NACFOR NAKUSP AND AREA COMMUNITY FOREST

UNIT 5 (WENSLEY) FUEL MANAGEMENT PRESCRIPTION SUMMARY
March 2023

Overview

A Fuel Management Prescription is developed based on technical field work and various professional assessments. The prescription is composed of documents and maps that outline the proposed treatment. It is used as a tool to guide and track operations.

Unit 5 (Wensley) is part of a community scale wildfire fuel break for the purpose of protecting values and infrastructure in the Wildland Urban Interface and Village of Nakusp. See *Unit 5 Fuel Management Overview Map* for geographic location.

The fuel management prescription considers multiple values. These values are regulated under the *Forest and Range Practices Act* and include but are not limited to riparian management, domestic water licences and licenced water works, soil disturbance related to roads, landslides and terrain stability, wildlife, biodiversity, recreation, visuals, archaeological and cultural heritage resources. The prescription meets legislated requirements of the *Act* and associated regulations.

Treatment Types. Note: See *Unit 5 Fuel Management Prescription Map* to reference all units.

Treatment Unit (TU) A – Understory and fine fuel reduction

- Treatment Strategy

  Reduce fine fuels (woody surface materials < 7 cm diameter) and ladder fuels (understory layer stems providing a fuel link for ground fire to reach the tree crowns in the upper canopy) in order to reduce opportunities for crown fire initiation in the event of wildfire.

  Moderate wildfire mitigation strategy as required to protect existing high value non-timber resources (consumptive water, recreation, visuals) within the unit.

  Recent Douglas-fir bark beetle attack has caused fresh mortality patches in the lower, westernmost part of TU A and west of the treatment boundary (see mapped locations). This will be managed separately from activities covered by this fuel treatment. Only attacked trees identified as a threat to worker safety will be removed during fuel treatment operations.

- Treatment Area

  34.4 hectares to be treated.

  Remaining area within this TU is composed of area reserved to protect a buried waterline (0.4 ha) and existing road/cross country ski trail access (0.5 ha).

- Treatment Methods

  Trees up to 17.5 cm Diameter at Breast Height (1.3 m) will be cut. Target tree spacing of retained trees following treatment is 3.2 to 3.9 meters.

  Prune branches on retained stems up to 2.5 metres to reduce ladder fuels.

  Reduce fine surface fuels (< 7 cm diameter) to a practical minimum. Pile + burn treated fuels.

  Ensure retained coarse woody debris (> 7 cm diameter) is non-elevated and non-continuous.

  Utilize a combination of small equipment and ground crews to implement treatment.

No mechanized equipment to be used within Koth Spring and Crown/Hallum Spring domestic watershed catchment areas; ground crews only. See mapped catchment boundaries.

All cut fuels will be non-merchantable. Dispose of cut fuels by burning in small piles during appropriate wildfire risk and smoke venting conditions.

Treatment Unit (TU) B – Full Crown Separation

- Treatment Strategy

  TU B operations will take place in two phases and is covered by two different types of documentation.

  - Road construction and merchantable harvest will take place first (see attached *Draft Harvest Plan Map* for additional details.)
  - Residual fine fuel and ladder fuel clean-up will follow harvest completion; this phase is covered under the fuel management prescription.

  Harvest majority of stems in high mortality, windthrow susceptible stand.

  Reduce amount and continuity of coarse surface fuels (stems > 7 cm diameter)

  Reduce fine fuels (woody surface materials < 7 cm diameter) and ladder fuels in order to reduce opportunities for crown fire initiation in the event of wildfire.

- Treatment Area

  Fuel treatment area is 7.8 ha

  Remaining 1.2 ha within this TU is composed of permanent road access proposed to access the treatment area and facilitate merchantable harvest. See the section titled *Measures Specific to Proposed Road Access* on Page 7 for additional details.

- Treatment Methods

  A. Merchantable Harvest

  Construct new road (Branch 2000 Extension) to access treatment area. See Page 7 for more.

  Utilize conventional logging equipment to harvest merchantable stems.

  Remove all trees *except* healthy Douglas-fir, western larch, white pine >/= 12.5 cm DBH and western hemlock >/= 37.5 cm DBH. Approximately 150 trees per hectare.

  Average tree spacing of retained stems following treatment is targeted to be between 7.6 and 10.7 meters.

  Pile non-merchantable coarse woody debris (CWD) that is not required to meet CWD retention specifications.

  Maintain at least 20 downed trees per hectare coarse woody debris (>7 cm diameter).

  Rehabilitate trails and landings to a state that supports tree regeneration as per prescription specifications.

  B. Post-harvest incremental fuel clean-up

  Utilize small equipment, ground crews or a combination of both to meet the following final treatment specifications:

- Prune branches on retained stems as required to ensure a minimum 2.5 meter height.
- Reduce fine surface fuels (< 7 cm diameter) to a practical minimum.
- Ensure retained coarse woody debris is non-elevated and non-continuous.
- Burn all piled debris.

C. Site Regeneration

Re-plant with fire resistant species to reduced stocking standards specified in the *Wildland Urban Interface (WUI) Stocking Standards for Selkirk Resource District South Columbia*.

The two photos below depict the high levels of ground and ladder fuels currently present in TU B.

Treatment Unit (TU) C – Fine fuel reduction and limited understory reduction

- Treatment Strategy

  Similar to TU A except that understory cutting will be considerably scaled down. Area was salvage logged in 2021 to address Douglas-fir bark beetle infestation; those harvest activities have already reduced the number of understory stems targeted for cutting.

- Treatment Area

  3.1 hectares to be treated.

  Remaining area within this TU is composed of existing road/cross country ski trail access (0.5 ha).

- Treatment Methods

  As per TU A.

Small equipment permitted for cutting and piling in other parts of the TU is restricted within the riparian management area on Brouse Creek bordering the TU.

Slightly wider post-treatment target tree spacing (3.7 to 4.5 meter average) compared to TU A reflects prior changes to stand structure resulting from 2021 salvage harvesting.

Treatment Unit (TU) D – Partial Crown Separation

- Treatment Strategy

  Follows same treatment specifications as TU B, retaining healthy Douglas-fir, western larch, and white pine >/= 12.5 cm DBH. However, treatment results will differ because there is a significantly higher component of the targeted leave trees in TU D than in TU B.

- Treatment Area

  Fuel treatment area is 3.9 ha

- Treatment Methods

  A. Merchantable Harvest

  Utilize conventional logging equipment to harvest merchantable stems.

  Remove all trees except Douglas-fir, western larch and white pine >/= 12.5 cm DBH.

  Narrower post-treatment target tree spacing (4.1 to 5.0 meter average) compared to TU B reflects significantly higher component of healthy Douglas-fir, western larch and white pine.

  Pile non-merchantable coarse woody debris (CWD) that exceeds CWD retention specifications.

  Maintain at least 20 down trees per hectare of coarse woody debris (>7 cm diameter).

  B. Post-harvest incremental fuel clean-up.

  As per TU B.

  C. Site Regeneration

  TU will be assessed post-harvest to determine whether the residual stand is fully stocked. Areas not deemed sufficiently stocked will be planted to *Wildland Urban Interface (WUI) Stocking Standards for Selkirk Resource District South Columbia*.

Measures Specific to Water Resources:

Watershed Management

- Watershed boundaries based on government data are identified on the *Unit 5 Fuel Management Overview Map*. These boundaries are defined by the direction of water flow, terrain features, and connectivity.
- Koth Spring, Crown/Hallam Spring and Hasrap Creek are the watershed catchment areas identified within the treatment area. See earlier sections of this report for specific treatments and treatment restrictions planned within these catchments.
- Hydrological findings made by Apex Geoscience with respect to each of the three catchment areas are as follows:
    - Koth Spring. Proposed treatment of TU A represents a very low risk of harm to water quality associated with soil disturbance and a low risk of harm associated with changes in volume and timing of flows.
    - Crown/Hallam Spring. Proposed treatment of TU B and TU D represents a moderate risk to water quantity and timing of flows (i.e; faster spring snowmelt) at domestic water intakes and a very low risk of harm to water quality associated with soil disturbance. See the next bullet point for specifics on how NACFOR will address the identified moderate risk.
    - Hasrap Creek. Proposed harvest of TU B represents a moderate risk of harm to water quality at domestic water intakes if measures to reduce erosion and terrain instability are *not* implemented. Implementation of appropriate mitigation measures will reduce the risk to low. See next bullet point for planned mitigation measures.
- Operations in association with this fuel treatment will conform to all final recommendations made by Apex Geoscience and Sitkum Geotechnical Consulting. NACFOR has also undertaken additional mitigation measures beyond those outlined in the assessment reports. Specific measures that have been or will be taken to address specific risk concerns noted above include the following:
    - Conversion of the steepest portion of TU B to hand treatment (northeastern portion of TU A);
    - Overstory tree cover retention within the Crown/Hallam catchment area portions of TU's B and D to exceed the 20% (TU B) and 40% (TU D) levels applied by Apex Geo to make the Equivalent Clearcut Area (ECA) hydrological impact calculations used to assess risk in their current report;
    - Post treatment rehabilitation of landing areas;
    - Post treatment road deactivation (culvert removal and waterbar and/or cross-ditch construction) and/or maintenance as per Sitkum recommendations.
- NACFOR is also undertaking to partner with Selkirk Innovates to conduct on site research into the varied effects of overstory tree cover removal on the timing of water flows.

Riparian Features

- Brouse Creek is an S3 stream that lies adjacent to the northern boundary of TU C. A small portion of the 20 m wide Riparian Reserve Zone lies within the boundary and will be reserved from treatment. Small equipment permitted for cutting and piling within the remainder of the TU will be restricted within the additional 40 m Riparian Management Zone (40-60 m from stream edge).
- Aside from Brouse Creek, only a small portion of one additional classified or unclassified riparian feature lies within the treatment area. The majority of this short S6 stream section lies within the existing cut right-of-way of Hairpin Road. TU A prescription specifications meet appropriate riparian requirements for the remainder.
- Hasrap Creek is an S6 (< 3 m wide, non fish-bearing, non community watershed) stream that lies adjacent to the east side of TU B and the northeastern polygon of TU A. 20 m wide riparian management restrictions will not affect the adjacent planned treatments.
- Branch 2000 Extension will cross the Crown Hallam catchment drainage area at an existing crossing on Ptarmigan Loop Cross Country Ski Trail. The crossing will be upgraded by installing a properly sized culvert to help maintain natural drainage patterns.

Points of Diversion (Licensed Water Users)

- All licensed water users with a Point of Diversion or waterline within or below the fuel treatment area have been contacted.
- The shallow, buried waterline that transects the property near the north portion of TU A is mapped and buffered from treatment.
- A second, deeply buried waterline along the treatment's south boundary is also mapped and is reserved from machine treatment and pile burning.

Measures Specific to Proposed Road Access

- The proposed road labeled Branch 2000 Extension will be used to facilitate harvesting of merchantable timber in TU's B and D.
- Spur 16 is a short (< 100 m long), proposed road extending off of Branch 2000. Its purpose is to help provide adequate space to deck harvested wood in TU D.
- The above two roads plus Skid Trail 1 extending off of Spur 16 will be built as permanent access structures. Their location and grades have been planned in coordination with the Arrow Lakes Cross Country Ski Club to facilitate future use as part of a planned ski trail expansion.
- Retaining the above structures as permanent also helps to improve a) access needs and b) defensible position options for suppression crews in the event of area wildfire.
- Following the completion of the fuel treatment, the permanent access structures will either be deactivated (i.e; culverts removed and replaced with water bars or cross-ditching) or fully maintained over the long term. The decision regarding deactivation versus long-term use will be made with consideration to geotechnical recommendations and ALCCSC trail requirements.
- Geotechnical assessment of and reporting on the proposed roads is currently underway.

Additional Values Addressed

- Visuals

  Visual Quality Objective (VQO) polygons are designated at the provincial level and are determined from the perspective of prominent public viewpoints such as highway corridors.

  All of TU's C and D and the majority of TU A are located within a mapped Partial Retention (PR) VQO polygon. Partial Retention objectives state that landscape alterations can be visible but must remain subordinate on the landscape.

  Overstory removal within TU A will be limited to stems posing a worker safety hazard; therefore, treatment will have no impact on the PR VQO.

  TU C treatment is focused solely on clean-up of prior harvesting and does not target any additional live overstorey trees to those already removed as part of a 2021 Douglas-fir bark beetle salvage operation. Visuals will not be impacted by treatment.

  TU D targets retention of approximately 40 % of mature stems within its 3.9 ha area. Small unit size and high retention levels will result in negligible VQO impacts.

  The remainder of the treatment is within a Not Visually Sensitive (NVS) polygon. However, it should be noted that treatment activities within all treatment areas will be visible to Wensley recreation users. The most visible landscape alterations will take place within the 9.0 ha TU B area; as outlined prior, post-treatment stem retention in this TU will result in average tree spacing ranging between 7.6 and 10.7 meters.

- Wildlife and Biodiversity

  No species at risk are known to be present within the treatment area.

  Mitigation strategies will be employed as follows to reduce the impacts of treatment on nesting habitat for migratory birds:

  - Strategic retention of up to 5% of the understory via targeted biodiversity patches;
  - Retention of 10-20 safe, dead standing trees per hectare, focusing on those with high nest potential; and
  - Treatment implementation will follow Standard Operating Procedures for the protection of migratory birds.

  The east boundary of TU B lies close to but outside a designated Old Growth Deferral Area.

- Public Safety

  Proper signage and communication will be posted prior to and during operations. Signage will be designed to ensure no public pedestrian or motorized access to the area in the vicinity of undergoing treatments and to provide adequate warning of logging truck activity (TU D operations) on Upper Brouse Rd and entry onto Highway 6.

Timelines

- Current state of various planning components:
  - Field reconnaissance. *Complete*.
  - Fuel management prescription data collection. *Complete*.
  - Road layout and surveying. *Complete*.
  - Forest health and Douglas-fir bark beetle assessment. *Complete.*
  - Boundary and treatment unit layout. *Mostly complete; some treatment boundary marking required.*
  - Riparian assessments. *Complete*
  - Riparian management layout. *Field marking to be completed prior to start of operations.*
  - Fuel management prescription. *Complete.*
  - Harvest Plan (Treatment Units B and D) documentation. *Complete.*
  - Hydrogeomorphic Assessment. *Complete (December, 2022).*
  - Terrain Stability Assessment. *To be completed, spring 2023*

- Planned Timing of Operations

  Scheduling for planned treatment operations has not yet been finalized and is dependent on contractor availability, markets, seasonal restrictions (i.e; wildfire season) and ski club operations.

Operation	**Target Start Date**	**Target Completion Date**
TU A and C fuel treatment	April 15, 2023	March 31, 2024
Branch 2000 / Spur 16 road construction	May 15, 2023	June 15, 2023
TU B harvesting	June 15, 2023	August 15, 2023
TU D harvesting	June 15, 2023	August 15, 2023
TU B incremental clean-up	August 16, 2023	March 31, 2024
TU D incremental clean-up	August 16, 2023	March 31, 2024

Pre and Post Treatment photos of a 2022 NACFOR fuel management project near Nakusp Creek south of Nakusp. The understory treatment implemented here follows the same cutting specification prescribed for TU's A and C in Unit 5, Wensley Creek.