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Euchiniko Sidehills and Grizzly Valley
2015 Vegetation Monitoring Summary

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CONTENTS

1 INTRODUCTION

The Society for Ecological Restoration in Northern BC (SERNbc) has an ongoing prescribed burning program at its Euchiniko Sidehills and Grizzly Valley restoration sites (the Project). Ecofor Consulting Ltd (Ecofor) was retained by SERNbc to conduct vegetation monitoring as per the Prescribed Burn Monitoring Protocol for Omineca Region, British Columbia (Rooke et al 2015). This document summarizes the work conducted at the Euchiniko Sidehills and Grizzly Valley by Ecofor in 2015.

Data entry and unidentified plant identification is ongoing and will be presented as an addendum when complete.

1.1 PROJECT LOCATION

Euchiniko Sidehills is located approximately 70 km south of the town of Vanderhoof, BC. The approximate centre point of the sampling area is found at UTM coordinates (NAD 83) Zone 10U, 410548 E, 5920719 N. The site can be accessed by road by following the Kluskus Forestry Service Road (FSR) south from Vanderhoof for 69 km, then following the Gold FSR for approximately 18 km south, and finally along a very rough unnamed forestry road for approximately 5 km. Smaller forestry roads allow access by truck the westernmost sites from this point. Concrete barricades prevent truck access further along the road, but ATV or UTV access is possible.

The Euchiniko Sidehills area is comprised of a matrix of grassland, shrubs and forest of varying ages and composition on a south facing hillside. In 2003, an ecosystem classification was done for the site, which identified numerous site series variants, including some at-risk plant communities, and made recommendations for maintaining grassland area through prescribed burns in some areas (Simonar and Migabo 2003).

This site was last treated with a prescribed burn in 2014. An area of approximately 250 hectares was ignited by hand with additional ignition using aerial support. An older burned area borders the site to the east and south.

Grizzly Valley is located about 92 km south of Vanderhoof, BC at UTM coordinates Zone 10U, 398298 E, 5902616 N. The site is accessed by truck by following the Kluskus FSR South approximately 108 km then east on the Blue Road for 5 km, then south along a smaller forestry road for 5.5 km, and finally, following the block road to the south for several kilometers. From this point, further progress is restricted to ATV, UTV or on foot due to poor road conditions and several deep road gullies along the road where culverts were removed. Additional approaches are possible to access different sections of Grizzly Valley, but some degree of foot travel is required to access all sites.

The Grizzly Valley site is divided into two areas: Area 1 and Area 2. Area 1 is a mosaic of grassy hillside with various areas of shrub coverage and forest of varying age and composition. Area 2 is primarily forested hillside. Area 1 underwent prescribed burning in 2007 and 2012. Area 2 was partially burned in 2012. No follow-up assessment (e.g. burn boundary mapping) of the prescribed burn had been conducted prior to this work.

1.2 OBJECTIVES

SERNbc has specific ecosystem restoration objectives for each area:

- Euchiniko Sidehills: Stop aspen encroachment and reclaim existing grasslands.
- Grizzly Valley – Area 1: Maintain a mosaic of grass, uneven aged shrubs and aspen.
- Grizzly Valley – Area 2: Reduce tree cover, and expand open sidehill mosaic east toward Tatelkuz Mtn.

The monitoring objectives in all areas were to collect data to characterize changes in vegetation composition and stand structure (resulting from the prescribed burn).

2 METHODS

Matching methodologies were used for Euchiniko Sidehills and Grizzly Valley except where noted below. The Prescribed Burn Monitoring Protocol for Omineca Region, British Columbia was (Rooke et al 2015) used as the guideline for the assessments with any modifications noted in each section below.

2.1 PLOT SELECTION

Plots were randomly selected based on the strata provided by SERNbc. Orthoimagery was used to delineate approximate boundaries of the strata. In each of the strata, five plots were randomly located (Appendix 1). The strata were as follows:

Euchiniko Sidehills (20 plots total):

- Control Grassland
- Treated Grassland
- Control Treed
- Treated Treed

Grizzly Valley (30 plots total):

- Control Grassland (Area 1/2)
- Treated Grassland (Area 1)
- Control Treed (Area 1)
- Treated Treed (Area 1)
- Control Treed (Area 2)
- Treated Treed (Area 2)

Plot locations had to be greater than 50 m from strata boundaries and greater than 100 m from other plots to be considered valid. Due to some uncertainties associated with strata delineation, additional random plot locations were obtained to provide backup plot locations if field conditions did not

sufficiently match the strata in which original plot locations landed. If a field location was found to be unsatisfactory, the next random location was substituted.

2.2 PLOT ASSESSMENT

Assessments at each plot follow the Prescribed Burn Monitoring Protocol for Omineca Region, British Columbia (Rooke et al 2015) for site characteristics, stand structure, vegetation intercept transects, shrub transects, and ungulate use plots. Soil profiling was not conducted due to time constraints. The simplified coarse woody debris (CWD) scoring method was utilized, as described in the protocol.

Recommended field forms were utilized for stand structure (FS505G), vegetation (FS505G), and shrub transects (FS882(4)). A supplemental combined field form was developed to record data for canopy coverage, CWD, and ungulate use (Appendix 2).

Two perpendicular transects in each treed plot were assessed, while only one was assessed in grassland plots, as per the protocol. Transects were established using a random bearing from a random number table. A 50 cm pigtail stake was place at the centre of each plot, along with a 10 cm nail driven flush with the ground. A second 10 cm nail, driven flush to the ground was placed at the 25 m mark on each transect. Where available, the tree nearest the plot centre was spray painted orange at shoulder height and at ground level, and an aluminum tag with Project and Plot information was affixed with an aluminum nail. In grassland plots, trees were not generally present; a pigtail and nail were placed, but nothing was spray painted.

Photos in the four cardinal directions were taken at the centre of each plot with a digital camera. Photos of the canopy and ground vegetation were generally taken as well.

All herbaceous vascular species and low woody shrubs listed in the Field Manual for Describing Terrestrial Ecosystems (Ministry of Forests and Range and Ministry of Environment 2010) in were included in the vegetation transects. Shrub and tree species less than 2 m tall were included in the shrub transects. Unidentified plants were collected for identification at the office.

Ungulate use plots were 4.0 m radius circles centred at 10, 20, 30, 40, and 50 m on each transect. Ungulate use plot centres were marked with flagging ribbon.

3 RESULTS & DISCUSSION

While scans of the field cards were submitted to SERNbc, data entry was not part of the Project contract. Therefore, the results are limited to general observations of current site conditions. Nonetheless, these offer some value in documenting the general impacts of the prescribed burn, and provide useful logistical information for planning future monitoring and/or treatments. Appendix 3 presents representative photos from each treatment in both areas.

3.1 PRELIMINARY TREATMENT RESPONSE

Grassland areas in both sites appeared to have had some of the shrubs inhibited, where shrubs were present. This was particularly true for rose (*Rosa acicularis*). Aspen regen, at least in the areas where it

was sparse appeared scarred and less vigourous. In contrast, most thick aspen regen does not appear to have burned well, and appeared healthy.

Open mature aspen and cottonwood stands appeared to have experienced a low intensity burn. These stands still typically have a thick cover of various herbs.

Conifer stands generally experienced more intense fires. Likely owing to many trees already being dead in pine stands, there tended to be less abundant herb growth. Most alder in these areas was killed, but was resprouting.

3.2 EUCHINIKO SIDEHILLS

Sampling took place at Euchiniko Sidehills from September 1st to September 6th (Appendix 4). It became evident once on the site that the area that burnt during the 2014 prescribed burn extended outside of the original area planned. As a result, all areas delineated as control grassland was been burned and a different control grassland area was required. An area about 800 m southeast of the treated area was utilized as the new control grassland strata (Appendix 1). The new control grassland area is restricted in size, so the plots are fairly close together (but none are within 100 m from another plot). In addition, this area was previously burned (> 15 years ago); it may not be the ideal control site but it appears to be fairly similar in site characteristics and vegetation composition to the treated area, and will still offer value when monitored over time.

A variety of burn intensities were observed throughout the treated areas. Based on general observations it appeared that conifer dominant areas experienced the most intense fires, while mature aspen and cottonwood treed areas experienced ground fires only.

Representative photos for each strata are presented in Appendix 3.

3.3 GRIZZLY VALLEY

Sampling took place at Grizzly Valley from September 7th to September 19th (Appendix 4). Aside from the grassland areas, the prescribed burn was difficult to predict from the orthoimagery and aerial photos available. Many treed areas did not show clear signs of burning; likely due to the longer time since the burn (ca. 2012) and the patchy nature of the burn. Some areas showed evidence of intense burns, especially conifer stands near the top of the slope. At least one extensive area of young aspen (approx. 10 years old) showed evidence high tree mortality.

Grizzly Valley has extensive evidence of cattle grazing. There are numerous cow trails that run parallel to the slope of the site for the entire length of the grassland area of Area 1 and many extend further west into the forests of Area 2. These present the easiest method of access throughout the project area.

Several human-made cut trails are present along the base of the hill along the southern edge of the site. These do not appear to be well-travelled or maintained.

Orchard grass (*Dactylis glomerata*) was extremely common in many parts of the grassland and open forest areas. This introduced species was also found throughout the cutblocks on the east side of the site, but was completely absent from Euchiniko Sidehills. Another introduced grass, smooth brome (*Bromus*

inermis ssp. *inermis*) was common throughout Grizzly Valley. This grass was found to a lesser extent in Euchiniko Sidehills.

The entire main grassland section of Area 1 was burned during the treatment. This was visible in the aerial photos provided by SERNbc. Consequently, control grass areas were very difficult to locate. Several small areas of unburned grassland were located in the west side of Area 2; four control grassland plots were placed here. The final control grass plot was placed in a flat open area towards the south east corner of Area 1.

3.4 UNIDENTIFIED PLANTS

In some instances some species of plants could not be identified in the field. Plants generally began to die in early September, making identification of some species more difficult. However, most species remained in a condition suitable for conducting the vegetation assessment.

There were approximately 85 plant specimens collected; identification of these samples is ongoing. Upon completion, the data will be provided to SERNbc.

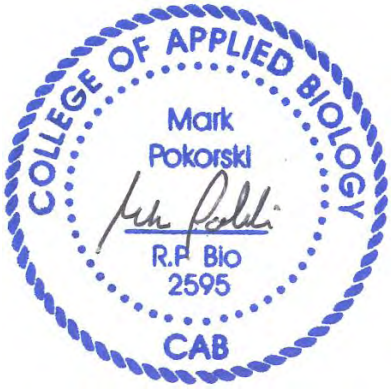
3.5 PROTOCOL FEEDBACK

The prescribed burn monitoring protocol for the Omineca Region (Rooke et al 2015) was generally straightforward to use and required a minimum of equipment. Additional detailed instruction for the vegetation and shrub transect assessment procedure would be helpful for ensuring uniformity of assessments between surveyors. The ungulate use survey requires additional description as well.

Field cards specific to the protocol, (or even lined paper) could offer a simpler and less paper-intensive approach to recording field data. Digital entry in ERPro in the field would avoid this issue and omit the need to manually enter data following field work.

4 CLOSURE

This report summarizes the findings of the field work by Mark Pokorski and Carla Davis of Ecofor Consulting Ltd. regarding the assessment of vegetation. Findings reflect the conditions in the field at the time of the assessment. Plant specimen identification is ongoing. Discussions around options for field data card entry are underway with SERNbc.



Mark Pokorski, MSc, RPBio, PBiol

5 LITERATURE CITED

British Columbia Ministry of Forests and Range and British Columbia Ministry of Environment. 2010. Field manual for describing terrestrial ecosystems. 2nd ed. Forest Science Program, Victoria, B.C. Land Management Handbook No. 25. www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh25-2.htm

Rooke, S., B. Pate, and R.S. McNay. 2015. A prescribed burn monitoring protocol for the Omineca Region, British Columbia. Wildlife Infometrics Report No. 494. Wildlife Infometrics Inc., Mackenzie, British Columbia, Canada.

Simonar, K., and S. Migabo. 2003. Grassland classification, rare and endangered ecosystem and plant survey and ecosystem terrain mapping of Euchiniko Sidehills proposed sensitive area. Bio-Geo Dynamics Ltd., Prince George, BC.

6 APPENDICES

6.1 APPENDIX 1 – MAPPING

Prescribed Burn Vegetation Monitoring Plots

Grizzly Valley

1:25,000

0 150 300 600 900 1,200 1,500m

NAD 1983 UTM Zone 10N
BCGS 20k Mapsheet: 93F.028
NTS 50k Mapsheet: 93F/07

GV24 GV23 GV25 GV02 GV03 GV04 GV05 GV30 GV22 GV15 GV10 GV08 GV13 GV11 GV17 Area 1 GV14 GV12 GV09 GV07 GV01 GV06 GV20 Area 2 GV28 GV27 GV26 GV18 GV19 GV21 GV29 GV16

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

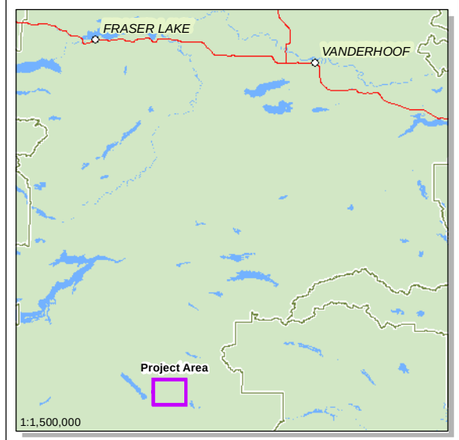
LEGEND

Base Features (20k)
- Contour - Index
- Contour - Intermediate
- River/Stream - Definite
- River/Stream - Indefinite
- Waterbody
- Wetland

Land Use
- Cutblock

Access
- Road - Other

Assessment Features
- Project Area
- Control Grassland Plot
- Control Treed Area 1 Plot
- Control Treed Area 2 Plot
- Treated Grassland Plot
- Treated Treed Area 1 Plot
- Treated Treed Area 2 Plot



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Prescribed Burn Vegetation Monitoring Plots

Euchiniko Sidehills

1:15,000

0 125 250 500 750 1,000m

NAD 1983 UTM Zone 10N
BCGS 20k Mapsheet: 93F.049
NTS 50k Mapsheet: 93F/08

ES07 ES06 ES08 ES14 ES09 ES10 ES16 ES18 ES13 ES17 ES12 ES15 ES19 ES20 ES11 ES01 ES02 ES03 ES04 ES05

Euchiniko River

EUCHINIKO GREY

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

Base Features (20k)
- Contour - Index
- Contour - Intermediate
- River/Stream - Definite
- River/Stream - Indefinite
- Waterbody
- Wetland

Land Use
- Cutblock

Access
- Forest Service Road
- Road - Other

Assessment Features
- Project Area
- Control Grassland Plot
- Control Treed Plot
- Treated Grassland Plot
- Treated Treed Plot

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6.2 APPENDIX 2 – COMBINED FIELD FORM

SERNbc SUPPLEMENTAL DATA FORM

Plot#:	Crew:	Date: yyyy-mm-dd

Overstory

Canopy Cover
◯ 1 – 0 -5% ◯ 4 – 50 -75%
◯ 2 – 5 -25% ◯ 5 – 75 - 95%
◯ 3 – 25 - 50% ◯ 6 – 95 - 100%

Height to live crown:
(general bottom of crown, not lowest live branch)

Comments:

Coarse Woody Debris (CWD –only > 7.5 cm)

Volume: LOW MODERATE HIGH	Length: SHORT MIXED LONG
Decay Class: INTACT DECOMPOSING DECAYED	Complexity: SINGLE COMPLEX

Comments:

Ungulate Use (pellet counts) Plot size: m

Transect	Plot	Sp.	# groups	Transect	Plot	Sp.	# groups

Comments:

V 1.0 2015-09-01

6.3 APPENDIX 2 – PHOTODOCUMENTATION; SELECTED PHOTOS FOR EACH TREATMENT

SERNbc Vegetation Monitoring Plots
Euchinko Sidehills – Control Grassland

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Date: Sept 7, 2015
Comments:
ES02

Date: Sept 6, 2015
Comments:
ES04

Date: Sept 6, 2015
Comments:
ES02

SERNbc Vegetation Monitoring Plots
Euchinko Sidehills – Treated Grassland

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Date: Sept 7, 2015
Comments:
ES12

Date: Sept 3, 2015
Comments:
ES13

Date: Sept 2, 2015
Comments:
ES14

SERNbc Vegetation Monitoring Plots
Euchinko Sidehills – Control Treed

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Date: Sept 1, 2015
Comments:
ES06

Date: Sept 5, 2015
Comments:
ES10

Date: Sept 5, 2015
Comments:
ES07

SERNbc Vegetation Monitoring Plots
Euchinko Sidehills – Treated Treed

Date: Sept 3, 2015
Comments:
ES17

Date: Sept 3, 2015
Comments:
ES18

Date: Sept 4, 2015
Comments:
ES19

SERNbc Vegetation Monitoring Plots
Grizzly Valley – Control Grassland

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Date: Sept 9, 2015
Comments:
GV01

Date: Sept 17, 2015
Comments:
GV02

Date: Sept 17, 2015
Comments:
GV05

SERNbc Vegetation Monitoring Plots
Grizzly Valley – Treated Grassland

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Date: Sept 8, 2015
Comments:
GV11

Date: Sept 10, 2015
Comments:
GV12

Date: Sept 15, 2015
Comments:
GV15

SERNbc Vegetation Monitoring Plots
Grizzly Valley – Control Treed (Area 1)

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Date: Sept 9, 2105
Comments:
GV06

Date: Sept 9, 2015
Comments:
GV07

Date: Sept 12, 2015
Comments:
GV10

SERNbc Vegetation Monitoring Plots
Grizzly Valley – Treated Treed (Area 1)

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Date: Sept 11, 2015
Comments:
GV16

Date: Seot 10, 2015
Comments:
GV20

Date: Sept 10, 2015
Comments:
GV19

SERNbc Vegetation Monitoring Plots
Grizzly Valley – Control Treed (Area 2)

ECOFOR
natural and cultural resource consultants

Date: Sept 19, 2015
Comments:
GV21

Date: Sept 15, 2015
Comments:
GV22

Date: Sept 9, 2016
Comments:
GV25

SERNbc Vegetation Monitoring Plots
Grizzly Valley – Treated Treed (Area 2)

ECOFOR
natural and cultural resource consultants

Date: Sept 18, 2015
Comments:
GV26

Date: Sept 18, 2015
Comments:
GV27

Date: Sept 19, 2015
Comments:
GV30

6.4 APPENDIX 4 – PLOT LOCATIONS

Euchiniko Sidehills

Strata	Plot	UTM	Date Assessed
Control Grassland	ES01	10U 412436 5919142	09/06/2015
	ES02	10U 412762 5918969	09/07/2015
	ES03	10U 412553 5918890	09/06/2015
	ES04	10U 412415 5918815	09/06/2015
	ES05	10U 412016 5918900	09/06/2015
Control Treed	ES06	10U 409124 5922041	09/01/2015
	ES07	10U 408631 5922075	09/05/2015
	ES08	10U 409196 5922036	09/01/2015
	ES09	10U 408707 5921932	09/02/2015
	ES10	10U 408662 5921860	09/05/2015
Treated Grassland	ES11	10U 412015 5919959	09/04/2015
	ES12	10U 410763 5920496	09/07/2015
	ES13	10U 409786 5921052	09/03/2015
	ES14	10U 408874 5921958	09/02/2015
	ES15	10U 411021 5920231	09/07/2015
Treated Treed	ES16	10U 409011 5921772	09/05/2015
	ES17	10U 410240 5921151	09/03/2015
	ES18	10U 409756 5921165	09/03/2015
	ES19	10U 411430 5920213	09/04/2015
	ES20	10U 411926 5920046	09/04/2015

Grizzly Valley

Strata	Plot	UTM	Date Assessed
Control Grassland	GV01	10U 400228 5902398	09/09/2015
	GV02	10U 395234 5903156	09/17/2015
	GV03	10U 395229 5903053	09/17/2015
	GV04	10U 394954 5902891	09/17/2015
	GV05	10U 395060 5902772	09/17/2015
Control Treed – Area 1	GV06	10U 400636 5902499	09/09/2015
	GV07	10U 400011 5902597	09/09/2015
	GV08	10U 398550 5902992	09/12/2015
	GV09	10U 399783 5902512	09/09/2015
	GV10	10U 398238 5903051	09/12/2015
Treated Grassland	GV11	10U 399510 5902959	09/08/2015
	GV12	10U 399147 5902532	09/10/2015
	GV13	10U 399317 5903199	09/08/2015
	GV14	10U 398560 5902523	09/11/2015
	GV15	10U 397697 5902722	09/15/2015
Treated Treed – Area 1	GV16	10U 397819 5901916	09/11/2015
	GV17	10U 398904 5902928	09/12/2015
	GV18	10U 397967 5902205	09/11/2015
	GV19	10U 398579 5902106	09/10/2015
	GV20	10U 399249 5902475	09/10/2015
Control Treed – Area 2	GV21	10U 396626 5902096	09/19/2015
	GV22	10U 397064 5902855	09/15/2015
	GV23	10U 395484 5903536	09/16/2015
	GV24	10U 395215 5903509	09/16/2015
	GV25	10U 396519 5903526	09/16/2015
Treated Treed – Area 2	GV26	10U 397135 5902280	09/18/2015
	GV27	10U 396735 5902249	09/18/2015
	GV28	10U 395865 5902489	09/19/2015
	GV29	10U 396580 5901933	09/18/2015
	GV30	10U 395811 5902795	09/23/2015