ROCKY MOUNTAIN TRENCH ECOSYSTEM RESTORATION PROGRAM

BLUEPRINT FOR ACTION 2013 PROGRESS & LEARNINGS 1997-2013

Rocky Mountain Trench
Ecosystem Restoration Program

Restoring Nature's Balance.

THE ROCKY MOUNTAIN TRENCH Ecosystem Restoration Program is a collaborative undertaking by 30 partners to restore grasslands and open forests in the East Kootenay and Upper Columbia Valley region of southeastern British Columbia.

Restoration produces enduring benefits for plants, animals and people:

- more abundant natural forage for domestic livestock and wild ungulates, particularly elk, deer and bighorn sheep
- improved habitat for wildlife species that are endangered, threatened or of special concern
- healthier forests that are less susceptible to disease and insect attack
- reduced risk of severe wildfire near communities and across the landscape
- ecosystems that are more resilient to a changing climate.

The Trench ER Program was launched in 1998 to restore grassland and open forest ecosystems on Crown land. The program now includes restoration in provincial and federal parks, on private conservation properties and First Nation reserves. Program partners represent:

- government ministries and agencies
- First Nations
- the forest, ranching and guide-outfitting industries
- wildlife conservation and hunting associations
- land conservation trusts
- naturalist and environmental societies, and other citizen stakeholder groups.

The restoration program in the Trench was the first in BC and has become the model for other similar programs in the province.

BLUEPRINT ONLINE

This pamphlet is a condensed version of *Blueprint for Action 2013*. The complete 48-page edition of text, photos and maps is available at www.trench-er.com.

FOREST CHANGE OVER TIME. At left: an open stand of mature ponderosa pine photographed near Wildhorse Creek, Fort Steele, by George Mercer Dawson (National Archives of Canada). Middle: the same area, 130 years later, showing how the open forest has filled in and Douglas-fir has replaced ponderosa pine as the dominant tree species. Right: a grassland restoration site on the northeast side of Koocanusa Reservoir after logging. Restoration here has improved grazing for domestic cattle and elk, and browsing for mule deer and white-tailed deer.

VISION

We envision a restored landscape functioning at its ecological potential and thereby supporting:

- The native and historical matrix of trees, plants and animals
- A sustainable forage resource for wild and domestic grazing ungulates
- Social, economic and cultural needs as they relate to the Open Range and Open Forest landscapes of the Rocky Mountain Trench.

OPEN RANGE & OPEN FOREST

Approximately 250,000 hectares of Crown land in the Trench are classified as fire-maintained ecosystem. The total has been separated into four ecosystem components: shrublands, open range (grasslands), open forest and managed forest. The ER Program focuses on restoring the open range and open forest components (about 109,000 hectares). Restoration treatments are aimed at reducing tree density as follows:

- Open Range: less than 75 stems per hectare (sph), with a target of 20 sph
- Open Forest: a range of 76 to 400 sph, with a target of 150 sph.

FIRE ECOLOGY – The low-elevation grasslands and open forests of the southern Rocky Mountain Trench are "fire-maintained" ecosystems. Vegetation here has become adapted to fire over thousands of years, the result of low-intensity surface fires ignited by First Nations people and lightning strikes.

Forest scientists who study fire-scarred trees have found that the dry Douglas-fir and ponderosa pine forests in the valley bottom burned every 15 years on average. This frequent fire regime began to change around 1890 with European settlement, and ended abruptly in 1940 as organized fire suppression largely removed fire from the landscape.

The outcome of many decades of fire exclusion is a gradual, multiple shift: open grasslands become treed grasslands; treed grasslands become open forests; and open forests become closed forests. A Canadian Forest Service study of the area around Ta Ta Creek showed that fully half of the area of grassland and open forest had shifted to closed forest between 1952 and 1992. The study predicted that the entire area would become closed forest by 2032 if no corrective action were taken.

The Trench ER Program was established to take the corrective action necessary to deal with forest ingrowth and encroachment, and to restore the rich ecological diversity of the region's grasslands and open forests.

STRATEGY – The program's Steering Committee is responsible for strategic planning. The committee's original goal was to restore 135,000 hectares of Crown land to Open Range or Open Forest condition by 2030, and maintain those conditions in perpetuity.

Now, with 15 years of operational experience, the strategy is evolving, mainly to accommodate the reality of very restricted weather "windows" for prescribed burning. Reducing the total operating area is being considered. This would involve concentrating the full range of restoration treatments, including follow-up maintenance, on the highest priority sites, those with potential for producing the best ecological outcomes.

On sites not designated as high priority, forest stands would be thinned by hand or mechanical means but not maintained with prescribed fire. An emerging option for low-priority sites is development of a local bioenergy industry that would utilize marginal "Trench" wood as feedstock for small-scale heating systems. This potential market could contribute to restoration goals by providing an economic incentive to thin ingrown forest stands.

Another strategic development involves opening the forest canopy along mid-elevation mountain drainages to provide migration corridors for wild ungulates. Linking low-elevation winter ranges to higher elevation summer range is expected to facilitate migratory behaviour of elk, thereby reducing agriculture conflicts and grazing pressure in the Trench. These migration routes will also benefit mule deer and bighorn sheep which are at risk due to habitat loss.

OPERATIONS – The Operations Committee is responsible for planning and delivering restoration projects within the ER Program's operating area, which extends from Radium Hot Springs to the US border. Local governments implementing wildfire protection plans participate at the planning stage so fuel management projects can be coordinated with restoration workplans.

A typical restoration project cycle takes about 5 years, from planning to prescribed burning. Every project requires a prescription, a detailed plan that spells out how a site will be restored, maintained and monitored. The prescription sets restoration objectives and describes how a wide range of resource values will be addressed.

On-the-ground treatment starts with thinning to reduce forest stands to Open Range or Open Forest density. Most stands require a mechanical thinning treatment. Commercial logging by forest licencees is the preferred method but is not always an economic option because timber on restoration sites is generally of poor quality and low volume.

On sites with low-volume, non-merchantable wood, the ER Program uses other thinning methods. Small trees are hand slashed with chainsaws, piled and burned. Larger trees are cut, chipped and scattered using mastication attachments on skid steers or excavators.

Once a site has been thinned, the next step is to re-introduce fire with a prescribed burn. Prescribed fires keep tree regeneration in check, rejuvenate native grasses and shrubs, recycle nutrients in the soil, and remove debris left after thinning.

The big challenge to prescribed burning is restricted burning windows. Fires can be lit only when fuel conditions favor a low-intensity burn that can




ROCKY MOUNTAIN bighorn sheep, Lewis's woodpeckers, American badgers and mule deer are some of the wildlife species that benefit from restoration of the region's grasslands and open forests.

be easily controlled within established fireguards, and when venting conditions comply with government smoke control regulations. Even on a good burning day, successful ignition can be restricted to just a few hours when temperature and relative humidity are most favorable.

The past 15 years of restoration operations shows that, on average, fewer than 4 prescribed burns are successfully carried out in a year. Maintaining the total operating area in Open Range or Open Forest condition, however, would require roughly 16 prescribed fires every year. As a consequence, the ER Program will focus on burning only the highest priority sites.

Statistics on restoration treatments can be found in the complete edition of *Blueprint for Action 2013*.

MONITORING – Monitoring is important because it informs land managers and the public about the effectiveness of restoration treatments. Without monitoring, it is impossible to tell if restoration objectives are being achieved. The ER Program recently assembled monitoring data collected over 12 years, then analyzed results.

The overriding story from the analysis is that plant community response is highly variable, depending on the type of site, restoration treatments applied, and time elapsed since treatment. Restoration has produced good response from shrubs, an important resource for wildlife, but has not resulted in an overall increase in bunchgrasses, the principal diet of grazing cows and elk.

Bunchgrass response is unexpected and disappointing, given its importance as forage. Lack of bunchgrass response could be due to several factors: variations among sites, the complexity of grassland ecology, and impacts of grazing.

The increase in shrub production, on the other hand, is good news for a variety of wildlife species. Shrubs have high nutritional value for browsing wild ungulates, especially mule and white-tailed deer, and are vital as winter forage. Shrubs also provide nesting and foraging opportunities for birds, and habitat for insects that birds eat.

A significant decline in non-native species cover across all sites is also encouraging. This indicates that restoration activities are not leading to an increase in non-native species, which was a common concern among restoration practitioners.

Examination of the monitoring data is in the early stages and results have to be distilled further. Results to date reflect the operational reality of ecosystem restoration. Ground conditions, such as soil, slope and aspect, vary widely among sites, and will influence plant community response to treatment. There are also many external factors, such as grazing and precipitation, that affect response.

ER PROGRAM FUNDERS 1997-2013

Support from the following has paid for restoration and fuel management treatments on Crown land, as well as scientific research and monitoring, mapping, database development, public outreach and communications.

Job Opportunities Program	$ 3,460,288
First Nations Emergency Services Society	1,626,767
Land Based Investment Account	1,521,358
Fish and Wildlife Compensation Program – Columbia Region	1,542,137
Community Adjustment Fund	1,221,813
Forest Investment Account	1,085,889
Habitat Conservation Trust Foundation	809,685
Forest Renewal BC	433,490
Grazing Enhancement Fund	422,567
Steering Committee Fund – supplemented by FLNRO	408,052
Columbia Basin Trust (CBT) Environmental Initiatives Program	299,524
Community Gaming Grant	266,000
Rocky Mountain Elk Foundation	231,295
Union of BC Municipalities	203,135
BC Wildfire Management Branch	184,518
BC Ministry of Forests, Lands and Natural Resource Operations (FLNRO)	120,291
Kootenay Livestock Association (KLA) – Ministry of Forests grant	75,564
BC Ministry of Agriculture	49,058
BC Ministry of Environment	49,027
BC Cabinet Land Use Committee	46,300
CBT Grassland & Rangeland Enhancement Program – KLA	40,900
Enhanced Forest Management Program	31,437
Fraser Basin Council BC CLEAR Fund	22,500
Village of Canal Flats	20,000
Premier's Sheep Fund	19,370
BC Ministry of Transportation and Highways	16,177
Agriculture Environment & Wildlife Fund	16,000
BC Wildlife Federation	16,000
Human Resources Canada	10,033
Small Business Forest Enterprise Program	9,138
TOTAL	**$14,258,313**

THE RESTORATION PROCESS. Clear Lake Pasture south of Jaffray before thinning, during a prescribed burn, and after thinning and burning.

PARTNERS

- BC Ministry of Agriculture
- BC Ministry of Environment
- BC Parks and Protected Areas
- BC Ministry of Forests, Lands and Natural Resource Operations
- BC Timber Sales
- BC Wildfire Management Branch
- Fish & Wildlife Branch
- Range Branch
- Rocky Mountain Natural Resource District
- Canadian Forest Products (Canfor)
- East Kootenay Wildlife Association
- Fish and Wildlife Compensation Program, Columbia Region
- Galloway Lumber Company
- Grassland & Rangeland Enhancement Program (Columbia Basin Trust)
- Kinbasket Development Corporation
- Kootenay Livestock Association
- Ktunaxa Nation Council
- Nupqu Development Corporation
- Parks Canada (Kootenay National Park)
- Range Advisory Committee
- Rocky Mountain Trench Natural Resources Society
- (representing Cranbrook Archery Club, Cranbrook Community Forest Society, East Kootenay Wildlife Association, Kootenay Livestock Association, Rocky Mountain Naturalists, Southern Guides & Outfitters Association, The Land Conservancy of BC, Waldo Stockbreeders Association, Wildsight, Windermere District Farmers Institute)
- Shuswap Band Council
- The Nature Conservancy of Canada
- The Nature Trust of British Columbia

TRENCH ER

Restoring Nature's Balance.

www.trench-er.com

Blueprint for Action 2013 was produced with the financial support of the following:

Columbia Basin trust

FISH AND WILDLIFE COMPENSATION PROGRAM
A partnership between BC Hydro, the Province of B.C. and Fisheries and Oceans Canada

HABITAT CONSERVATION TRUST FOUNDATION

BRITISH COLUMBIA | Ministry of Forests, Lands and Natural Resource Operations

Date of publication: December 2013

RESTORATION SITE on Airport Pasture south of Ta Ta Creek.

LOOKING AHEAD – Ecosystems are complex; restoring them is a slow and sometimes painful process that requires ongoing commitment and continuous learning.

"Adaptive management" – the process of continually improving outcomes by learning from experience – is a guiding principle for the ER Program. An evolving strategy, recent monitoring results, and concerns about restoration logging impacts all require new initiatives, using the principle of adaptive management. Going forward, the Steering Committee will pursue the following initiatives:

Strategy

- Identify and prioritize specific Open Range and Open Forest sites for full restoration treatment and continuing maintenance.
- Identify mid-elevation wildlife migration corridors for restoration.
- Continue to refine the range of treatments in response to emerging technologies and markets.

Monitoring

- Use the new intensive and routine monitoring protocols for all future monitoring.
- Enter all data consistently in the ER Program monitoring database.
- Re-measure most existing intensive monitoring plots to gather actual counts of trees removed and trees retained.
- Carry out a meta analysis of existing intensive data so that dissimilar methods of data collection will yield trends in vegetation response to treatment.

Operations

- Adopt the Best Management Practices to be recommended by the Operations Committee. Restoration logging practices have sometimes produced unacceptable outcomes related to soil disturbance and erosion, invasive plants, residual debris, and rehabilitation of roads, landings and skid trails. A new sub-committee of the Ops Committee is developing a set of best management practices to address these issues. As the project progresses, developments will be reported in the ER Program newsletter and posted on the website.