

CHURN CREEK BIGHORN SHEEP

MIGRATION CORRIDOR RESTORATION TREATMENTS.

Progress Report, 2008

prepared by

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INTRODUCTION

The Churn Creek herd of California bighorn sheep exhibit migratory behaviour, moving from summer range in the grasslands along Churn Creek near the Fraser River to alpine areas in Shulaps Mountains for the summer. The migration corridor used by these sheep follows a series of small cliff bands along Churn Creek (Figure 1). These cliff bands act as escape terrain for the sheep where they retreat to avoid predators and may rest or overnight in these protected locations during migration.

The habitat between the cliff bands has become more heavily forested in the past 100 to 120 years since fire exclusion has occurred throughout the region. The dense forest now found throughout much of the migration corridor is not favoured by bighorn sheep and may place them at higher risk to predation (Lemke 2004). The restoration of these migration corridors has been listed as an urgent priority to maintain migratory behaviours in wild sheep (Lemke 2004). The total area of the migration corridor is about 4500 ha, but the proportion of this area that is in need of habitat restoration has not been well examined.

A series of treatment units has been proposed to improve the habitat quality along important portions of the migration route with the goal of reducing predation losses on these sheep while they are migrating (Steele and Blackwell 2006). These units were selected as being both high value habitats and being considerably departed from historical conditions. The habitats now have an increased density of trees due to fire exclusion and the decreased abundance and diversity of forb and grass forage species associated with increased forest cover.

Most of the migration corridor falls within Provincial Crown Forest and habitat restoration for bighorn sheep requires exemptions from normal silvicultural requirements, but several areas of the migration corridor fall within the Cariboo Chilcotin grassland benchmark area. The grassland benchmark area was established under the Caribo Chilcotin Land Use Plan (CCLUP) and has the objective of long-term management for grassland values even if the sites are currently forested.

Treatment Unit 5 was selected for treatment in 2007 because a substantial area of grassland benchmark area was available in this unit and the unit is easily accessible. Only areas within the grassland benchmark in TU5 were treated in for treatment in 2007 so that work could proceed without requiring MoFR approval. Work was continued in these areas in 2008 with an additional area selected in the provincial crown forested land base that can be commercially harvested by the forest licensee to restore habitat values. Preliminary work on layout of this block was completed, and harvest of the area may commence as early as 2009.

All tree removal activities completed in 2007 and 2008 lie within the grassland benchmark areas and all fall within the very dry, cold sub-boreal pine spruce (SBPSxc) biogeoclimatic subzone. Forests in the area are dominated by lodgepole pine (*Pinus contorta*), with scattered Douglas-fir (*Pseudotsuga menziesii*), trembling aspen (*Populus tremuloides*), hybrid spruce (*Picea glauca* X *engelmannii*) and white-bark pine (*Pinus albicaulus*). Mountain pine beetle

Dendroctonus ponderosae has killed much of the larger lodgepole and white-bark pine in the area. Most of the steep, well drained, warm aspect sites in the area are still open and dominated by herbaceous vegetation, but forest encroachment has occurred on most formerly grassland areas. The trees on these sites are young and often closely spaced. Fire history has not been examined at the site, but most of the larger, older trees on the site have multiple fire scars, suggesting that the historical fire regimes in the area may have been frequent, low-intensity stand-maintaining fires.

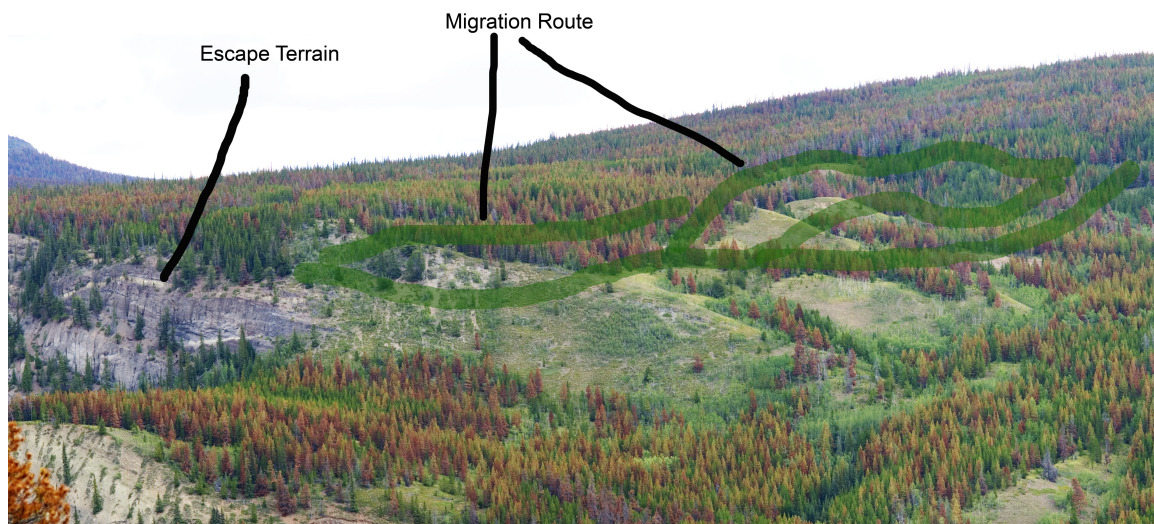


Figure 1. Overview of project area.

TREATMENT AREAS

Five treatment areas were laid out in the field in 2007 with slightly different habitat conditions and therefore different prescriptions (Figure 2). Treatments were begun in Unit 1 in 2007 and completed in 2008. Unit 2 was started and finished in 2008. Unit 1 had the highest pre-treatment tree density of all

established units and is the largest at 4.9 hectares. It also has the greatest habitat potential of all unit as it lies adjacent to heavily used cliff band escape habitat. Bighorns travel through TU1 from a heavily used cliff band below the unit to another cliff band uphill and to the west. Tree density was measured at 5 plots throughout the treatment area, and ranged from 660 to 3120 stems per ha (sph). Average stem density was approximately 2000 sph. All ingrowth was lodgepole pine, but older Douglas-fir and whitebark pine were found along the cliff band at the northern edge of the unit. There were no large veteran trees in the unit except a few stems scattered along the top of the cliff band and all cut tree examined were between 50 and 80 years old.

The prescription in TU1 was to cut all stems less than 20 cm diameter at breast height (DBH) and pile for later burning. The cut material was piled because the high tree density in this TU would have resulted in unacceptable quantities of coarse woody debris. This debris would both pose a high fire risk and impede movement of sheep and other wildlife through the area and provide ambush cover for predators. Piles will be burned once cured, probably in the winter of 2008-09. The treatment was not completed in Unit 1 in 2007, the total area of the unit was not cleared and some parts of the treated area had stems left that should have been cut. Cutting was finished in Unit 1 in 2008 resulting in increased debris piles and a larger area cleared.

Unit 2 is uphill from Unit 1 and is slightly steeper. The area to be treated lies to the east of an existing grassy slope that leads up to another cliff band that is also heavily used by sheep. This unit has generally larger trees than unit 1 but at lower densities. Density measured at 3 plots in this unit ranged from 580 to 2160 sph with the unit average about 1500 sph. The unit is more steep than Unit 1 and that along with the larger trees slowed piling activities. Piles are somewhat smaller than in Unit 1 and in one place a windrow was created by falling trees into a linear row. Treatment of this unit was completed in 2008.

Costs

Cost per hectare is presented in Table 1. The cost per hectare for each year

is approximate as the total area treated in 2007 was not measured and some of the area treated in 2007 needed further work in 2008. Total cost per hectare for the entire area is

Table 1: Costs of restoration treatments in the Churn Creek Migration Corridor in 2007 and 2008.

Year	Unit	Area	Treatment Cost	Layout and Supervision Costs	Cost per hectare
2007	1	Approx 3.0	\$10,485	\$5000	\$5162
2008	1	1.9	\$19,500	\$5000 ¹	\$4224
	2	3.9			
Total	1 and 2	8.8	29,985	\$10000	\$4544

¹This cost includes reconnaissance of an additional 80 to 100 hectares of area in TU 4 to the east that will be treated in 2009.

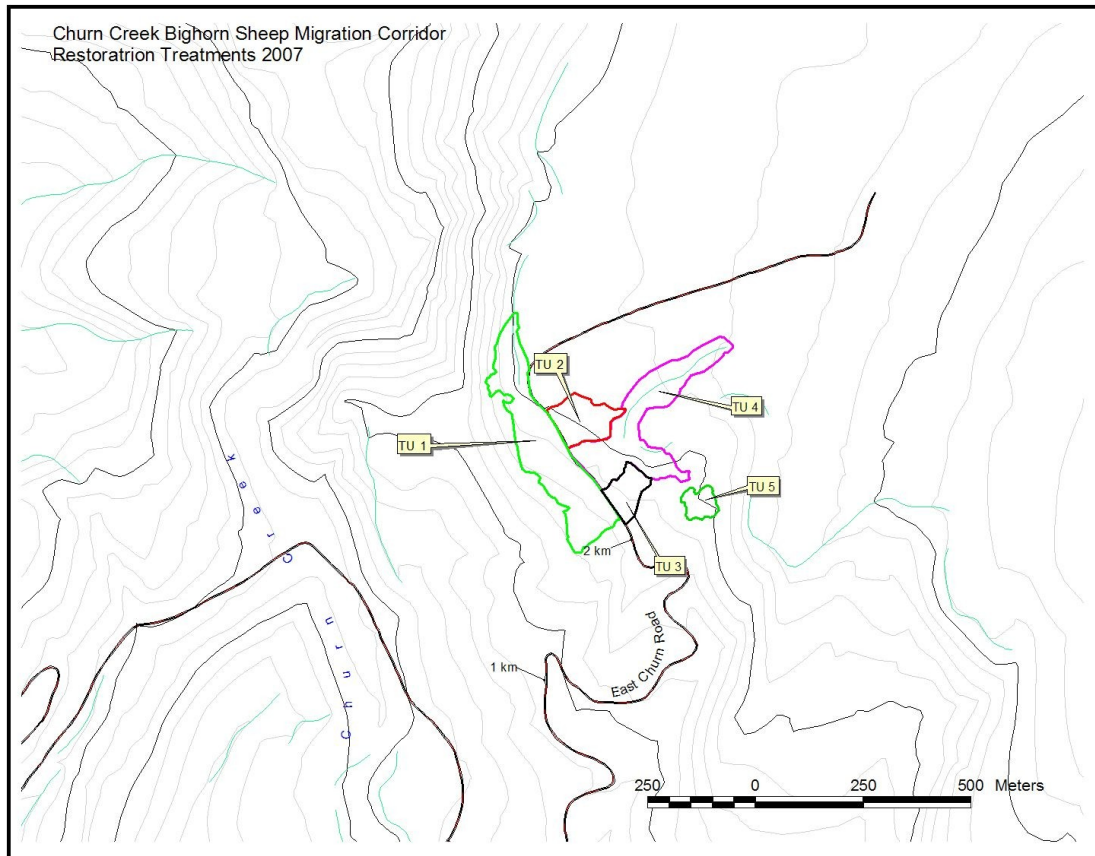


Figure 2. Individual treatment areas in TU5 for bighorn sheep habitat restoration established in 2007.



Figure 3. Site 1 before treatment in 2007.



Figure 4. Site 1 after treatment in 2007.



Figure 5. Site 2 before treatment in 2007.



Figure 6. Site 2 after treatment in 2007.



Figure 7: Overview of TU 5 in 2007 before work started.



Figure 8: Overview of Treatment Unit 5 after work was completed in 2008.



Figure 9: Overview of treatment unit 5 looking north towards the cliff band escape terrain.

LITERATURE CITED

Lemke, S. L. 2004. Management Plan for California Bighorn Sheep in the Fraser River basin, British Columbia. The Fraser River Bighorn Sheep Advisory Committee. Kamloops, BC. 124 pp.

Steele, F.A., and Blackwell, B. A. 2006. Churn Creek Bighorn Sheep: Migration Corridor Restoration. Report submitted to B. Bings, Ministry of Environment, Williams Lake.