

Supporting Document for the Sicamous Creek Research Area and the Upper Penticton Creek Research Area

September 25, 2014

The following information is provided as support to the order identifying the Sicamous Creek Research Area and the Upper Penticton Creek Research Area as a resource feature. This information has been prepared by provincial agency staff responsible for the research projects and is intended to provide an understanding of the goals and expected management for the area.

This document is not legal direction and is not part of the order.

The Sicamous Creek Research Area

Background

The Sicamous Creek Silvicultural Systems Project (SCSSP) was initiated by the Ministry of Forests Research Program in the early 1990's in response to concerns about the sustainability of clear-cut harvesting, forest regeneration, and impacts to aquatic and terrestrial biodiversity in high elevation ecosystems. The SCSSP is part of a network of long-term and large-scale interdisciplinary silvicultural systems trials that were established across BC. The level of work conducted at the site fluctuates from year to year with funding levels and as determined by a remeasurement protocol, but ongoing maintenance and the collection of critical information remains a priority.

The SCSSP is unique provincially as it is the only large-scale, long-term research site examining silviculture and harvesting options that are directly relevant to the management of the approximately five million hectares of ESSF forest in southern BC and which has a robust experimental design. Provincially, there are two additional ESSF installations in central BC; the Quesnel highlands trials which emphasize mountain caribou management options and the Lucille Mountain project to the east of Prince George that was established to examine high elevation forest management in central and northern BC.

The Sicamous Creek Research Area contains an intensive research area with a rigorous experimental design established in 1992, paired with an adjacent operational demonstration area. The design of the experimental research trials is cumbersome and unnecessarily difficult to implement operationally; what is relevant is the information gleaned from the research work. The operational demonstration area is intended to function as a venue where information from the intensive research area or relevant provincial research and monitoring programs is applied in an economically and logistically viable manner to address specific or integrated resource management issues. This approach is consistent with, and also an essential underpinning of the FRPA at the conceptual level (see R. Reader 2006 "The expectations that affect the management of public forest and range lands in British Columbia: Looking outside the legislation"), and the objectives set by government for the Okanagan – Shuswap LRMP. Government objectives for the OSLRMP within the proposed Sicamous Creek Research Area include maintaining enhanced levels of coarse woody debris, visual quality for tourism, and forage, cover and connectivity for marten and fisher. These objectives, along with riparian and small stream management, slope and terrain stability and road and drainage development to maintain community water supplies represent a suite of objectives that are well suited to developing and implementing cost-effective harvesting solutions within an adaptive management framework. The demonstration area is critical to the success of the Sicamous Ck. Silvicultural Systems initiative as it represents the area where research findings can be reconciled with operational logistics and costs. Such an application can help reconcile the public investments (funds and person years of research effort) made at the intensive research site via the development of innovative and cost-effective solutions relevant to social concerns about current forest management practices. This will

help ensure that social expectations continue to be addressed and that due care and diligence is a component of operational prescriptions.

Purpose

The SCSSP intensive research trials have two main objectives:

1. To develop a research program to identify the costs and benefits of existing and potential new forest management activities on a range of economic, social and ecological values.
2. To identify and implement practices that address concerns about high elevation forest management.

By design, the Sicamous Creek Research Area has been subject to numerous harvesting and silvicultural treatments in accordance with the SCSSP plans and is the area where the direct monitoring of harvesting and silvicultural treatments is undertaken. Primary forest activities need to continue within this area, however, for the ongoing research project to remain effective and viable, any timber harvesting (including salvage) or silviculture activities (including forest health) within the area must be compatible with the existing and planned research treatments. Activities that do not respect the spatial pattern of existing or planned treatments or the combination of harvesting and silvicultural activities established in the initial treatments would compromise investments in the existing research trials and undermine critical second and third pass monitoring.

The three key objectives of the demonstration area are:

1. To develop and apply operational versions of effective harvest and silviculture treatments identified in the adjacent Research Area and elsewhere.
2. To provide a venue where emerging social and environmental concerns about high elevation forest management are discussed and operational solutions developed and demonstrated.
3. To expand on the limited set of harvest and silvicultural treatments applied in the Research Area and to evaluate the success of these treatments and their utility for wider application in high elevation ecosystems.

The demonstration area also provides an opportunity to help identify and resolve emerging social and environmental issues that may not be accounted for in the Research Area. As an example, recent concerns about slope and terrain stability and watershed management in the Sicamous Creek and Hummingbird Creek drainages have been identified and are issues that need to be addressed when planning forest development within the demonstration area.

Implementation

Primary forest activities are encouraged to be continued within the demonstration area, and professionals planning or conducting operations within the area should consult with provincial government research staff (within the Ministry of Forests, Lands and Natural Resource Operations) responsible for managing the SCSSP. Research staff familiar with the SCSSP can play a role in ensuring results from the Research Area and elsewhere are used and applied in an unbiased and operationally feasible manner. This communication will greatly assist in the success of the SCSSP.

Prior to conducting primary forest activities¹ within the Sicamous Creek Research Area, agency research staff with the Ministry of Forests, Lands and Natural Resource Operations responsible for managing the SCSSP should be consulted regarding existing or planned research activities to help ensure the SCSSP objectives are not jeopardized. Plans that are inconsistent with the objectives of the Research Area or may otherwise impact its effectiveness would likely require an exemption under the FRPA to permit the activity.

Where natural disturbance events (such as a windthrow, wildfire or spruce bark beetle outbreak) require management actions that may be inconsistent with the objectives of the Research Area or the demonstration area (described below), it is recommended that the provincial government research staff (within the Thompson Okanagan Regional Office of MFLNRO) be contacted to assist in designing actions that are more likely to be compatible with the objectives for the Research Area, or consider modifying the research design to accommodate evolving conditions. This communication will also greatly assist in the success of the SCSSP.

Periodic reporting out on activities and research conducted within the Research Area including proposed treatments, plans, reports, and research staff contacts is available at the following website:
<http://www.for.gov.bc.ca/rsi/research/sicamous/index.htm>

It is expected that professionals planning operations in the Sicamous Research Area will consider the requirements of the intensive research and the objectives of the adjacent demonstration area. The demonstration area represents an area where resource management professionals will be relied upon to develop innovative solutions that are consistent with the objectives for the area. Research staff will continue to be available to facilitate this process as required. The area will be monitored over time to determine if it is being managed effectively as a demonstration area.

It is expected that forest development planning in the demonstration area will give due consideration to issues that are of known concern in the area as indicated in the OSLRMP objectives. Some of the issues regarding harvesting in high elevation forests include:

1. Regeneration and sustainable management in ESSF forests
2. Sustainability of clear cut harvesting
3. Riparian and small stream management
4. Visual quality and management
5. Water quality and quantity
6. Slope and terrain stability
7. Biodiversity impacts and managing for species of concern
8. Potential road and drainage impacts on community water supplies

Ultimately, information gained through this research will assist forest management throughout the ESSF.

Additional Information

Additional information on the SCSSP, proposed treatments, plans, reports, and research staff contacts is available at the following website:
<http://www.for.gov.bc.ca/rsi/research/sicamous/index.htm>

-
1. “Primary forest activities” are defined in the FRPA *Forest and Range Practices Regulation* as:
a) timber harvesting; (b) silviculture treatments; (c) road construction, maintenance and deactivation.

Supporting Document for the Upper Penticton Creek Research Area GAR Order September 25, 2014

The following information is provided as support to the order identifying the Upper Penticton Creek Research Area as a resource feature. This information has been prepared by provincial agency staff responsible for the research project and is intended to provide an understanding of the goals and expected management for the area.

This document is not legal direction and is not part of the order.

The Upper Penticton Creek Watershed Experiment

Background

The Upper Penticton Creek watershed experiment was established by the BC Forest Service in 1984 to address questions regarding the effects of logging on water supplies from headwater streams in the Okanagan Basin. This is the only watershed experiment of its kind in BC, as a result of its location, rigorous design, diversity of research and length of hydrometric record.

The research site is located on the Okanagan Plateau approximately 26 km northeast of Penticton, BC and includes the watersheds of 240, 241 and 242 (Upper Dennis) Creeks; all small headwater tributaries to Penticton Creek. Each watershed covers approximately 5 square kilometers from 1600 to 2100 meters in elevation. These watersheds are typical of the upland source area supplying water to the Okanagan Valley. All watersheds are forested; 240 and 241 Creek with lodgepole pine and Upper Dennis Creek with Engelmann spruce, subalpine fir and some lodgepole pine. Mature trees are over 100 years old and up to 24 m tall.

The 240, 241 and 242 Creek watersheds remained unlogged until 1995, except for a small area of blowdown salvage in 1992. The experiment follows a paired, pre- and post-treatment design. The 240 Creek watershed remains an unlogged experimental control. This control is essential to the experiment. Measurements in the control ensure that the hydrologic response to annual variations in the weather can be separated from changes associated with development and, in future, with forest regrowth.

Road construction and clearcut logging began in late 1995 and progressed in phases interspersed with monitoring periods. By late winter of 2007, 47% of the 241 and 52% of the Upper Dennis Creek watersheds had been clearcut. Logging was completed using conventional ground-based techniques. All cutblocks have been reforested and non-essential roads deactivated. Second growth stands are fully restocked with lodgepole pine, some Engelmann spruce and subalpine fir.

Streamflow measurements began in 1985. Since then a network of weather stations and snow survey grids have been established. The hydrometric measurements form the basis of all research at the site. Continuity in the measurements is essential for all analysis of natural environmental variability, changes resulting from disturbance and regrowth and response to a changing climate. Water quality monitoring began in 1992. In 2007, two deep (30 m and 50 m) wells were drilled at high elevation in the 241 Creek watershed. Permanent stations to monitor channel change have been established on all three streams.

Early research focused on seasonal and annual water yield tracking changes in water supplies with increasing extent of clearcut logging. More recently the scope of the experiment has expanded to include process and response studies as well as hydrologic modelling. Study topics now include the water balance, nutrient transport, forest-snow interactions, water quality, aquatic ecology, channel morphology, groundwater, the effects of climate change on water supplies and the economic effects of diverse water management scenarios.

The Upper Penticton Creek experiment has always been a collaborative undertaking between the provincial and federal governments and Weyerhaeuser Co. Ltd. Over the years research, extension and educational opportunities at the site have expanded as a result of the wealth of background information and through additional collaboration and partnerships with FORREX, Gorman Brothers Lumber Co. Ltd., the Okanagan Basin Water Board, the Okanagan Nation Alliance, Simon Fraser University, Thompson Rivers University, University of British Columbia, University of Lethbridge, University of Saskatchewan, and Weyerhaeuser Co. Ltd.

Purpose

The Upper Penticton Creek Watershed Experiment was established in 1984 to:

- improve our understanding of hydrologic processes in the southern interior,
- quantify changes in hydrologic processes as a result of forest disturbance and regrowth, and
- develop planning tools and guidelines for sustainable timber and water production in the Okanagan Basin.

Long-term experiments and environmental monitoring at Upper Penticton Creek focus on streamflow, water quality, snow accumulation and melt, the water balance, channel processes, nutrient cycling, aquatic ecology, and groundwater. With these data and results as the foundation, researchers are also working with computer models to understanding the effects of climate change, increasing water demand, alternative management strategies, and extensive natural disturbance on long-term water supplies.

Implementation

Forest development and reforestation within the experimental watersheds has been undertaken by Weyerhaeuser Co. Ltd. to current operational standards. This approach was taken to ensure that cutblock design, logging and road construction methods, and silvicultural practices were identical to those routinely applied across the landscape. Development plans for each phase of logging were completed by Weyerhaeuser in consultant with the Upper Penticton Creek technical committee. This committee is comprised of researchers and a representative of each government, industry and community partner. Research projects were then designed to monitor hydrologic, geomorphic and ecological response to these operational treatments.

It is intended that this approach continue into the future. Additional development is possible in the treatment watersheds (241 and 242 Creeks). Forest cover within the control watershed (240 Creek) must be retained for as long as possible, as mentioned previously to ensure that the hydrologic response to annual variations in the weather can be separated from changes associated with development and, in future, with forest regrowth. Forest cover in past clearcuts is now growing rapidly. It is possible that once these stands have 'recovered', from a hydrologic perspective, that experiments involving logging in the control may become experimentally acceptable.

The value of long-term installations, such as the Upper Penticton Creek watershed experiment, only increases over time. Long-term hydrometric datasets in BC are rare and the length plus breadth of information at Upper Penticton Creek are not available elsewhere in the southern interior. This type of experiment cannot be recreated elsewhere. Work has been done to find other undisturbed pairs of watersheds in the southern interior outside of parks. Such pairs no longer exist.

Data from Upper Penticton Creek have been used operationally, in research, hydrologic modelling and in the development of Climate WNA. Results of the research at Upper Penticton Creek have been published

in scientific journals, in technical papers, presented at international and local operational workshops and field trips and used in watershed assessment and development planning.

Additional Information

General information regarding: the research area, maps, data, results, publications and researchers is periodically updated at:

<http://www.for.gov.bc.ca/rsi/research/Penticton/index.htm>