEBGrant #: 21-02-010

General Information:

Project: Bonanza Juniper Removal

County: Klamath

Treatment Effects

Changes in Plant Community Composition: The untreated comparison area is at Phase III of juniper woodland succession (Miller, et al. 2005). Sagebrush expected on the site, was absent as were most of the deep-rooted perennial grasses. The understory plant community is dominated by annual grasses (medusahead and cheatgrass) and an annual forb (willowweed). Biscuitroot, a perennial native forb, is the only common remnant of the native plant community. The treatment, including tree removal, pasture planting and irrigation resulted in a complete stand conversion. Seeded species include Kentucky bluegrass, crested wheatgrass, tall fescue, intermediate wheatgrass, New Zealand Dutch clover and yellow sweetclover.

Changes to Soil Surface Conditions: Accumulated plant litter and stones comprised about 95 percent of the soil surface cover on the untreated comparison area. No bare soil was observed. In the treatment area, foliar cover was observed to be about 97 percent, with 3 percent or less bare soil.

Changes to Site Hydrology: There was evidence of active flow paths and overland flow in the untreated area. In the treatment area, there was evidence of past gullying, presumably from concentrated flows from the upslope sites. These shallow gullies (one foot deep or less) were fully vegetated and stable. No evidence of overland flow was observed in the treatment area. It is presumed that the removal of juniper has reduced the evapo-transpiration of soil water.

Changes in Spring, Seep, and Stream Flow: Not observed.

Changes in Wildlife Habitat: Pre-treatment conditions offered limited thermal cover and hiding cover to deer and habitat for several species of tree dwelling birds, however this form of cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state. Conversion of the site to irrigated pasture has greatly increased forage availability for deer and geese.

Changes in Forage Production: The plant community in the untreated area produced only low quality and unpalatable forage for livestock and is not considered suited for

livestock grazing. Plant composition and productivity in the treatment area is estimated to produce from 2,000 to 5,000 pounds of forage per acre or from 2 to 4 animal unit months (AUMs) per acre.

Results of Rangeland Health Assessment:

Pre-treatment: Soil stability: Functioning-at-risk
Hydrologic Function: Non-functioning
Biotic Integrity: Non-functioning

Post-treatment: Soil stability: Functioning
Hydrologic Function: Functioning
Biotic Integrity: Functioning

Photo of Pre- and Post-treatment Conditions:

Photo at left is of the untreated comparison area immediately upslope of the treatment area. Photo at right is of the treatment area, seeded to a pasture mix and irrigated. August 27, 2007.



OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 22-02-013

PART I

General Information:

Grantee: Curry Springs Juniper Control Project

Address: 30552 Hotchkiss Lane, Burns, OR 97720 Phone: (541) 573-7577

Reviewer: Hugh Barrett Date of review: August 24, 2007

Treatment Site Characterization:

Location: Lat. 43° 38' 24" N, Long. 119° 39' 32.8" W

Ecoregion: (Omernik, et.al) 80g High Lava Plains

Ave. Annual Ppt.: 10 – 12" Elevation: 4550' Aspect: ESE

Landscape Position: Toe-slope

Dominant Soil: Depth >20" Texture: Surface Silt loam, Sub-surface Silty clay loam

Plant Association: big sagebrush/bluebunch wheatgrass/Thurber needlegrass

Soil Limitations for Management: Steep slope, surface stones and boulders

Treatment Description:

Objective: (from grant application) “Protect watershed integrity, improve watershed stability and decrease accelerating sediment erosion.”

Date(s) of treatment: 2003 Acres treated: 80 acres Time spent: approx. 100 hours

Method of treatment: Chainsaw

Slash disposal: (broadcast, piled, etc.) Boles removed for fence posts, approx. 80% of the slash was piled and burned, with the remaining 20% piled for wildlife or broadcast to “enhance ... vegetative re-growth”

Cost of initial treatment (\$/ac): (from final report) \$

Post-treatment Burn? (Y/N) Y Date: Winter 2004, Method: Piles burned

Seeded? (Y/N) N

Costs (\$/ac.): \$125.00

Treatment Evaluation:

Method of evaluation: (check applicable) Measured X Estimated ___

Describe method(s) used: Line-point intercept (pace transect)

Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions:

Foliar cover: 40 %

Trees: 8%

Forbs: 7%

Stones/gravels 44%

Shrubs: 14% (dead)

Cryptogams: 0

Bare ground: 12%

Grasses/grass-likes: 71%

Litter: 20%

Grazed? (Y/N) Y Rest/Deferment? (Y/N) N Timing: April through May Duration: 45 days

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Perennial, ephemeral or intermittent streams in the area of influence of the stand? (Y/N) Y

Long-term measurement of flow? (Y/N) N

Post-treatment conditions:

Foliar cover: 54%

Slash/downed trees: 2%

Grasses/grass-likes: 84%

Cryptogams: 0

Trees: 0

Forbs: 2%

Stones/gravels: 26%

Shrubs: 16%

Litter: 54%

Bare ground: 2%

Evidence of overland flow? (Y/N) ___

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Perennial, ephemeral or intermittent streams in the area of influence of the stand? (Y/N) Y

Long-term measurement of flow? (Y/N) N

Grazed? (Y/N) Y, Grazing mgt. plan in place? (Y/N) Y* Rest/Deferment? (Y/N) N,

Timing: April through May, Duration 45 days

Describe grazing system: Currently annual spring use, discussed switching to deferred use (late summer or fall use after seed-ripe).

Conclusions:

Was the target species effectively controlled? (Y/N) Y

Were the objectives of the project achieved? (Y/N) Y* (if no, explain below)

*While the control of juniper in the treatment area is expected to have increased the availability of soil water and nutrients for grasses, shrubs and forbs; annual spring grazing is retarding, or preventing, the attainment of the treatment objectives.

To optimize the effects of the treatment, livestock grazing in the treatment area should be rested for one to two years and a grazing system designed to include late summer or fall (deferred grazing) in two out of every three years until recovery is achieved.

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEBGrant #: 22-02-013

General Information:

Project: Curry Springs Juniper Management Project

County: Harney

Treatment Effects

Changes in Plant Community Composition: Tree height and density and shrub die-off in the untreated reference area are typical of Phase II juniper woodland succession. All shrubs encountered in the transect of the untreated area were dead, while in the treated area, sagebrush was dead but all green rabbitbrush and horsebrush were alive. While the grass cover component was similar on both sites, cheatgrass appeared to be more common on the treated site. Juniper litter made up about 2 percent of the treated site, compared with the 7 percent cover of live trees on the untreated site. Forbs were not well represented on either site due to the timing (late summer) of the evaluation.

Changes to Soil Surface Conditions: Juniper encroachment and successional development in the untreated area has reached the point where the loss of understory vegetation is reducing plant cover, resulting in excessive amounts of bare soil, increasing the risk of overland flow and soil erosion. Current spring (April through May) grazing use of the treated area is disturbing the soil surface and maintaining levels of bare soil similar to those in the untreated area. Annual grazing in the treatment area appears to be preventing the accumulation of plant litter. Plant litter in the untreated area was measured at 54 percent, while in the treated area; plant litter was measured at 20 percent.

Changes to Site Hydrology: The treatment is expected to have significantly reduced both fall, winter and spring interception of rain and snow and evapo-transpiration loss of soil water by juniper throughout the year. Grazing rest or the deferment of grazing use until after seed-ripe (discussed with the grantee) are expected to promote full recovery of hydrologic function in the treatment area.

Changes in Spring, Seep, and Stream Flow: Not determined.

Changes in Wildlife Habitat: Pre-treatment conditions offered limited thermal cover and hiding cover to deer and habitat for several species of tree dwelling birds, however this form of cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state. The treatment is expected to promote the recovery of big sagebrush that has been lost to die-off in the untreated area

Changes in Forage Production: Current herbage production in the untreated area is estimated to be 600 to 800 pounds per acre, or 3 to 4 acres per animal unit month (AUM) at the level of proper grazing use. Similar production levels were observed in the treatment area. With proposed changes in the season of grazing use, herbage production can be expected to 700 to 900 pounds per acre, or 2 to 3 acres per animal unit month (AUM).

Results of Rangeland Health Assessment:

Pre-treatment: Soil stability: Functioning-at-risk
Hydrologic Function: Functioning-at-risk.
Biotic Integrity: Functioning-at-risk

Post-treatment: Soil stability: Functioning-at-risk (Current grazing)
Hydrologic Function: Functioning-at-risk (Current grazing)
Biotic Integrity: Functioning-at-risk (Current grazing)

Photos of Pre- and Post-treatment Conditions:

The photo on the left shows an untreated reference area, note shrub die-off. The photo on the right shows the grazed treated area with the untreated reference site in the distance. August 24, 2007.



OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 205-193

General Information:

Grantee: Upper Chewaucan Watershed Enhancement Project (Gaylord)
Address: 22952 Clover Flat Rd., Paisley, OR 97636 Phone: (541) 219-0427
Reviewer: Hugh Barrett Date of review: August 29, 2007

Treatment Site Characterization:

Location: 42° 28' 06.5" N 120° 36' 25.7' W
Ecoregion: 9h Fremont Pine/Fir Forest
Ave. Annual Ppt.: 12 – 14" Elevation: 5360' Aspect: West Slope: 10 -15%
Landscape Position: Mountain toe-slope
Dominant Soil: Depth 20 – 40" Texture: Surface: fine sandy clay loam
Sub-surface: clay
NRCS Ecological Site: Claypan 12 -14" P.Z.
Soil Limitations for Management: Moderately steep slopes, argillic (clay) horizon

Treatment Description:

Objective: (from grant application)
Date(s) of treatment: Acres treated: 131 ac. Time spent: est. 120 hrs
Method of treatment: Chainsaw
Slash disposal: (broadcast, piled, etc.) Downed trees left in place.
Cost of initial treatment (\$/ac): est. \$50.00/ac.
Post-treatment Burn? (Y/N) N
Seeded? (Y/N) N

Treatment Evaluation:

Method of evaluation: (check applicable) Measured X Estimated
Describe method(s) used: Line-intercept, pace transect
Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions: Not available
Grazed? (Y/N) N Rest/Deferment? (Y/N) Y
Evidence of overland flow? (Y/N) N
Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N
Ephemeral, intermittent or perennial streams in the area of influence of the stand?(Y/N)Y
Long-term measurement of flow? (Y/N) N

OWEB Grant #: 205-193

Post-treatment conditions:

Foliar cover: 64%

Basal cover: 16%

Slash/downed trees: 4%

Grasses/grass-likes: 24%

Cryptogams: 0

Trees: 1%

Forbs: 24%

Stones/gravels: 2%

Shrubs: 29%

Litter: 16%

Bare ground: 16%

Density of deep-rooted perennial grasses: > 2/10 sq. ft.

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Grazed? (Y/N) N Grazing mgt. plan in place? (Y/N) Y Rest/Deferment? (Y/N) Y

Describe grazing system: The treatment area has been rested since the time of treatment.

Conclusions:

Was the target species effectively controlled? (Y/N) Y

Were the objectives of the project achieved? (Y/N) Y

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEBGrant #: 205-193

General Information:

Project: Upper Chewaucan Watershed Enhancement Project (Gaylord)

County: Lake

Note: In this project, the whole landform was treated. No un-treated reference areas of similar soil, slope, aspect and tree density, that would have provided an indication of pre-treatment conditions, were available. The following discussions of change in site parameters are based on the opinions of the observer.

Treatment Effects

Changes in Plant Community Composition: Measurements of juniper duff (leaf litter) cover in the treatment area indicate a pre-treatment juniper canopy of about 10 percent and the trees ranged from 15 to 20 feet in height. When considered in combination, juniper canopy cover and height indicate juniper woodland succession at Phase II (Miller, 2005). At this stage of succession on the moderately deep soils in the treatment area, shrubs would become stressed, their growth slowed and some shrub die-off would be expected and was observed. New leader growth of 8 to 10 inches on antelope bitterbrush in the treated area was considered exceptionally good. Grasses and forbs occurred in the proportions and amounts expected for the site.

Changes to Soil Surface Conditions: Juniper encroachment and successional development had not reached the point where the loss of understory vegetation resulted in excessive amounts of bare soil. While bare soil was somewhat common on the site, it was within the range expected on a west-facing slope. Plant litter has been accumulating on the soil surface since the time of treatment.

Changes to Site Hydrology: The treatment was applied early enough in the stage of juniper encroachment to prevent overland flow and soil loss.

Changes in Spring, Seep, and Stream Flow: Not determined

Changes in Wildlife Habitat: Pre-treatment conditions offered limited thermal cover and hiding cover to deer and habitat for several species of tree dwelling birds, however this form of cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state. The treatment has prevented the loss of browse species including antelope bitterbrush and has restored edge-effect and a mosaic of habitats for a complex of mammalian and avian species.

Changes in Forage Production: Current herbage production is estimated to be 700 to 900 pounds per acre, or 2 to 3 acres per animal unit month (AUM) at the level of proper grazing use. Several years of grazing rest appear to have promoted improved plant vigor and production. Juniper treatment prevented the eventual reduction or loss understory shrubs, grasses and forbs.

Results of Rangeland Health Assessment:

Pre-treatment: Soil stability: Functioning-at-risk
Hydrologic Function: Functioning-at-risk.
Biotic Integrity: Functioning-at-risk

Post-treatment: Soil stability: Functioning
Hydrologic Function: Functioning
Biotic Integrity: Functioning

Photo of Post-treatment Conditions:



August 29, 2007

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 22-02-014

PART I

General Information:

Grantee: Fort Rock Silver Lake SWCD

Address: 17612 Hwy 395, Lakeview, OR 97630 Phone: (541) 947-5855

Reviewer: Hugh Barrett Date of review: August 24, 2007

Treatment Site Characterization:

Location: Lat. 43° 22' 46" N, Long. 120° 46' 22.4" W

Ecoregion: (Omernik, et.al) 80d Pluvial Lake Basins

Ave. Annual Ppt.: 8-10" Elevation: 4514' Aspect: Flat

Landscape Position: Valley bottom

Dominant Soil: Depth >20" Texture: Surface loamy sand, Sub-surface loamy sand

Plant Association: big sagebrush/Idaho fescue/dryland sedge

Soil Limitations for Management: Wind erosion hazard

Treatment Description:

Objective: (from grant application) Restore forage production and reduce excessive evapo-transpiration by juniper

Date(s) of treatment: 2003 Acres treated: 80 acres Time spent: approx. 100 hours

Method of treatment: Chainsaw and dozer

Slash disposal: (broadcast, piled, etc.)

Cost of initial treatment (\$/ac): \$180.00/ac.

Post-treatment Burn? (Y/N) Y Date: Winter 2004, Method: Piles burned

Seeded? (Y/N) N

Treatment Evaluation:

Method of evaluation: (check applicable) Measured X Estimated ___

Describe method(s) used: Line-point intercept (pace transect)

Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions:

Pre-treatment foliar cover: 56% Basal cover: 12%

Trees: 9% Forbs: 6% Stones/gravels 0

Shrubs: 35% Cryptogams: 0 Bare ground: 24%

Grasses/grass-likes: 50% Litter: 50%

Grazed? (Y/N) Y Rest/Deferment? (Y/N) N Timing: April through May, Duration: 45 days

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Ephemeral, intermittent or perennial streams in the area of influence of the stand?(Y/N)N

Post-treatment conditions:

Post-treatment foliar cover: 54%

Basal cover: 16%

Slash/downed trees: 2%

Grasses/grass-likes: 84%

Cryptogams: 0

Trees: 0

Forbs: 2%

Stones/gravels: 26%

Shrubs: 16%

Litter: 54%

Bare ground: 2%

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N*

*Livestock well at edge of treatment area.

Grazed? (Y/N) Y, Grazing mgt. plan in place? (Y/N) Y Rest/Deferment? (Y/N) Y,

Timing: Late summer and fall, Duration 45 days

Describe grazing system: Grazed after seed ripe (Deferred grazing).

Conclusions:

Was the target species effectively controlled? (Y/N) Y

Were the objectives of the project achieved? (Y/N) Y

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEBGrant #: 20-02-14

General Information:

Project: Morrison Juniper Removal Project

County: Lake

Treatment Effects

Changes in Plant Community Composition: Juniper density and apparent tree age in the untreated comparison area indicate a Phase I of woodland succession (Miller, et al. 2005), while shrub mortality, reduced grass density and the amount of bare soil are at levels expected in late Phase II or early Phase III. It is suspected that a dense layer of lake deposited volcanic ash restricts the deep percolation of soil moisture and limits plant root penetration to the upper soil profile. As a result, strong competition for moisture may be occurring in the upper soil profile. Transects and observation indicate a clear difference in grass density, vigor and production between the treated and untreated sites. Rabbitbrush has increased while sagebrush has decreased.

Changes to Soil Surface Conditions: Juniper encroachment had reached the point where the loss of understory vegetation resulted in excessive amounts of bare soil. Grass density and cover (reconstructed after grazing) indicate a significant increase in soil surface protection from wind erosion.

Changes to Site Hydrology: This site is not subject to overland flow or erosion by water. The principal effect of the treatment has been to reduce excessive evapotranspiration of soil water by juniper.

Changes in Spring, Seep, and Stream Flow: Not observed.

Changes in Wildlife Habitat: Pre-treatment conditions offered thermal cover and hiding cover to deer and habitat for several species of tree dwelling birds, however this form of cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state.

Changes in Forage Production: Pre-treatment herbage yields is estimated to range from 300-600 pounds per acre, or 4 to 8 acres per animal unit month (AUM) Current herbage production is estimated to be 700 to 900 pounds per acre, or 2 to 3 acres per AUM at the level of proper grazing use. Deferred grazing appears to have promoted improved plant vigor and density.

Results of Rangeland Health Assessment:

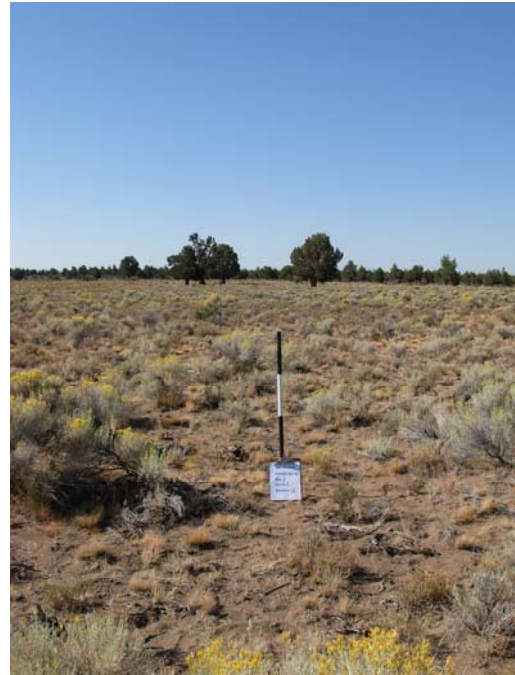
Pre-treatment: Soil stability: Functioning-at-risk
Hydrologic Function: Functioning-at-risk.
Biotic Integrity: Functioning-at-risk

Post-treatment: Soil stability: Functioning
Hydrologic Function: Functioning
Biotic Integrity: Functioning-at-risk

Photos of Pre- and Post-treatment Conditions:

The photo at left represents the untreated comparison area. The photo at right is of the treated area.

August 30, 2007



OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 21-04-002

General Information:

Grantee: Mroczkowski Juniper Removal

Address: 11451 Harpold Rd., Klamath Falls, OR 97603 Phone: (541) 545-6632

Reviewer: Hugh Barrett

Date of review: August 26, 2007

Treatment Site Characterization:

Location: 42° 07' 01.6" N 121° 26' 42.7" W

Ecoregion: 9j Klamath Juniper Woodland

Ave. Annual Ppt.: 10-12" Elevation: 4350' Aspect: W Slope: 5-10%

Landscape Position: Mountain side-slope

Dominant Soil: Lorella series, Depth: <20" Texture: Surface: Stony loam

Sub-surface: Stony clay loam

Plant Association: low sage/Thurber needlegrass/bluebunch wheatgrass

Soil Limitations for Management: Shallow, stony soils

Treatment Description:

Objective: (from grant application) "Reduce fire hazard, conserve water and reduce erosion, encourage return of native vegetation and improve wildlife habitat"

Date of treatment: Winter 2004 Acres treated: 70 ac. Time spent: 120 hrs.

Method of treatment: Chainsaw

Slash disposal: (broadcast, piled, etc.) Trees were piled and burned.

Cost of initial treatment (\$/ac): \$80.00/ac

Post-treatment Burn? (Y/N) Y

Seeded? (Y/N) N

Treatment Evaluation:

Method of evaluation: (check applicable) Measured X Estimated

Describe method(s) used: Line-intercept, pace transect

Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions: (if available) Not available

Grazed? (Y/N) N Rest/Deferment? (Y/N) N/A

Evidence of overland flow? (Y/N)

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Ephemeral, intermittent or perennial streams in the area of influence of the stand? (Y/N) N

Post-treatment conditions:

Foliar cover: 60%

Basal cover: 2%

Slash/downed trees: 0

Grasses/grass-likes: 68%

Cryptogams: 0%

Trees: 2%

Forbs: 30%

Stones/gravels: 46%

Shrubs: 3%

Litter: 42%

Bare ground: 8%

Density of deep-rooted perennial grasses: < 2/10 sq. ft.

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Long-term measurement of flow? (Y/N) N If yes, what were the flows? gpm

Ephemeral or intermittent streams in the area of influence of the stand? (Y/N) Y

Long-term measurement of flow? (Y/N) N If yes, what were the flows? Unknown cfs

Grazed? (Y/N) N Grazing mgt. plan in place? (Y/N) N/A Rest/Deferment? (Y/N) N/A

Timing: N/A Duration: N/A

Describe grazing system: N/A

Conclusions:

Was the target species effectively controlled? (Y/N) Y

Were the objectives of the project achieved? (Y/N) Y* (if no, explain below)

*It appears that the density of deep-rooted perennial grasses was less than 2 plants per 10 square feet at the time of treatment. annual grasses and forbs took advantage of any release of soil water and nutrients resulting from the treatment and are retarding the re-occupation of the site by native vegetation. The stony soil surface precludes drilling of seed. Broadcasting native seed prior to treatment may have accelerated the recovery of native vegetation.

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEBGrant #: 21-04-002

General Information:

Project: Mroczkowski Juniper Removal

County: Klamath

Note: In this project, the whole landform was treated. No un-treated reference areas of similar soil, slope, aspect and tree density, that would have provided an indication of pre-treatment conditions, were available. The following discussions of change in site parameters are based on the opinions of the observer.

Treatment Effects

Changes in Plant Community Composition: Based on photographs of pre-treatment conditions, evidence of shrub die-off and limited amounts of deep-rooted perennial grasses, it is thought that juniper encroachment on the treatment site was at Phase III of juniper woodland succession (Miller, et al. 2005). Of the grass component of the current plant community, approximately 30 percent is made up of deep-rooted perennial grasses including, in order of occurrence: squirreltail, Thurber needlegrass, and bluebunch wheatgrass. Annual grasses (cheatgrass, Japanese brome, and medusahead) comprise the remaining 70 percent of the grass cover.

Changes to Soil Surface Conditions: Prior to treatment, juniper encroachment and successional development had reached the point to where there was a significant reduction of native understory vegetation and, according to the project application; there was a significant amount of bare soil beneath the trees. Tree removal allowed to occupation of the bare areas by annual grasses. Consequently, annual plant litter accumulation (about 40 percent cover) provides soil surface protection from raindrop impact, and contributes to soil surface organic matter.

Changes to Site Hydrology: Litter accumulation at the soil surface promotes the infiltration of most moisture received on the site. Juniper removal is expected to have significantly reduced the evapo-transpiration of stored soil moisture. Some active flow paths were observed in the treatment area. The retention of slash in these flow paths would have detained overland flow and trapped sediment

Changes in Spring, Seep, and Stream Flow: Not observed

Changes in Wildlife Habitat: Pre-treatment conditions offered thermal cover and hiding cover to deer and habitat for several species of tree dwelling birds, however this form of

cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state. The current grass cover (annual and perennial) may offer cover for ground nesting birds and forage for seed-eating birds.

Changes in Forage Production: Pre-treatment herbage yields is estimated to range from 200-400 pounds per acre, or 5 to 12 acres per animal unit month (AUM) Potential herbage production is estimated to be 700 to 900 pounds per acre, or 2 to 3 acres per AUM at the level of proper grazing use. The site is not grazed by livestock.

Results of Rangeland Health Assessment:

Pre-treatment: Soil stability: Functioning-at-risk
Hydrologic Function: Non-functioning
Biotic Integrity: Non-functioning

Post-treatment: Soil stability: Functioning
Hydrologic Function: Functioning
Biotic Integrity: Functioning-at-risk

Photo of Post-treatment Conditions:



August 26, 2007

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 21-04-001

PART I

General Information:

Grantee: Peacore Juniper Removal Project

Address: P.O. Box 10779 Keno, OR 97865 Phone: (541) 882-5083

Reviewer: Hugh Barrett Date of review: August 27, 2007

Treatment Site Characterization:

Location: Lat. 42° 06' 04" N, Long. 121° 55' 31.2" W

Ecoregion: (Omernik, et.al) 9i Southern Cascade Slope

Ave. Annual Ppt.: 12 – 14" Elevation: 4280' Aspect: East Slope: 15-25%

Landscape Position: Mountain side-slope

Dominant Soil: Depth >20" Texture: Surface: fine sandy loam, Sub-surface: fine sandy loam

Plant Association: ponderosa pine/birchleaf mountain mahogany/manzanita

Soil Limitations for Management: Steep slopes

Treatment Description:

Objective: (from grant application) Reduce competition for moisture and soil nutrients to restore native grasses and shrubs.

Date(s) of treatment: 2004 Acres treated: 20 acres Time spent: approx. 150 hours

Method of treatment: Chainsaw, brush-beater

Slash disposal: (broadcast, piled, etc.) Trees piled and burned

Cost of initial treatment (\$/ac): \$80.00/ac

Post-treatment Burn? (Y/N) N

Seeded? (Y/N) Y

Treatment Evaluation:

Method of evaluation: (check applicable) Measured X Estimated ___

Describe method(s) used: Line-point intercept (pace transect)

Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions

Foliar cover: 92% Basal cover: 0

Trees: 37% Forbs: 0 Stones/gravels: 12%

Shrubs: 63% Cryptogams: 0 Bare ground: 0

Grasses/grass-likes: 0 Litter: 84%

Grazed? (Y/N) Y Rest/Deferment? (Y/N) N Timing: Summer

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Perennial, ephemeral or intermittent streams in the area of influence of the stand? (Y/N) N

Post-treatment conditions:

Post-treatment foliar cover: 60%

Slash/downed trees: 0

Shrubs: 26%

Litter: 64%

Live trees: 58%

Forbs: 16%

Bare ground: 16%

Basal cover: 0

Grasses/grass-likes: 0

Cryptogams: 0

Stones/gravels: 0

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Perennial, ephemeral or intermittent streams in the area of influence of the stand? (Y/N) N

Grazed? (Y/N) Y, Grazing mgt. plan in place? (Y/N) Y Rest/Deferment? (Y/N) N,

Timing: Summer

Conclusions:

Was the target species effectively controlled? (Y/N) Y

Were the objectives of the project achieved? (Y/N) N (if no, explain below)

Juniper was partially removed (45 percent of the remaining tree canopy was juniper) and pine and fir were retained on site. Lower understory shrubs were removed and tall deciduous shrubs/trees (wild plum and birchleaf mountain mahogany) were retained. There was no evidence of seeded grasses on the upper two-thirds of the treatment area.

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEBGrant #: 21-04-001

General Information:

Project: Peacore Juniper Removal Project

County: Klamath

Treatment Effects

Changes in Plant Community Composition: The plant community in the untreated comparison area was dominated by ponderosa pine in the overstory with shrubs (serviceberry, manzanita, snowberry, antelope bitterbrush and currant) occupying the mid- and lower levels of the understory. Western juniper was a minor component (2-4 percent) of the overstory in the stand. In the treatment area Douglas fir seedlings and saplings were common. Chokecherry was responding aggressively to the treatment. Few grasses (*Stipa* spp.) were encountered during the evaluation.

Changes to Soil Surface Conditions: The treatment resulted in an increase in bare ground: 0 in the untreated area, 16% in the treatment area.

Changes to Site Hydrology: In spite of the bare ground exposed by the treatment, there was no evidence of overland flow or soil erosion.

Changes in Spring, Seep, and Stream Flow: Not observed.

Changes in Wildlife Habitat: Pre-treatment conditions offered dense thermal cover and hiding cover to deer and other mammals and habitat for several species of tree dwelling birds. The treatment removed all but the overstory tree cover while providing some food sources (chokecherry, serviceberry and wild plum) for birds, deer and bear.

Changes in Forage Production: No livestock forage was produced in the pre-treatment condition. Potential forage production in the treatment area could range from 500 to 1,000 pounds per acre or 1.5 to 3.0 acres per animal unit month (AUM), depending on tree canopy cover. However almost no forage species were observed in the upper half of the treatment area.

Results of Rangeland Health Assessment:

Pre-treatment: Soil stability: Functioning
Hydrologic Function: Functioning
Biotic Integrity: Functioning

Post-treatment: Soil stability: Functioning-at-risk
Hydrologic Function: Functioning-at-risk
Biotic Integrity: Functioning-at-risk

Photos of Pre- and Post-treatment Conditions:

The photo at the left is representative of the area before treatment. The photo at right is of the treatment area. August 27, 2007



OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 22-02-004

General Information:

Grantee: Silver Creek Spring Development & Rangeland Restoration Phase #1
Address: 644 Valley View Dr., Burns ,OR 97720 Phone: (541) 573-2272
Reviewer: Hugh Barrett Date of review: August 23, 2007

Treatment Site Characterization:

Location: 43° 44' 52.7" N 119° 18' 24" W
Ecoregion: 11i Continental Zone Foothills
Ave. Annual Ppt.: 12 – 14" Elevation: 4580' Aspect: West Slope: 15-20%
Landscape Position: Mountain side-slope
Dominant Soil: Depth <20" Texture: Surface: fine sandy loam
Sub-surface: silty clay loam
Plant Association: big sagebrush/Idaho fescue/bluebunch wheatgrass
Soil Limitations for Management: Stony, steep slopes

Treatment Description:

Objective: (from grant application) "...restoration of native grass and forb communities for wildlife and grazing..."
Date(s) of treatment: Fall 2002 Acres treated: 145 ac. Time spent: 145 hrs.
Method of treatment: Chainsaw
Slash disposal: (broadcast, piled, etc.) Boles removed, slash scattered
Cost of initial treatment (\$/ac): \$60.00/ac. (from final report)
Post-treatment Burn? (Y/N) N
Seeded? (Y/N) N

Treatment Evaluation:

Method of evaluation: (check applicable) Measured X Estimated
Describe method(s) used: Line-intercept, pace transect
Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions: Not available
Density of deep-rooted perennial grasses: ≥ 2/10 sq. ft.
Grazed? (Y/N) N Rest/Deferment? (Y/N) Y
Evidence of overland flow? (Y/N) N
Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N
Long-term measurement of flow? (Y/N) N/A If yes, what were the flows? N/A
Ephemeral or intermittent streams in the area of influence of the stand? (Y/N) N
Long-term measurement of flow? (Y/N) N/A If yes, what were the flows? N/A

Post-treatment conditions:

Foliar cover: 66%

Basal cover: 18%

Slash/downed trees: 4%

Grasses/grass-likes: 63%

Cryptogams: 0

Trees: 0

Forbs: 4%

Stones/gravels: 32%

Shrubs: 32%

Litter: 36%

Bare ground: 4%

Density of deep-rooted perennial grasses: > 2/10 sq. ft.

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Ephemeral, intermittent or perennial streams in the area of influence of the stand?(Y/N)Y

Long-term measurement of flow? (Y/N) N

Grazed? (Y/N) Y Grazing mgt. plan in place? (Y/N) N Rest/Deferment? (Y/N) N

Timing: Summer Duration: 3 months

Describe grazing system: There was no evidence of rest or deferment of grazing use after the treatment. Monitoring records indicate annual "hot season" grazing (June through August) with uncontrolled livestock access to springs and stream and riparian area.

Conclusions:

Was the target species effectively controlled? (Y/N) Y

Were the objectives of the project achieved? (Y/N) Y (if no, explain below)

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEBGrant #: 22-02-004

General Information:

Project: Silver Creek Spring Development & Rangeland Restoration Phase #1

County: Harney

Note: In this project, the whole landform was treated. No un-treated reference areas of similar soil, slope, aspect and tree density, that would have provided an indication of pre-treatment conditions, were available on the grantee's property. The following discussions of change in site parameters are based on the opinions of the observer.

Treatment Effects

Changes in Plant Community Composition: Aerial photos and the existing juniper stand on the adjoining ownership indicate that the treated area was in Phase I and II of juniper woodland succession (Miller, 2005). At Phase I of succession on the shallow soil in the treatment area, there would be little, if any suppression of understory shrubs, grasses or forbs. The treatment of juniper was the timely prevention of the loss of understory plant productivity and plant community diversity. Other than the removal of juniper, no significant change was expected. Phase II stands showed evidence of some shrub die-off but no change in grass and forb production. Treatment at this stage eliminated juniper induced stress and prevented further site deterioration.

Changes to Soil Surface Conditions: Juniper encroachment and successional development had not reached the point where the loss of understory vegetation resulted in excessive amounts of bare soil. Plant litter has been accumulating on the soil surface since the time of treatment.

Changes to Site Hydrology: The treatment was applied early enough in the stage of juniper encroachment to prevent overland flow and soil loss.

Changes in Spring, Seep, and Stream Flow: Not determined.

Changes in Wildlife Habitat: Pre-treatment conditions offered limited cover to elk and deer and habitat for several species of tree dwelling birds, however this form of cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state. The treatment has prevented the loss of browse species including antelope bitterbrush.

Changes in Forage Production: Current herbage production is estimated to be 700 to 900 pounds per acre, or 2 to 3 acres per animal unit month (AUM) at the level of proper grazing use. Juniper treatment prevented the eventual reduction or loss understory shrubs, grasses and forbs.

Results of Rangeland Health Assessment:

Pre-treatment: Soil stability: Functioning-at-risk.

Hydrologic Function: Functioning-at-risk.

Biotic Integrity: Functioning-at-risk.

Post-treatment: Soil stability: Functioning

Hydrologic Function: Functioning

Biotic Integrity: Functioning

Photo of Post-treatment Conditions:



August 23, 2007

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 204-162

General Information:

Grantee: Upper South Fork John Day River Watershed Restoration

Address: 721 South Canyon Blvd., John Day, OR 97845 Phone: (541) 575-0646

Reviewer: Hugh Barrett

Date of review: August 21, 2007

Treatment Site Characterization:

Location: 44° 05' 37.4" N 119° 23' 55.2' W

Ecoregion: 11d Blue Mountain Mélange

Ave. Annual Ppt.: 12 – 14" Elevation: 4425' Aspect: ESE Slope: 15-25%

Landscape Position: Mountain side-slope

Dominant Soil: Depth <20" Texture: Surface: stony sandy loam

Sub-surface: stony sandy loam

Plant Association: antelope bitterbrush/bluebunch wheatgrass

Soil Limitations for Management: Steep slopes, shallow, highly erodible soils

Treatment Description:

Objective: (from grant application) "Release sequestered water from junipers" , (as expressed by landowner) "Release perennial grasses, increase infiltration, release water and nutrients, increase available space and sunlight for native plants and improve wildlife habitat."

Date of treatment: Fall 2004 Acres treated: 130 ac. Time spent: 120 hrs.

Method of treatment: Chainsaw

Slash disposal: (broadcast, piled, etc.) Downed trees left in place.

Cost of initial treatment (\$/ac): \$80.00/ac

Post-treatment Burn? (Y/N) N

Seeded? (Y/N) N

Treatment Evaluation:

Method of evaluation: (check applicable) Measured Estimated

Describe method(s) used: Line-intercept, pace transect

Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions: Not available

Grazed? (Y/N) N Rest/Deferment? (Y/N) Y

Evidence of overland flow? (Y/N) N

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Ephemeral, intermittent or perennial streams in the area of influence of the stand?(Y/N)Y

Long-term measurement of flow? (Y/N) N

Post-treatment conditions:

Foliar cover: 54%

Basal cover: 10%

Slash/downed trees: 2%

Grasses/grass-likes: 80%

Cryptogams: 2%

Trees: 1%

Forbs: 4%

Stones/gravels: 10%

Shrubs: 16%

Litter: 56%

Bare ground: 14%

Density of deep-rooted perennial grasses: > 2/10 sq. ft.

Evidence of overland flow? (Y/N) Y

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Long-term measurement of flow? (Y/N) N

Ephemeral, intermittent or perennial streams in the area of influence of the stand?(Y/N)Y

Long-term measurement of flow? (Y/N) N

Grazed? (Y/N) N Grazing mgt. plan in place? (Y/N) Y Rest/Deferment? (Y/N) Y

Timing: N/A Duration: N/A

Describe grazing system: The treatment area has been rested since the time of treatment.

Conclusions:

Was the target species effectively controlled? (Y/N) Y

Were the objectives of the project achieved? (Y/N) Y* (if no, explain below)

* Juniper control, on the steep slopes, with shallow and highly erodible soils should include the broadcast of slash across the soil surface to detain overland flow and trap sediment and accelerate the achievement of the objective.

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 204-162

General Information:

Project: Upper South Fork John Day River Watershed Restoration

County: Grant

Note: In this project, the whole landform was treated. No un-treated reference areas of similar soil, slope, aspect and tree density, that would have provided an indication of pre-treatment conditions, were available. The following discussions of change in site parameters are based on the opinions of the observer.

Treatment Effects

Changes in Plant Community Composition: Pre-treatment tree density, tree age (80 years+) and the evidence of shrub die-off indicate that the juniper stand was in late Phase II of woodland succession (Miller, et al. 2005). The snowberry, horsebrush and rabbitbrush encountered in the transect were dead while the antelope bitterbrush appeared to have been unaffected by the juniper encroachment. The deep-rooted perennial grasses appeared healthy and vigorous

Changes to Soil Surface Conditions: Juniper encroachment and its successional development had reached the point where the loss of understory vegetation resulted in excessive amounts of bare soil. Evidence of overland flow and soil erosion was common; however, plant litter has been accumulating on the soil surface since the time of treatment. This is the kind of site where broadcasting juniper slash would have detained overland flow, trapped sediment and enhanced the re-occupation of the site by deep-rooted perennial shrubs.

Changes to Site Hydrology: The timing of the treatment prevented the further loss of understory vegetation and the subsequent reduction of infiltration and increase of soil loss. The recovery of native grasses and the accumulation of plant litter at the soil surface are expected to improve infiltration and prevent excessive soil loss over time but not, however, as quickly as broadcasting juniper slash would have accomplished.

Changes in Spring, Seep, and Stream Flow: Not determined.

Changes in Wildlife Habitat: Pre-treatment conditions offered limited thermal cover and hiding cover to deer and habitat for several species of tree dwelling birds, however this form of cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state. The treatment has prevented the loss of

browse species including antelope bitterbrush and has restored edge-effect and a mosaic of habitats for a complex of mammalian and avian species.

Changes in Forage Production: Current herbage production is estimated to be 400 to 600 pounds per acre, or 3 to 5 acres per animal unit month (AUM) at the level of proper grazing use. Several years of grazing rest appear to have promoted improved plant vigor and production. Juniper treatment prevented the eventual reduction or loss understory shrubs, grasses and forbs.

Results of Rangeland Health Assessment:

Pre-treatment: Soil stability: Non-functioning

Hydrologic Function: Non-functioning

Biotic Integrity: Functioning-at-risk (downward trend)

Post-treatment: Soil stability: Functioning-at-risk (upward trend)

Hydrologic Function: Functioning-at-risk (upward trend)

Biotic Integrity: Functioning-at-risk (upward trend)

Photo of Post-treatment Conditions:



August 21, 2007

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 201-249

PART I

General Information:

Grantee: Harney County Watershed Council

Address: HC71 4.51 Hwy. 205 Burns, Burns, OR 97720 Phone: (541) 573-2064

Reviewer: Hugh Barrett Date of review: August 23, 2007

Treatment Site Characterization:

Location: Lat. 43° 34' 36.9" N, Long. 119° 08' 38.8" W

Ecoregion: (Omernik, et.al) 11i Continental Zone Foothills

Ave. Annual Ppt.: 10 – 12" Elevation: 4980' Aspect: North Slope: 15%

Landscape Position: Mountain side-slope

Dominant Soil: Depth <40" Texture: Surface stony silt loam, Sub-surface stony silty clay loam

Plant Association: big sagebrush/Idaho fescue/bluebunch wheatgrass

Soil Limitations for Management: Steep slope, surface stones and bedrock

Treatment Description:

Objective: (from grant application) Manage for ecological balance by thinning juniper to increase native plant production.

Date(s) of treatment: Winter 2003 Acres treated: 207 acres Time spent: approx. 100 hours

Method of treatment: Chainsaw

Slash disposal: (broadcast, piled, etc.) Trees were dropped and left in place.

Cost of initial treatment (\$/ac): \$50.00/ac

Post-treatment Burn? (Y/N) N

Seeded? (Y/N) N

Treatment Evaluation:

Method of evaluation: (check applicable) Measured X Estimated ___

Describe method(s) used: Line-point intercept (pace transect)

Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions: Not available

Grazed? (Y/N) Y Rest/Deferment? (Y/N) Y Timing: Summer/Fall in rotation

Evidence of overland flow? (Y/N) Y

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Perennial, ephemeral or intermittent streams in the area of influence of the stand? (Y/N)N

Post-treatment conditions:

Foliar cover: 56%

Slash/downed trees: <u>8%</u>	Grasses/grass-likes: <u>87%</u>	Cryptogams: <u>0</u>
Trees: <u>2%</u>	Forbs: <u>2%</u>	Stones/gravels: <u>32%</u>
Shrubs: <u>7%</u>	Litter: <u>26%</u>	Bare ground: <u>6%</u>

Evidence of overland flow? (Y/N) ___

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Perennial, ephemeral or intermittent streams in the area of influence of the stand? (Y/N)N

Grazed? (Y/N) Y, Grazing mgt. plan in place? (Y/N) Y Rest/Deferment? (Y/N) Y,

Timing: Summer/Fall, Duration 45 days

Describe grazing system: Grazed in Summer and Fall in alternate years: "Rotational deferred grazing".

Conclusions:

Was the target species effectively controlled? (Y/N) Y

Were the objectives of the project achieved? (Y/N) Y

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEBGrant #: 201-249

General Information:

Project: Urizar Juniper Removal Project

County: Harney

Note: In this project, the whole landform was treated. No un-treated reference areas of similar soil, slope, aspect and tree density, that would have provided an indication of pre-treatment conditions, were available. The following discussions of change in site parameters are based on the opinions of the observer.

Treatment Effects

Changes in Plant Community Composition: Measurements of juniper duff (leaf litter) cover in the treatment area indicate a pre-treatment juniper canopy of about 20 percent. Evidence of past sheet erosion (pedestalled plants and lichen lines) and shrub mortality, in combination with pre-treatment juniper canopy cover indicate juniper woodland succession at Phase III (Miller, et al. 2005). At this stage of succession, on the moderately deep soils in the treatment area, shrub die-off would be expected and was observed. Some grass loss is expected to have occurred as well. The treatment has resulted in improved grass density, production and vigor. Shrubs are well represented in the plant community.

Changes to Soil Surface Conditions: Juniper encroachment and successional development had not reached the point where the loss of understory vegetation resulted in excessive amounts of bare soil and soil erosion. Plant density appears to be increasing and plant litter is accumulating on the soil surface since the time of treatment.

Changes to Site Hydrology: Increasing plant density and litter accumulation are decreasing the effects of raindrop impact, detaining overland flow and support improving infiltration rates. No indication of active flow channels or sheet erosion was observed during the evaluation.

Changes in Spring, Seep, and Stream Flow: Not observed

Changes in Wildlife Habitat: Pre-treatment conditions offered thermal cover and hiding cover to deer and habitat for several species of tree dwelling birds, however this form of cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state. The treatment provides the habitat elements of value to sage grouse.

Changes in Forage Production: Pre-treatment herbage yields (based on observation of adjoining ownerships) is estimated to range from 200-400 pounds per acre, or 8 to 15 acres per animal unit month (AUM) Current herbage production is estimated to be 700 to 900 pounds per acre, or 2 to 3 acres per AUM at the level of proper grazing use. Several years of grazing rest appear to have promoted improved plant vigor and production.

Results of Rangeland Health Assessment:

Pre-treatment: Soil stability: Functioning-at-risk
Hydrologic Function: Functioning-at-risk.
Biotic Integrity: Functioning-at-risk

Post-treatment: Soil stability: Functioning-at-risk (Upward trend)
Hydrologic Function: Functioning-at-risk (Upward trend)
Biotic Integrity: Functioning

Photo of Post-treatment Conditions:



August 23, 2007

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 20-08-018

General Information:

Grantee: WRI Juniper Thinning Project

Address: 42642 Hwy. 31, Paisley, OR 97636 Phone: (541) 943-5435

Reviewer: Hugh Barrett Date of review: August 28, 2007

Treatment Site Characterization:

Location: 42° 42' 12.9" N 120° 39' 59.9" W

Ecoregion: 8-j Semi-arid Uplands

Ave. Annual Ppt.: 12 -14" Elevation: 4706' Aspect: North Slope: 5-15%

Landscape Position: Mountain terrace and side-slopes

Dominant Soil: Depth >20" Texture: Surface: gravelly loam

Sub-surface: clay

Plant Association: big sagebrush/bluebunch wheatgrass

Soil Limitations for Management: Surface stones

Treatment Description:

Objective: (as expressed by landowner) "Release perennial grasses, increase infiltration, release water and nutrients, increase available space and sunlight for native plants."

Date of treatment: Winter 2005 Acres treated: 80 ac. Time spent: 120 hrs.

Method of treatment: Chainsaw

Slash disposal: (broadcast, piled, etc.) Downed trees left in place and individually burned

Cost of initial treatment (\$/ac): \$120.00/ac

Post-treatment Burn? (Y/N) Y

Seeded? (Y/N) N

Treatment Evaluation:

Method of evaluation: (check applicable) Measured X Estimated

Describe method(s) used: Line-intercept, pace transect

Permanent plot established? (Y/N) N Photo plot Established? (Y/N) N

Results of evaluation:

Pre-treatment conditions: Not available

Grazed? (Y/N) Y Rest/Deferment? (Y/N) N

Evidence of overland flow? (Y/N) Y

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Ephemeral or intermittent streams in the area of influence of the stand? (Y/N) Y

Post-treatment conditions:

Foliar cover: 28%

Basal cover: 2%

Slash/downed trees: 6%

Grasses/grass-likes: 12%

Cryptogams: 0

Trees: 0

Forbs: 44%

Stones/gravels: 6%

Shrubs: 45%

Litter: 58%

Bare ground: 30%

Density of deep-rooted perennial grasses: < 2/10 sq. ft.

Evidence of overland flow? (Y/N) Y

Springs and/or seeps; indicator species in the area of influence of the stand? (Y/N) N

Grazed? (Y/N) Y Grazing mgt. plan in place? (Y/N) Y Rest/Deferment? (Y/N) N

Timing: Summer Duration: 2 months

Describe grazing system: Grazed annually in July and August

Conclusions:

Was the target species effectively controlled? (Y/N) Y

Were the objectives of the project achieved? (Y/N) N (if no, explain below)

The lack of deep-rooted perennial grasses and the amount of bare ground in the pre-treatment condition are suggestive of the need to seed the treatment area and to broadcast juniper slash on the exposed soils within the area of treatment rather than burning the downed trees. Long-term grazing rest and/or deferred grazing (grazing after seed-ripe) may promote attainment of project objectives.

Summary

OWEB Effectiveness Monitoring Report – Juniper Treatment

OWEB Grant #: 20-08-018

General Information:

Project: WRI Juniper Control Project

County: Lake

Note: In this project, the whole landform was treated. No un-treated reference areas of similar soil, slope, aspect and tree density, that would have provided an indication of pre-treatment conditions, were available. The following discussions of change in site parameters are based on the opinions of the observer.

Treatment Effects

Changes in Plant Community Composition: Juniper leaf litter amounts indicate a pre-treatment juniper canopy cover at about 20 percent, which when considered in combination with evidence of some shrub die-off and bare soil, indicates that the juniper stand was in Phase III of woodland succession (Miller, et al. 2005). The post-treatment plant community is composed of stressed shrubs (big sagebrush and rabbitbrush), lupine and Sandberg bluegrass. The areas beneath and around burned trees can be expected to become occupied by weedy plants. Seeding, as part of the treatment, appears to have been needed.

Changes to Soil Surface Conditions: Other than the increase in bare areas exposed by burning individual trees, little change in soil surface condition seems to have occurred. Physical soil capping is common and insignificant litter accumulation is taking place.

Changes to Site Hydrology: Rill erosion, active flow paths and pedestalled plants are common. Except on flat areas and in depressions, overland flow and soil erosion are expected during periods of intense precipitation, rain-on-snow events, or periods of rapid snow melt. Broadcasting juniper slash is expected to have detained overland flow, improved infiltration and provided sediment capture.

Changes in Spring, Seep, and Stream Flow: Not observed.

Changes in Wildlife Habitat: Pre-treatment conditions offered limited thermal cover and hiding cover to deer and habitat for several species of tree dwelling birds, however this form of cover and habitat is not believed to be a limiting factor for any of these wildlife species in this region of the state.

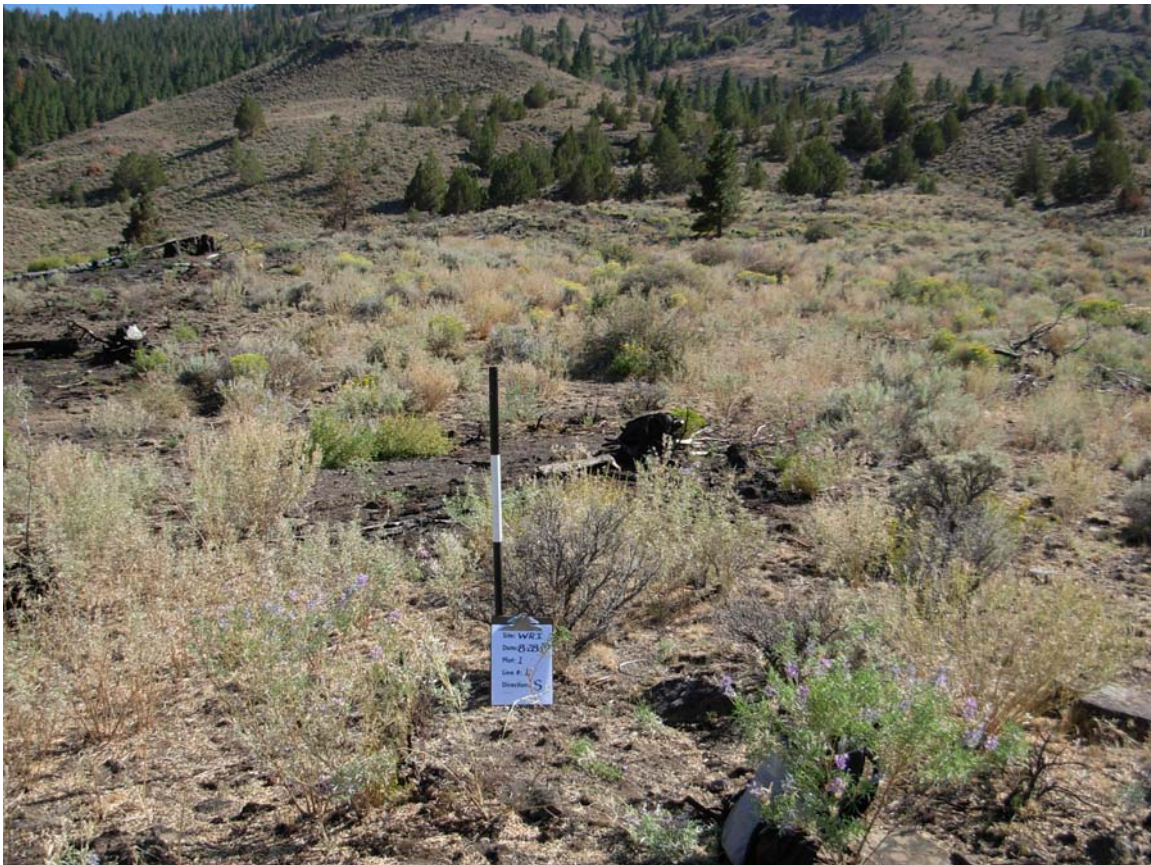
Changes in Forage Production: Current herbage production is estimated to be 400 to 600 pounds per acre, or 8 to 12 acres per animal unit month (AUM) at the level of proper grazing use.

Results of Rangeland Health Assessment:

Pre-treatment: Soil stability: Non-functioning
Hydrologic Function: Non-functioning
Biotic Integrity: Non-functioning

Post-treatment: Soil stability: Non-functioning
Hydrologic Function: Non-functioning
Biotic Integrity: Non-functioning

Photo of Post-treatment Conditions:



August 27, 2007