DISTRICT OF MACKENZIE

REQUEST FOR PROPOSAL

Wildfire Fuel Reduction Treatment 2024
Demo Project FTU1 & FTU2

Issue Date: August 21, 2024
Closing Date: 4:00pm September 11, 2024

District of Mackenzie
Bag 340
Mackenzie, B.C. V0J 2C0
Attn: Micaiah Taylor

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Introduction

The District invites qualified and experienced firms to submit a proposal for operational wildfire fuel reduction treatments to achieve the targets and objectives of the "District of Mackenzie CRI 2023 Tree Crusher Demonstration Fuel Management Prescription" (ATTACHMENT 1). Proponents are invited to submit proposals as per the requirements of this request. All aspects of the FMP must be adhered to.

The District is not necessarily interested in obtaining the lowest price for this work. The quality of the service, relevant experience, schedule, methodology, equipment and resources to be used, safety, use of local resources, recovery of fibre, and other factors will be taken into consideration in the evaluation of proposals received. Award of this contract is subject to tenure and funding approval.

There is no mandatory site viewing but Proponents are strongly encouraged conduct their own site visit to familiarize themselves with the site conditions and access.

Definitions

The following terms will apply to all Proposals related to this Request for Proposal.

1.1. "Contract" means the written agreement resulting from this Request for Proposal, if any, in accordance with this Request for Proposal.

1.2. "Proponent" means the person submitting a proposal.

1.3. "Proposal" means a submission in response to this Request for Proposals.

1.4. "RFP" means this Request for Proposal.

1.5. "FMP" means the District of Mackenzie Fuel Management Prescription, Hwy 39 Egress Route Treatment.

1.6. "TU" means Treatment Unit.

1.7. "the District" means the District of Mackenzie.

1.8. "FSC" means Fire Smart Coordinator.

1.9. "MWAC" means Mackenzie Wildfire Advisory Committee.

1.10. "CWRP" means Community Wildfire Resiliency Plan.

1.11. "must", "shall" or "mandatory" means a requirement that must be met in order for the proposal to receive consideration.

1.12. "should" or "desirable" means a requirement having a significant degree of importance to the objective of the request for proposals, but which the District would strongly prefer to be fulfilled, and which the District may in its sole discretion elect to treat the failure to fulfill as a grounds for rejection of a Proposal.

Project Description

Purpose and Objectives

The purpose of this project is to carry out operational fuel treatment activities as prescribed in the FMP developed for the District of Mackenzie in TU #1 & 2. (see maps in ATTACHMENT 2). The successful proponent will be responsible for all aspects necessary to carry out all phases of the treatment as per the FMP, including but not limited to the following:

a. Cutting and removal of trees prescribed for removal.
b. Pruning of trees intended to be retained, bucking, chipping, and removal of debris.
c. Management of debris created during operations. Burning of debris must follow the FMP guidelines in the section "Debris Disposal-Burning and Smoke".
d. Ensuring prescription targets are met, a quality program must be implemented with plot data to be collected and provided to the FSC on an ongoing basis. A summary of the plot data collected to be submitted at project completion signed by a qualified Forest Professional.
e. Provide access to the TU sufficient to carry out treatment and removal of fibre generated from the treatment activities.
f. Take the necessary measures to comply with the guidelines for operating near highways, powerlines and pipelines.
g. Possibly require a Certified Utility Arborist present on site while working near powerlines.
h. Develop a traffic management plan for operating along Mackenzie Blvd. Control of vehicle (car, ATV, motor bike, etc) traffic in and around the vicinity of fuel treatment operations.

Where mechanical treatments are used Proponents will have to consider site conditions, types of equipment and possibly season of treatment to protect the root systems of retained stems and soil properties. To successfully achieve the targets for fuel reduction it is expected that areas of mechanical treatment will also have a component of manual treatment associated with them.

Invoicing & Payments

Invoices for each TU will be submitted as follows:

a. The Proponent may submit invoices for areas where treatments are complete. Where treatments require two or more phases, as in the case of winter mechanical treatment with a secondary debris removal treatment in snow free conditions, invoicing will reflect the pricing for the particular phase.
b. Prior to invoicing the Proponent and Fire Smart Coordinator will assess and agree upon the completed areas.
c. Invoices will be accompanied by a map detailing the location of the completed areas, indicating the relevant completed phases including Quality Plot Data.
d. Proposals will indicate the pricing breakdown for separate phases per Treatment Unit to facilitate payment. Rates and payment process will be confirmed between the Proponent and the WPC prior to any works commencing on a TU.
e. All payments are subject to a 20% holdback to be paid out upon satisfactory completion of all phases of work per Treatment Unit.
f. This work is funded by the Union of British Columbia Municipalities and all completed work is subject to technical review and approval by the funding agency.
g. Revenue from all fibre sales must be reported to the District for funding reasons.

Insurance Requirements

The successful proponent must supply the following information prior to commencement of the contract:

a. A copy of the current Corporate Safety Manual.
b. Verification that the company is registered and in good standing with WorkSafeBC.
c. A copy of the company Commercial General Liability Insurance providing for an inclusive limit of not less than five million dollars ($5,000,000) and must be willing to name the District of Mackenzie as an additional insured.
d. Proof of Fire Fighting Expense Endorsement to the Commercial General Liability Insurance providing coverage not less than five million dollars ($5,000,000.00).
e. during the fire season and coverage not less than five hundred thousand dollars ($500,000.00 outside fire season, after November 1 and before March 1).
f. A copy of Automobile Insurance providing third party liability coverage not less than two million dollars ($2,000,000.00) each occurrence, all-inclusive on owned, non-owned, or hired vehicles.
g. Proof of Safe Company Certification (BC Forest Safety Council).

Timeline

The following timeline is an estimate and may be adjusted at the District of Mackenzie' s discretion any time during this procurement process.

Distribution of RFP	**August 21, 2024**
Deadline for Questions Submitted by Email	**September 4, 2024**
RFP Submission Deadline	**September 11, 2024, 4pm**
Target Notification to Successful Proponent	**September 24, 2024**
Contract Completion Date	**November 30, 2024**

Proposals

a. The Proponent shall complete and submit the following documents with the Proposal submission:
   - Background information on Proponent including experience and qualifications in the industry, 3 references including contact information, and proof of SAFE Company certification.
   - Appendix A - Proponent Information and Agreement Form.
   - Detailed description of Proponent's Execution Plan including but not limited to operational methods, schedule, quality program, equipment to be used, fibre utilization plan, options to integrate local resources, measures to protect existing values.
   - Proposals will indicate the pricing separately for access and treatment.
   - Appendix B - Fixed Price Offer Plan.
   - Optional – Additional information relevant to the proposed methodology.

b. Prices must be quoted:
   - In Canadian dollars.
   - Inclusive of PST if applicable.
   - Goods and Services Tax (GST) should be shown as a separate line item.

Sub-Contracting

a. The Proponent should fully disclose all proposed subcontracting of any of the required services.

b. Using a sub-contractor is acceptable provided the Proponent remains the Prime Contractor. This includes a joint submission by two Proponents having no formal corporate links. However, in this case, one of these Proponents must be identified as the Prime Contractor and take overall

responsibility for successful completion of all phases of the project and this must be defined in the Proposal.

c. Sub-contracting to any firm or individual whose current or past corporate or other interests may, in the District's opinion give rise to a conflict of interest in connection with this project will not be permitted, and a Proposal may be rejected on this basis in the District's absolute and unfettered discretion. This includes, but is not limited to, any firm or individual involved in the preparation of this Request for Proposal.

Addenda & Questions

a. Proponents are advised that all subsequent information regarding this RFP, including any addenda, will be distributed on BCBid and on the District's webpage. Notification will not automatically be sent to all Proponents. It is the responsibility of all Proponents to check for addenda, which may be posted at any time up to closing time, prior to submitting their Proposal. All addenda should be acknowledged in the Proponent Information and Agreement Form.

b. To clarify any issues in this RFP, the District of Mackenzie will respond only to questions that are presented through e-mail. Questions should be submitted to the District's Fire Smart Coordinator **Micaiah Taylor** a mtaylor@districtofmackenzie.ca Telephone questions will not be accepted.

c. All questions must be received by **September 11, 2024, 4:00 pm.**

d. All questions and answers will be in a Q&A document which will be posted on BCBid and on the District of Mackenzie website at www.districtofmackenzie.ca with the RFP documents on or after September 4, 2024. This will be the only distribution method for the Q&A documents.

e. The District reserves the right to seek clarification from the Proponent regarding a proposal, to assist in making evaluations. The Proponent should submit a name and telephone number of a person the District may contact regarding any questions or clarifications relating to the Proponent's submission to the Request for Proposals.

Submitting Your Proposal

Submission & Deadline

a. Proposal submissions should be titled "**District of Mackenzie 2023 CRI Demonstration Project**" in the subject line.
b. Completed Proposals must be received by email to:

Micaiah Taylor **Email:** mtaylor@districtofmackenzie.ca
Fire Smart Coordinator

c. The deadline for receipt of complete Proposals is **4:00 pm Pacific Standard Time**, on **September 11, 2024**. Late Proposals will not be accepted and will be returned to the Proponent.

Proponent & District Responsibilities

a. It is the responsibility of Proponents to ensure compliance with all requirements and deadlines. It is the responsibility of Proponents to ensure delivery of all required response material. Proposals which are not in compliance with the RFP requirements may be rejected.

b. The District of Mackenzie assumes no responsibility for technological or logistical issues in delivering Proponent responses.

c. All costs of preparation and presentation associated with a response to this RFP will be the responsibility of the Proponent.

d. Proponents may be asked to make a presentation before the District if selected as a finalist.

e. The District reserves the right to enter into a contract with a Proponent for all, part, or none of the service or products that are the subject of this RFP.

f. Submission of a Proposal in response to this RFP indicates the Proponent's acceptance of the terms and conditions contained within the RFP.

g. Proponents who have obtained the RFP electronically must not alter any portion of the document, with the exception of adding the information requested. To do so will invalidate the Proposal.

Alternate Proposals & Changes to Proposal Wording

a. If an alternate solution is offered, the information should be submitted in a separate document.

b. The Proponent will not change the wording of their Proposal after closing and no words or comments will be added to the Proposal unless requested by the District of Mackenzie for purposes of clarification.

Conflict of Interest and Disclosure of Business Relationships

Any potential conflict of interest must be disclosed to the District. Proposals will not be evaluated if the Proponent's current or past corporate or other interests are, in the reasonable opinion of the District deemed or perceived to be a conflict of interest in connection with this RFP or the activities or mandate of the District.

a. All Proponents must make full disclosure of any of the following existing business relationships with any members of the District of Mackenzie Mayor and Council, District employees or immediate relatives of any members of the District's employees:

   - If a private company, details of ownership of shares by any of the above;
   - If a public company, details of ownership of shares, in excess of one percent (1%) to total shares by any of the above;
   - If a partnership, details of any partnership arrangement of any of the above;
   - Details of any direct or indirect pecuniary interest of any of the above in the supply of such goods and services.

b. Disclosure, if any, shall be made in writing at the time of submitting Proposals.

c. If the Proponent fails to disclose an interest and/or the interest is falsely or insufficiently reported, the District reserves the right to reject the Proposal in its absolute discretion.

Confidentiality

a. All Proponents and any other person who through this RFP process gains access to confidential financial information of the District are required to keep strictly confidential all information which in any way reveals confidential business, financial or investment details, programs, strategies or plans, learned through this RFP process. Information pertaining to the District obtained by the Proponent as a result of participation in this process is confidential and must not be disclosed without written authorization from the District.

b. The Proposal should clearly identify any information that is considered to be confidential or proprietary information (the "Confidential Information"). However, the District of Mackenzie is subject to the Freedom of Information and Protection of Privacy Act. As a result, while the Act offers some protection for third party business interests, the District of Mackenzie cannot guarantee that any Confidential Information provided to the District of Mackenzie can be held in confidence if a request for access is made under the Freedom of Information and Protection of Privacy Act.

Evaluating Proposals

a. Evaluation of Proposals will be by a Review Committee including the Fire Smart Coordinator, members of MWAC, and members of the District's Finance and Corporate Departments.

b. Awards will be based on the best value offered, and the best value will be determined by the District in its sole discretion. Evaluation criteria will be:

i. Proponent's offer, overall value, fixed price;
ii. Detail of execution plan demonstrating ability to meet specifications and schedule;
iii. Offer 3 References;
iv. Relevant Experience;
v. Potential for incorporating local resources, training and any value-added offerings;
vi. Fibre recovery plan.

TITLE	
EVALUATION CRITERIA	**WEIGHT**
Fixed Pricing	30
Execution Plan	20
References	10
Experience	10
Incorporating local resources	15
Fibre recovery plan	15

c. While previous experience with the District is not required and does not in any way confer an advantage, the District's previous experience with the Proponent may also be taken into consideration in its evaluation of Proposals. The District reserves the right to rely upon its records, references and recollection in this regard. The District may also obtain references other than those provided by the Proponent and may use these references in determining the best value.

d. By responding to this RFP, Proponents will be deemed to have agreed that the decision of the District will be final.

Communication with the District of Mackenzie

a. Only the Fire Smart Coordinator (or designate) is the District's representative authorized to communicate and otherwise deal with Proponents and all Proponents should communicate and otherwise deal with that person only. Contact with any other District representative, including Members of Council, officers or employees of the District regarding this RFP or a Proponent's submission may result in that Proposal being removed from consideration for this RFP. As stated above, all communication should be presented via email to the address stated above.

b. All Proponents who have submitted a Proposal will be notified of the Review Committee's decision after the final selection has been made. This notice of final selection may be the only communication between the District of Mackenzie and Proponents. Telephone or other inquiries concerning this Proposal after the Proposal deadline are discouraged.

Rejection & Acceptance of Proposals

No Obligation to Proceed

The District reserves the right to cancel this Request for Proposals at any time and for any reason, and will not be responsible for any loss, damage, cost or expense incurred or suffered by any Proponent as a result of that cancellation. The receipt by the District of any information (including any submissions, ideas, plans, drawings, models or other materials communicated or exhibited by any intended Proponent, or on its behalf) shall not impose any obligations on the District.

Acceptance and Rejection of Proposals

a. This Request for Proposal should not be construed as an agreement to purchase goods or services. The District is not bound to accept the lowest priced or any Proposal of those submitted. The District will be under no obligation to receive further information, whether written or oral, from any Proponent.

b. No act of the District, other than a notice in writing signed by the Chief Administrative Officer or the District's Director of Operations, shall constitute a Contract. Note that any acceptance may be subject to Council approval.

c. Neither acceptance of a Proposal nor execution of a Contract will constitute approval of any activity or development contemplated in any Proposal that requires any approval, permit or license pursuant to any federal, provincial, regional district or municipal statute, regulation or bylaw.

d. The District's intent is to enter into a Contract with the Proponent who has submitted the best offer. The District reserves the right to accept any or none of the proposals submitted and will evaluate proposals based on the best value offered to the District and not necessarily the lowest price, using the criteria specified in this RFP. The District reserves the right in its sole unrestricted discretion to:

- Accept any Proposal which the District deems most advantageous to itself;
- Reject any and/or all irregularities in a Proposal submitted;
- Waive any defect or deficiency in a Proposal whether or not that defect or deficiency materially affects the Proposal and accept that Proposal;
- Reject any and/or all Proposals for any reason, without discussion with the Proponent(s);
- Accept a Proposal which is not the lowest Proposal; and
- Cancel or reissue the RFP without any changes.

e. The District reserves the right to enter into negotiations with one or more Proponents concerning the terms and conditions of the services to be provided, and expressly reserves the right through such negotiations to request changes, alterations, additions or deletions from the terms of any Proposal received.

f. If the District chooses to enter into a contract with a Proponent as a result of this RFP, the successful Proponent will be required to enter into a written agreement with the District. Such agreement will be prepared by the District and will embody the terms of the Proposal and any subsequent written amendments.

Limitation of Damages and Insurance

The Proponent is responsible for ensuring that they have obtained and considered all information necessary to understand the requirements of the RFP and to prepare and submit their Proposal.

Proponents are solely responsible for their own expenses in preparing a Proposal and for subsequent negotiations with the District, if any.

Proponents acknowledge that the District, in the preparation of the Request for Proposals, supply of oral or written information to Proponents, review of Proposals or the carrying out of the District's responsibilities under this Request for Proposals, does not owe a duty of care to the Proponents.

Except as expressly and specifically permitted in this RFP, no Proponent shall have any claim for any compensation of any kind whatsoever as a result of participating in this RFP, and each Proponent, by submitting a Proposal, waives for itself, its successors and assigns, the right to sue

the District for any loss, including economic loss, damage, cost or expense arising from or connected with any error, omission or misrepresentation occurring in the preparation of the Request for Proposals, the supply of oral or written information to Proponents, the review of Proposals, or the carrying out of the District's responsibilities under this Request for Proposals, with the exception of fraud on the District's part.

Not A Tender

This Request for Proposal is not a tender call, and neither it nor the submission of any response to this RFP creates a tender process or a "Contract A".

Modification of Terms

The District reserves the right to modify the terms of the Request for Proposal at any time at its sole discretion.

Use of Request for Proposal

This document, or any portion thereof, may not be used for any purpose other than the submission of Proposals.

Accuracy of Information

The District of Mackenzie makes no representation or warranty, either express or implied, with respect to the accuracy or completeness of any information contained or referred to in this RFP.

While the District has used considerable efforts to ensure an accurate representation of information in this Request for Proposal, the information contained in this Request for Proposal is supplied solely as a guideline for Proponents. The information is not guaranteed or warranted to be accurate by the District, nor is it necessarily comprehensive or exhaustive. Nothing in this Request for Proposal is intended to relieve Proponents from forming their own opinions and conclusions with respect to the matters addressed in this Request for Proposal.

APPENDIX A

Proponent Information And Agreement Form

(must be completed and returned)

PROPONENT INFORMATION

Legal Business Name: _____

Address: _____

Contact Person: _____

Contact Information: _____
(phone / cell / fax / email)

Date of Site Viewing: _____

Name of Person(s) That Participated in Site Viewing: _____

PROPONENT AGREEMENT

The e*nclosed proposal is submitted in response to the above-referenced Request for Proposals, including any addenda. Through submission of this proposal we agree to all of the terms and conditions of the Request for Proposals and agree that any inconsistent provisions in our proposal will be as if not written and do not exist. We have carefully read and examined the Request for Proposals, including the Instructions to Proponents, and have conducted such other investigations as were prudent and reasonable in preparing the proposal. We agree to be bound by statements and representations made in our proposal.*

Signature of Authorized Representative: _____

Printed Name of Authorized Representative: _____

Title of Authorized Representative: _____

Date: _____

To acknowledge receipt of each addendum, each addendum number issued should be noted below with a signature of an authorized representative of the organization, as being received.

Addendum No. 1 Signature _____ Date _____

Addendum No. 2 Signature _____ Date _____

APPENDIX B

Fixed Price Offer Form

(must be completed and returned)

FTU	Net Area (ha)	Cost ($) Access	Cost ($) Treatment		Total Cost ($)
#1	**0.9**				$
#2	**2.8**				
Sub Total	**3.7**				
			GST	**5%**	$
			TOTAL		$

Note: Fixed prices are inclusive of all costs associated with completing the treatments to meet the objectives of the prescription.

ATTACHMENT 1

District of Mackenzie CRI 2023 Tree Crusher Demonstration Fuel Management Prescription

ATTACHMENT 2

Treatment Unit Maps for TU #1 & 2

A. PROJECT IDENTIFICATION	
PROJECT ID AND UNIT ID: District of Mackenzie CRI 2023 Tree Crusher Demonstration Fuel Management Prescription	LAND OR TENURE HOLDER: District of Mackenzie
LATITUDE/LONGITUDE: -123.093992°, 55.333503° N (approximate).	GEOGRAPHIC DESCRIPTION: The area is a forested patch within the town of Mackenzie near the site of the Tree Crusher, and lies between Mackenzie Blvd and Chrysdale Dr, and straddles Pioneer St.
HIGHER-LEVEL PLAN(s): • Community Wildfire Resiliency Plan (CWRP)– District of Mackenzie (2022) • Community Wildfire Protection Plan Update (CWPP)– District of Mackenzie (2017) • McLeod Lake Mackenzie Community Forest (K2M) Forest Stewardship Plan 2021-2026 • Mackenzie Land Resource Management Plan (2000) • Mackenzie Sustainable Resource Management Plan • Mackenzie Natural Resource District (MNRD) Integrated Silviculture Strategy – Situation Analysis (2015) • MNRD Fire Management Plan (2017) • Fire Management Stocking Standards Guidance Document (2016) • Wildfire Risk Reduction Tactical Plan for the Mackenzie Natural Resource District (2023)	MAP REFERENCE NUMBER: 93O.035

B. FUEL TREATMENT PROJECT DESCRIPTION			
OBJECTIVE:	☒ Public Safety	☐ Range Improvement	☐ Ecosystem Restoration
	☐ Recreation	☐ Wildlife Habitat	☒ Other:

	Description: According to BC Wildfire Service's Provincial Strategic Threat Analysis (PSTA) Fire Threat data, the majority of the proposed treatment area is classified as 'high' fire threat. Furthermore, the proposed area has a high priority for treatment due to its proximity to residences, community centres, and businesses, as per the 2022 CWRP, and for its desirability as a demonstration area. The objectives of this prescription are to: • Demonstrate the principles and practices of effective FireSmart fuel/vegetation management to local community members and the broader public through the use of permanent signage and community outreach; • Reduce the risk of wildfire ignition, spread, and spotting within forested areas adjacent to private land, residences and businesses, community gathering places, and critical infrastructure; • Reduce wildfire intensity and potential for crown fire around the town of Mackenzie; • Enhance public safety; • Accelerate forest succession to mature forest structural conditions with generally lower stand densities; • Enhance forest health and resilience to biotic and abiotic elements including mountain pine beetle, spruce beetle, western gall rust and windthrow; • Minimize negative impacts to, and where possible enhance, community values including recreation, cultural heritage, and visual quality; and • Minimize impacts to, and where possible, protect and enhance the availability/diversity of habitat and important ecosystem features.
STRATEGIES:	Strategies to achieve the above objectives include: • Thinning from below (i.e., remove suppressed, intermediate trees and select overstory trees) to reduce ladder fuels, crown bulk density, and ultimately reduce the risk of crown fire; • Retention of dominant and co-dominant canopy trees to a threshold that maintains a cool and moist understorey microclimate, where appropriate, while reducing wildfire behaviour intensity; • Pruning of retained trees to increase crown base height and reduce ladder fuel continuity; • Reduce fine surface fuel loading and flammable understorey vegetation to reduce surface fire intensity and rate of spread; • Retain and encourage live deciduous tree and shrub species with a high moisture content to reduce fire behaviour and provide wildlife habitat.
METHODS:	Thin from below (TFB), Hazard tree removal (HTR), Pruning (PR), Surface fuel removal (SFR), Chipping (CHIP) into bins, Grinding (GRIND) into bins, FIREWOOD.

C. FUEL TREATMENT UNIT (FTU) SUMMARY							
FTU	NET AREA (ha)	GROSS AREA (ha)	LEAVE AREAS (ha)	NP (ha)	NAR (ha)	TREATMENT REGIME (i.e. PRU, THIN, Rx BURN, etc.)	General Description
FTU-1	0.9	0.9	0.0	0.0	0.0	TFB, HTR, PR, SFR, CHIP, GRIND, FIREWOOD	This treatment unit is characterized as an untreated C-3 fuel type with an overstory dominated by Bl, with smaller portions of Sx, Ep, and At. Understory density is moderate for the most part composed primarily of At and Bl, with plots showing 3500 sph of Bl in the L3 and L4 layers. A thin from below, removal of most of the coniferous L2-L4 (only half of the Pl), hazard tree removal, pruning of retained trees, surface fuel removal and chipping or grinding for debris disposal is proposed. Firewood production for local residents is optional. All healthy deciduous trees will be retained, as well as healthy conifers over 12.5 cm dbh.
FTU-3	2.8	2.7	0.0	0.0	0.0	TFB, HTR, PR, SFR, CHIP, GRIND, FIREWOOD	This treatment unit is characterized as an M-1/2 fuel type that was treated or thinned in response to the Mountain Pine Beetle outbreak some 15-20 years ago. It has a Sx-dominated overstory and about a third of the basal area is occupied by deciduous, however there are significant canopy breaks. Understory density is moderate for the most part composed primarily of At and Bl, with some plots showing high levels of At in the L3 layer. A thin from below, removal of most of the coniferous L2-L4 (only half of the Pl), hazard tree removal, pruning of retained trees, surface fuel removal and chipping or grinding for debris disposal is proposed. Firewood production for local residents is optional. All healthy deciduous trees will be retained, as well as healthy conifers over 12.5 cm dbh.
TOTALS	3.7	3.6	0.0	0.0	0.0		

D. SITE CHARACTERISTICS							
FTU	CFFBPS FUEL TYPE	TIMBER TYPE	BGC SUBZONE, VARIANT & SITE ASSOC.	ELEVATION RANGE (m)	SLOPE POSITION	SLOPE RANGE (%)	ASPECT
FTU-1	C-3	PlAtEp(Sx)\747-20	SBS mk2 01	745-770	Lower	0-10%	SSW
FTU-2	M-1/2	PlAtEp(Sx)\747-20	SBS mk2 01	745-770	Lower	0-10%	SSW
FUEL TYPE DETERMINATION		C-3, M-1/2. Field observations, prism plots data collection, and line transects were completed to refine the fuel type from the Provincial Fuel Type layer. This was done to capture and describe the natural variation occurring at the site level.					
REPRESENTATIVE WEATHER STATION		Mackenzie Airport					

E. SOIL CHARACTERISTICS					
					SOIL HAZARD RATING

FTU	SOIL TEXTURE	DUFF DEPTH (cm)	COARSE FRAGMENTS (%)	SOIL DISTURBANCE LIMIT (%)	Compaction	Erosion	Displacement
FTU-1	L	10	20	10	High	Moderate	Low
FTU-2	L	10	10	10	High	Moderate	Low

F. VALUES – *FOREST AND RANGE PRACTICES ACT*

RIPARIAN & LAKESHORE AREAS - Forest Planning and Practices Regulation (FPPR) division 3, Government Action Regulation (GAR) section 6, Forest and Range Practices Act (FRPA) sections 180 and 181

Is the proposed burning, cutting, modification or removal of trees, or site preparation, in an area that contains streams, lakes or wetlands?	Yes ☐ No ☒	No streams or wetlands were observed in the area.

RIPARIAN MANAGEMENT AREAS (RMAs) - FPPR sections 51 and 52

STREAM, LAKE, WETLAND ID	CLASS	RRZ (m)	RMZ (m)	SPECIFICATIONS FOR RIPAIRAN OR LAKESHORE MANAGEMENT AREAS
N/A				

TEMPERATURE SENSITIVE STREAMS - FPPR section 53, GAR section 15, FRPA sections 180 and 181

Are there temperature sensitive streams or direct tributaries to temperature sensitive streams within or adjacent to the proposed treatment area?	Yes ☐ No ☒	No temperature sensitive streams were observed.

ROAD CONSTRUCTION IN RIPARIAN MANAGEMENT AREAS - FPPR section 50

Is road construction proposed in riparian management areas within the treatment area or an associated road permit (RP)?	Yes ☐ No ☒	No road construction is proposed.

STREAM CROSSINGS - FPPR section 55

Will stream crossings be constructed within the proposed treatment area or a road permit road providing access to the treatment area?	Yes ☐ No ☒	There are no streams to cross.

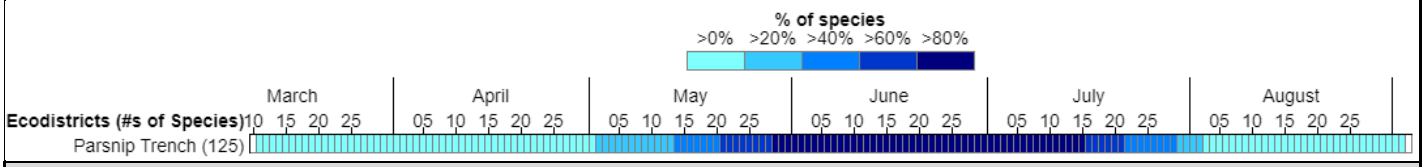
MAINTAINING STREAM BANK AND CHANNEL STABILITY ON S4, S5, and S6 STREAMS - FPPR section 52 (2)

Is the proposed treatment in the RMZ of an S4, S5 or S6 stream that is directly tributary to an S1, S2 or S3 stream and the activity is likely to contribute significantly to the destabilization of the stream bank or the stream channel?	Yes ☐ No ☒	There are no streams.
DOMESTIC WATER LICENCES (inside or outside of community watershed) - FPPR section 59		
Does the proposed treatment area contain water sources that are diverted for human consumption by a licensed waterworks?	Yes ☐ No ☒	There are no streams or water sources.
LICENCED WATER WORKS (inside or outside of a community watershed) - FPPR section 60		
Does the proposed treatment include areas that are within 100 m of a licensed waterworks?	Yes ☐ No ☒	There is no licensed waterworks within 100 m.
FISHERIES SENSITIVE WATERSHED - GAR section 14, FPPR section 8.1		
Are any activities proposed within a fisheries sensitive watershed?	Yes ☐ No ☒	No activities proposed within a fisheries sensitive watershed.
COMMUNITY WATERSHED - GAR section 8, FPPR section 8.2, 61, 62 and 84		
Does the proposed treatment area include areas that are within a community watershed?	Yes ☐ No ☒	The area is not in a community watershed.
Will this project require road or guard construction or deactivation within a community watershed?	Yes ☐ No ☒	The area is not in a community watershed.
WATERSHED ASSESSMENT CONSIDERATIONS - FRPA section 180 areas with "significant watershed sensitivity"		
Does the proposed treatment area include areas that have watershed assessment considerations?	Yes ☐ No ☒	There are no watershed assessment considerations.

SOIL DISTURBANCE AND PERMANENT ACCESS STRUCTURES - FPPR sections 35 and 36

Fuel Treatment Unit	Proposed Max. Allowable Soil Disturbance (%) (5% or 10%)	Proposed Max. Soil Disturbance for Roadside Work Areas (%)	Proposed Max. Permanent Access Structures (%)	Comments:
	5%	0%	0%	No access structures are proposed

Do the proposed Permanent Access Structures exceed 7% of the total area?	Yes ☐ No ☒	No access structures are proposed.
LANDSLIDES AND TERRAIN STABILITY - FPPR section 37		

Does the proposed treatment area include areas where terrain stability is a concern?	Yes ☐ No ☒	There are no terrain stability issues in the area.
SUITABLE SECONDARY STRUCTURE - FPPR section 43.1		
Does the proposed treatment area include a "targeted pine leading stand"?	Yes ☐ No ☒	The area does not have pine-leading stand with secondary structure created by MPB attack.
UNGULATE WINTER RANGE - GAR section 12, FRPA sections 180 and 181, FPPR section 69		
Does the proposed treatment area include areas within an Ungulate Winter Range?	Yes ☒ No ☐	The proposed treatment area is within the range/distribution of the central mountain caribou population. However, the treatment unit is within an urban area that is not used by caribou.
WILDLIFE HABITAT AREA - GAR section 10, FRPA sections 180 and 181, FPPR section 69		
Does the proposed treatment area include any wildlife habitat areas (WHA)?	Yes ☐ No ☒	The proposed treatment area does not include any wildlife habitat areas.
MIGRATORY BIRD CONVENTION ACT - 1994		
Does the proposed treatment have the potential to impact migratory bird habitat?	Yes ☒ No ☐	There is potential for the proposed treatment area to impact migratory bird habitat if such habitat is altered during the bird nesting season. A nesting calendar for the applicable Ecodistrict is in Figure 1 below. (Source: https://naturecounts.ca/apps/rnest/index.jsp). Every attempt must be made to avoid working during the nesting bird season. If treatment is to occur between May 2 to August 2, a qualified professional biologist must conduct a breeding bird survey prior to commencement of operations.
Figure 1 		
OBJECTIVES SET BY GOVERNMENT FOR WILDLIFE - FPPR section 7		
Does the proposed treatment area include areas to which objectives for wildlife under FPPR section 7 apply?	Yes ☒ No ☐	The proposed treatment area is within the range/distribution of the central mountain caribou population. However, the treatment unit is within an urban area that is not used by caribou.
OBJECTIVES SET BY GOVERNMENT FOR BIODIVERSITY OBJECTIVES (Landscape Level) - FPPR Part 4 Division 5		
Does the proposed treatment area include areas to which objectives for landscape level biodiversity under FPPR section 9 apply?	Yes ☐ No ☒	The proposed treatment area is within the Morfee Landscape Unit, established under the Mackenzie Land and Resource Management Plan (LRMP). The Morfee LU contains the following biodiversity assignment: • **Intermediate** Biodiversity Emphasis Option No legal or non-legal biodiversity objectives currently exist for the Morfee Landscape Unit. However, the proposed treatment will retain stand species and structural diversity, including considerations for wildlife trees and retention of coarse woody debris. **TU-1 and 2** are within the SBSmk2 BEC zone, with a Natural Disturbance Type regime of frequent stand-initiating events (NDT3). These ecosystems

		are characterized by frequent wildfires that range from small spot fires to conflagrations covering tens of thousands of hectares. This results in a landscape mosaic of stands of different ages with individual stands being largely even-aged. Average fire size ranges from 300 – 200,000 ha. For Sub-boreal Spruce and Boreal White and Black Spruce ecosystems with primarily coniferous components a mean return interval is approximately 125 years. Fire dominated ecosystems with prominent components of deciduous species have a mean return interval of 100 years.[1] The proposed treatment will maintain existing mature forest where it exists, targeting removal of understory stems while retaining veteran and large mature trees. This approach is consistent with the spatial and temporal pattern of small scale natural disturbance in SBSmk2.
OBJECTIVES SET BY GOVERNMENT FOR BIODIVERSITY OBJECTIVES (Stand Level) - FPPR Part 4 Division 5		
Are considerations for maintaining stand structure (wildlife trees, wildlife tree reserves, etc.), coarse woody debris, and maintaining tree and vegetation species composition incorporated into this prescription?	Yes ☒ No ☐	As part of this prescription, all dominant and co-dominant overstory trees will be retained, with the exception of danger trees that pose a risk to crew workers. Wildlife Danger Tree Assessments are required prior to implementation to identify and retain high value wildlife trees; where practicable. 'No work zone' areas will constitute no more than 5% of the entire net treatment, measured by TU. Recent blowdown events in the Mackenzie area have demonstrated that thinned Spruce-leading stands are especially vulnerable to post-treatment blowdown for all species within the stand, however this narrow stand of trees, isolated from other stands by cleared urban land, shows reasonable signs of wind-firmness. Prior to the recent Mountain Pine Beetle (MPB) outbreak, a small proportion of pine were present in the stand, therefore natural pine regeneration will be encouraged. Coarse woody debris will be retained as per Section H: Surface Fuel Loading. Larger diameter pieces (>25 cm) greater than 5m in length are preferred for retention. All deciduous trees and low flammability understory shrub and herb species will be retained within the treatment area.
RECREATION FEATURES - FRPA section 56 and 149, FPPR section 70		
Does the proposed treatment area contain interpretive sites, recreation trails, recreation sites, recreation facilities that are of significant recreation value and are designated a resource feature?	Yes ☐ No ☒	The treatment unit does not overlap with recreation features inventory polygons (iMapBC, Nov 2023). However, the area is adjacent to a municipal tourist attraction, the site of the Tree Crusher. The treatment itself is on municipal land and is intended as a demonstration of fuel treatment and is located next to the Tree Crusher to facilitate this. Precautions will be taken during the operational phase of this project to maintain the Tree Crusher site in its original condition.
VISUAL QUALITY OBJECTIVES - GAR section 7, FRPA sections 180 and 181, FPPR section 9.2		
Is the proposed treatment within a scenic area?	Yes ☐ No ☒	No visual quality objectives exist for the proposed treatment area.
ARCHAEOLOGICAL RESOURCES/CULTURAL HERITAGE RESOURCES - FPPR section 10		

[1] Hall, Erin; "Maintaining Fire in British Columbia's Ecosystems: an Ecological Perspective," 2010.

Are there any known archaeological sites or cultural heritage resources that are important to First Nations within the proposed area? No Referral to Land Manager is required if proposed TU is on the applicant's own First Nation Land.	Yes ☐ No ☒	A request for known archaeological/cultural sites was submitted to the MFLNRORD Archaeology Branch on November 30, 2023. The Archaeology Branch replied on November 30, 2023, stating that no known archaeological sites are recorded within any of the treatment areas, and there is no data available describing the potential for unidentified sites. If, during any phase of implementation, a believed archaeological site above or below surface is discovered**, all activities in the vicinity must stop immediately** and the contract supervisor must contact the Archaeology Branch for direction at 250-953-3334.
INVASIVE PLANTS - FRPA section 47 and FPPR section 17		
Is the introduction and spread of invasive plants likely as a result of the proposed treatment?	Yes ☒ No ☐	The Invasive Alien Plant Program (IAPP) database reports the following species have been identified in the vicinity of the treatment area, within the town of Mackenzie: • Hawkweed spp*. (HS),* • Oxeye Daisy *(OD),* • Orange Hawkweed *(OH),* • Common Tansy *(TC),* • Yellow Hawkweed *(YH).* The treatment unit is adjacent to disturbed areas, locations where invasive plants often thrive. Therefore, there is potential for further spread of established invasive species. The following best management practices shall be employed to reduce the introduction and spread of invasive plants to the treatment area: 1. Contractors shall be aware of potential invasive plants on site and be capable of accurate identification of these species (during flowering and non-flowering periods), as well as the most common B.C. invasive species. 2. Confirmed identifications should be reported to the Invasive Species Council of BC. This can be done through the Report Invasives or Report a Weed apps, online through the ISCBC, or by phoning 1-888-933-3722. 3. All machinery must be clean of soil and plant material before being transported to the site. 4. Avoid driving through or parking on weed infestations. Avoid areas of weed infestations for muster points, staging areas, or other gathering locations. 5. Carefully clean clothes, boots, hand tools, and other equipment used for treating invasive plants or working in or around an infested area before leaving a site. 6. Minimize soil disturbance, retain understory shrubs where practicable. 7. Areas of exposed mineral soil within 100 m of an infested site should be re-seeded with an appropriate seed mix of Canada Certified native species. The contract supervisor shall consult the local chapter of the Invasive Species Council of B.C. to request recommendations on a seed mix appropriate to the site / area, if necessary, to ensure that the most appropriate species mix is utilized.
NATURAL RANGE BARRIERS - FRPA section 48, FPPR section 18		
Are there natural range barriers within the proposed treatment area that are likely to be removed or rendered ineffective?	Yes ☐ No ☒	There are no natural range barriers within the proposed treatment area.

SPECIES AT RISK – FPPA section 7		
Are there species at risk present within the boundaries of the prescribed treatment area?	Yes ☐ No ☒	The proposed treatment area is within the range/distribution of the central mountain caribou population. However, the treatment unit is within an urban area that is not used by caribou. No other species at risk were identified during desktop review (CDC iMap, November 2023) or during field assessments.
LAND USE OBJECTIVES (Higher Level Plans and objectives set by Government under the *Land Act*)		
Are there land use objectives (higher level plans or objectives under the *Land Act*) that apply to the proposed treatment area or a Road Permit necessary to provide access to the treatment area?	Yes ☒ No ☐	The Mackenzie Land and Resource Management Plan (LRMP) provides direction for planning and natural resource management for the area of interest. The proposed treatment area overlaps the following land use polygons: • 'Mackenzie Townsite - Resource Management Zone #43'– Objectives regarding visual quality. No established visual quality objectives exist for the treatment areas. • The Morfee landscape unit, having a biodiversity emphasis option of intermediate.
Do the proposed activities conflict with land use objectives (higher level plans or objectives under the *Land Act*)?	Yes ☐ No ☒	Treatment activities proposed within this prescription do not conflict with legal requirements or non-legal guidance set out in the Mackenzie LRMP, including objectives for wildlife, biodiversity, visual quality, recreation, cultural resources, and water quality.
Known and potential species at risk, windthrow hazard, and old growth management areas	Yes ☒ No ☐	For species at risk, see Species At Risk section, above. Windthrow hazard was assessed as "Moderate" for FTU 1 and "Moderate" for FTU 2 on 13 Jun 2024. Moderate means that there may be tree failure due to windthrow, however a majority of the retained trees are expected to tolerate new wind forces. The site is narrow and is already significantly exposed to wind for the last 50+ years. No old growth management areas exist within the proposed treatment area.

G. OTHER CONSIDERATIONS AND REQUIREMENTS	
ENGAGEMENT AND CONSULTATION – FIRST NATIONS	
FIRST NATION	SUMMARY OF ENGAGEMENT, INFORMATION SHARING, CONCERNS IDENTIFIED AND MEASURES TO ADDRESS
MacLeod Lake Indian Band	A referral package was sent via email on November 27, 2023. No response has been received at the time of writing this document.
West Moberly First Nation	A referral package was sent via email on November 27, 2023. No response has been received at the time of writing this document.
Halfway River First Nation	A referral package was sent via email on November 27, 2023. No response has been received at the time of writing this document.
Doig River First Nation	A referral package was sent via email on November 27, 2023. A response was received on 19 Dec 2023 indicating that there were no concerns from the Doig River First Nation within this area.

First Nations consultation complete?	Yes ☒ No ☐	First Nation Consultation is ongoing, and any information received from involved parties prior to Final Draft Submission date will be incorporated into the prescription.

CONSULTATION – GENERAL
The proposed treatment area was chosen by the District of Mackenzie (DoM), see below. No other consultation requirements were identified by an iMapBC search on 30 Nov 2023. The DoM will notify adjacent residents of intended treatments and their timing.

EXISTING TENURE HOLDERS (Forest, Range, Guide Outfitters, Trappers, etc.)		
Tenure Holder	Concerns?	Measures proposed to address licensee's assets / concerns
Trapline Licence Holder Trapline Tag : TR0730T002	Yes ☐ No ☒	Trapline tenure holder contact information is not made available due to existing privacy laws. Therefore, we were unable to contact the trapline tenure holder.
No others were identified by iMapBC search on 30 Nov 2023.	Yes ☐ No ☒	n/a
PRIVATE PROPERTY		
Does private property border the proposed treatment area?	Yes ☒ No ☐	The proposed treatment area borders 28 private land parcels. The District of Mackenzie will be responsible for public engagement and information sharing/communication with all affected private property owners prior to commencing any treatment activities.
SMOKE MANAGEMENT		
Does a smoke management plan beyond OBSCR exist for the proposed treatment area?	Yes ☐ No ☒	A smoke management plan currently does not exist for the proposed treatment area. The treatment area is within a 'High' smoke sensitivity polygon. Therefore, if any burning is to occur all OBSCR regulations must be adhered to (see sections below). To avoid burning, chipping and off-site removal is the preferred method of debris disposal.
SAFETY		
Have any specific safety concerns been identified in or adjacent to the proposed treatment area?	Yes ☒ No ☐	The following are potential safety concerns: The unit is used by the public for hiking, dog-walking, and other non-motorized recreation. The contractor must have appropriate signage posted around the treatment unit to ensure that the public does not enter during times of active falling or other fuel treatment activities which may jeopardize public safety. Recent blowdown events in the Mackenzie area have demonstrated that thinned Spruce stands are especially vulnerable to post-treatment blowdown. The target area is narrow and adjacent stands were cleared and replaced by urban development 50+ years ago. This suggests the stand has had adequate time to grow in a wind-exposed environment and develop wind-firmness. Since the treatment is a low impact ("light touch") thin from below to 12.5 cm dbh, it is believed that it will not significantly impact the wind profile of the stand. The windfirmness of the stand was assessed as "moderate" and treatment will not appreciably increase the susceptibility of trees to wind failure. Thus despite the adjacency of private property, expert opinion (Ken Byrne, UBC) suggests that cleaning out the understory should not significantly alter the wind-profile of the stand. However danger trees should still be removed.

		Workers need to be aware of and mitigate risks from tree felling and overhead hazards. Due to the proximity of the tree-crusher tourist attraction and of private properties to this treatment area, a 6-month post-treatment hazard tree assessment must occur. Retained trees may be at higher risk of failure soon after treatment and they are within close proximity to buildings, utility lines, or other valuable targets. The assessor must be either a Tree Risk Assessment Qualification (TRAQ) assessor or an individual certified as a Danger Tree Assessor (Parks Module). The assessor may recommend creating wildlife trees (i.e., stub and limb) where trees represent high value to wildlife and will no longer remain hazardous to surrounding values (community centres) and to recreationalists.
UTILITIES & INFRASTRUCTURE		
Are utilities or infrastructure located in or adjacent to the proposed treatment area? i.e. power lines, rail lines, etc.	Yes ☒ No ☐	There is a power line greater than 20 m from the western side of the proposed treatment area.
ACCESS CONTROL		
Are there any foreseen issues with access and access control during and post treatment?	Yes ☒ No ☐	An Access Control Plan must be developed before operations commence. This is due to the close proximity of this treatment area to private land and residences as well as high recreational use within some of the treatment areas. The access control plan must be reviewed and signed off by the project supervisor. Details of the access control must be communicated to members of the public at least 30 days before operations commence. The project supervisor will coordinate with the contractor and district public works an access control plan. The area will be blocked off from public use and details will be shared via the radio and info packages at the Rec center front desk. The access control must address the protection of recreationalists or citizens that enter the treatment area during the following phases: active tree felling. During active tree felling, any trails must be blocked off with signage clearly indicating that the trail is closed. Trails may be reopened and the trail blocks removed when those hazards are no longer present. Overhead hazards, including danger trees must be made safe before recreationalists re-enter sections of the treatment area.
TRAFFIC CONTROL		
Is traffic control required at any point during operations?	Yes ☒ No ☐	It is possible that Pioneer Street may need to be closed if trees are felled within a tree length of the street. If that is the case, appropriate traffic control measures will be taken by the implementation contractor to close the relevant section of the street during falling activities.
OTHER (E.g Public Notification)		

Public Notification will be led by the District of Mackenzie and will commence 30 days before start of operations. This notification will include social media, websites and written notice in local media, as well as flyers for adjacent properties.

A permanent metal sign will also be installed near the Tree Crusher at project completion to inform the public about FireSmart principles and how the fuel management treatments that have taken place help mitigate the threat of wildfire.

H. FUEL LOADING AND TREATMENT SPECIFICATIONS (Complete H for each FTU)

Fuel Treatment Unit ID:

H.1 TREATMENT SPECIFICATIONS SUMMARY

FUEL REMOVAL/RETENTION STRATEGY BY SIZE/SPECIES

(Summarize specifications for surface, ladder and standing fuel removal and retention)

FTU-1:

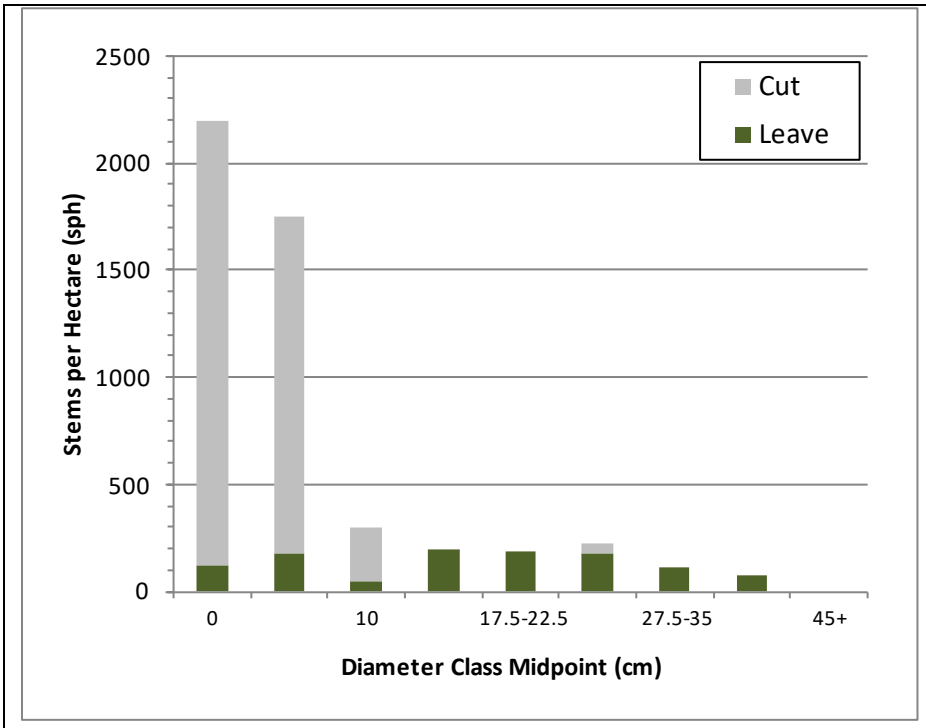
The main goal of the treatment will be to reduce wildfire intensity for this forested area, retaining both healthy large trees as well as high-value wildlife trees.

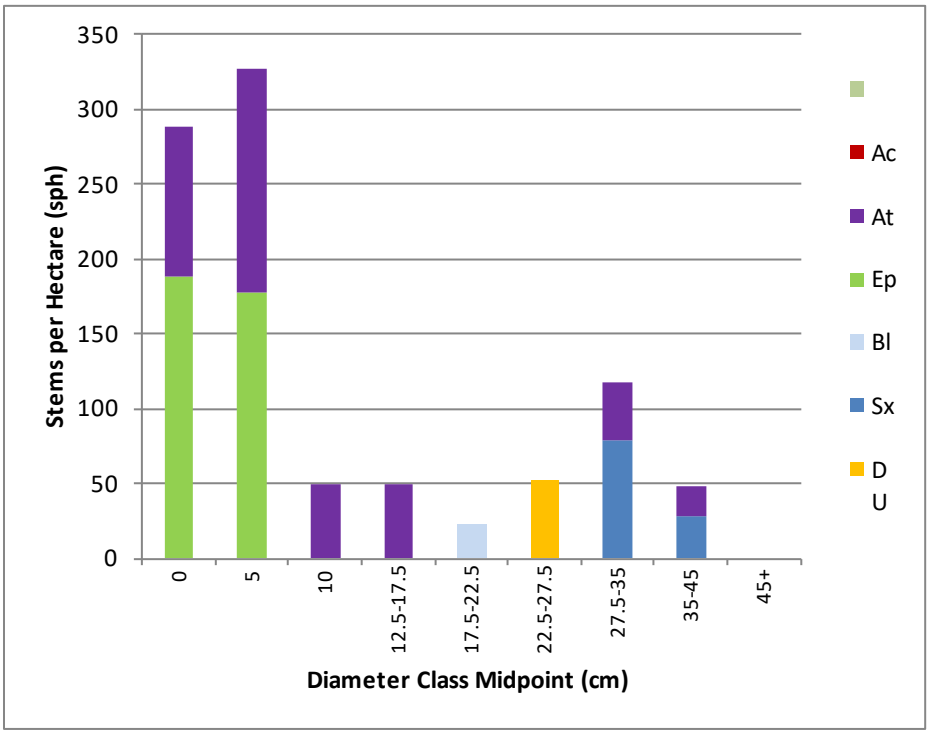
- Thin to specifications outlined in table, below (and in Appendix D), and remove dead standing trees in all size categories (except when designated high value wildlife trees).
- Thin conifer from below (i.e. L2, L3, L4) to reduce ladder fuels. Presence of deciduous in the crown should help to reduce the risk of crown fire. Retain target overstory density of 625 sph +/- 50 sph of conifer (750 sph including deciduous) greater than 12.5 cm dbh, plus all deciduous.
- Because of windthrow concerns and the presence of nearby residential property, the wind profile of the crown will not be disturbed, thus all overstory will be retained. This is a light-touch understory thin for demonstration purposes.
- Total average target density for all overstory and understory is 1,100 sph +/- 50 sph,
- Preference for conifer tree retention will be (in descending order): Fd (none noted), Pl, Bl, Sx.
- Remove understory Bl and Sx, up to 12.5 cm dbh (non-merch); retain overstory Bl and Sx > 12.5 cm dbh.
- Retain half of living Pl trees. Pl was a component of the stand before loss to MPB, and its return is encouraged.
- Retain all living Fd (none noted).
- Retain all living deciduous overstory and understory trees.
- Prune retained trees to 3 m CBH.
- Maximum stump height will be 10 cm and cut at an angle less than 10 degrees.

Please see complete stand, stock, and cut and leave tables in Appendix D.

Stand Table

Stand Layer	DBH Class	Species										Cutting Specs	Cut	Leave
		Ac	At	Bl	Ep	Pl	Sx	DU	DP					
L4	0		100	2050		50						94%	2075	125
L3	5		150	1550		50						90%	1575	175
L2	10		50	250								83%	250	50
L1	12.5-17.5		50	150								0%	0	200
	17.5-22.5			188								0%	0	188
	22.5-27.5			177				52				23%	52	177
	27.5-35		38				79					0%	0	117
	35-45		20		23		28					0%	0	71
	45+											0%	0	0
												Totals	3952	1103


2500
2000
1500
1000
500
0
Stems per Hectare (sph)
Cut
Leave
0
10
17.5-22.5
27.5-35
45+
Diameter Class Midpoint (cm)


350
300
250
200
150
100
50
0
Stems per Hectare (sph)
Ac
At
Ep
Bl
Sx
D
U
0
5
10
12.5-17.5
17.5-22.5
22.5-27.5
27.5-35
35-45
45+
Diameter Class Midpoint (cm)

Removal Percentages by Species

Stand Layer	DBH Class	Species At	%	Bl	%	Ep	%	Pl	%	Sx	%	DU	%		%	Overall Cutting	Cut	Leave	conifer cut	conifer leave
L4	0	100	0	2050	100	0	0	50	50	0	100	0	100	0		94%	2075	125	2075	25
L3	5	150	0	1550	100	0	0	50	50	0	100	0	100	0		90%	1575	175	1575	25
L2	10	50	0	250	100	0	0	0	50	0	100	0	100	0		83%	250	50	250	0
L1	12.5-17.5	50	0	150	0	0	0	0	0	0	0	0	100	0		0%	0	200	0	150
	17.5-22.5	0	0	188	0	0	0	0	0	0	0	0	100	0		0%	0	188	0	188
	22.5-27.5	0	0	177	0	0	0	0	0	0	0	52	100	0		23%	52	177	52	177
	27.5-35	38	0	0	0	0	0	0	0	79	0	0	100	0		0%	0	117	0	79
	35-45	20	0	0	0	23	0	0	0	28	0	0	100	0		0%	0	71	0	28
	45+	0	0	0	0	0	0	0	0	0	0	0	100	0		0%	0	0	0	0
		dec		con		dec		con		con		con		dec		Totals	3952	1103	3952	672

FTU-2:

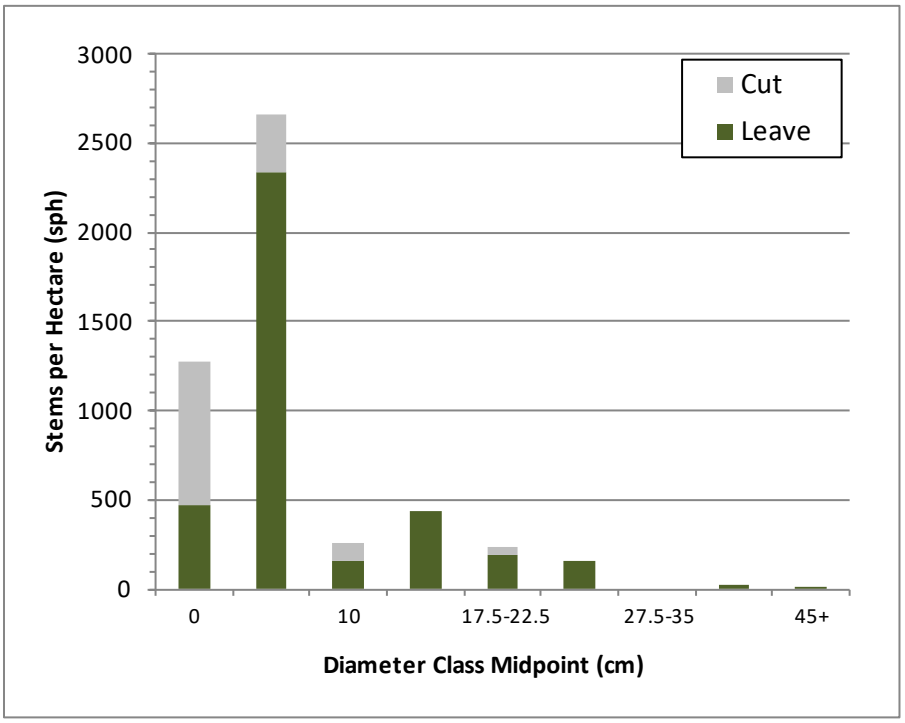
The main goal of the treatment will be to reduce wildfire intensity for this forested area, retaining both healthy large trees as well as high-value wildlife trees.

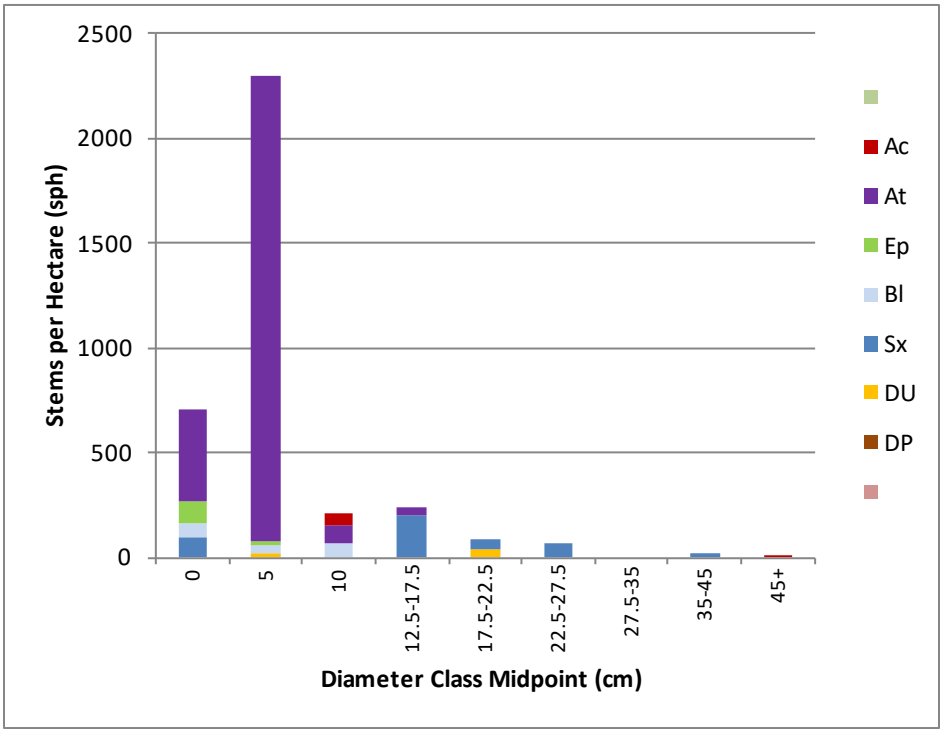
- Thin to specifications outlined in table, below (and in Appendix D) and remove dead standing trees in all size categories (except when designated high value wildlife trees).
- Thin conifer from below (i.e. L2, L3, L4) to reduce ladder fuels. Presence of deciduous in the crown should help to reduce the risk of crown fire. Retain target overstory density of 600 sph +/- 50 sph of conifer (800 sph including deciduous) greater than 12.5 cm dbh, plus all deciduous.
- Because of windthrow concerns and the presence of nearby residential property, the wind profile of the crown will not be disturbed, thus all overstory will be retained. This is a light-touch understory thin for demonstration purposes.
- Total average target density for conifer for all overstory and understory is 625 sph +/- 50 sph. **NB**, plot calculations show approximately 2740 sph of At in the understory. 2740 sph is not consistent throughout the TU – there are some dense patches of young At (captured in a couple plots – see pics). The goal is to retain 625 sph of conifer overstory and understory, and all deciduous, and in some areas there will be 3000+ sph of At to retain. These are expected to self-thin as the stand ages. Some deciduous understory may be removed incidentally to create operational space.
- Preference for conifer tree retention will be (in descending order): Fd (none noted), Pl, Bl, Sx.
- Remove understory Bl and Sx, up to 12.5 cm dbh (non-merch); retain overstory Bl and Sx > 12.5 cm dbh.
- Retain half of living Pl trees. Pl was a component of the stand before loss to MPB, and its return is encouraged.
- Retain all living Fd (none noted).
- Retain all living deciduous overstory and understory trees.
- Prune retained trees to 3 m CBH.
- Maximum stump height will be 10 cm and cut at an angle less than 10 degrees.

Please see complete stand, stock, and cut and leave tables in Appendix D.

Stand Table

Stand Layer	DBH Class	Species Ac	At	Bl	Ep	Pl	Sx	DU	DP			Cutting Specs	Cut	Leave
L4	0		440	680		60	100					63%	810	470
L3	5		2220	300	120			20				12%	320	2340
L2	10	60	80	100	20							38%	100	160
L1	12.5-17.5		40	140	60		200					0%	0	440
	17.5-22.5			107	39		50	39				17%	39	196
	22.5-27.5			21	73		67					0%	0	161
	27.5-35											0%	0	0
	35-45						19					0%	0	19
	45+	3										0%	0	3
												Totals	1269	3789


3000
2500
2000
1500
1000
500
0
Stems per Hectare (sph)
Cut
Leave
0
10
17.5-22.5
27.5-35
45+
Diameter Class Midpoint (cm)


2500
2000
1500
1000
500
0
Stems per Hectare (sph)
Ac
At
Ep
Bl
Sx
DU
DP
0
5
10
12.5-17.5
17.5-22.5
22.5-27.5
27.5-35
35-45
45+
Diameter Class Midpoint (cm)

Removal Percentages by Species

Stand Layer	DBH Class	Species Ac	%	At	%	Bl	%	Ep	%	Pl	%	Sx	%	DU	%	Overall Cutting	Cut	Leave	conifer cut	conifer leave
L4	0	0	0	440	0	680	100	0	0	60	50	100	100	0	100	63%	810	470	810	30
L3	5	0	0	2220	0	300	100	120	0	0	50	0	100	20	100	12%	320	2340	320	0
L2	10	60	0	80	0	100	100	20	0	0	50	0	100	0	100	38%	100	160	100	0
L1	12.5-17.5	0	0	40	0	140	0	60	0	0	0	200	0	0	100	0%	0	440	0	340
	17.5-22.5	0	0	0	0	107	0	39	0	0	0	50	0	39	100	17%	39	196	39	157
	22.5-27.5	0	0	0	0	21	0	73	0	0	0	67	0	0	100	0%	0	161	0	88
	27.5-35	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0%	0	0	0	0
	35-45	0	0	0	0	0	0	0	0	0	0	19	0	0	100	0%	0	19	0	19
	45+	3	0	0	0	0	0	0	0	0	0	0	0	0	100	0%	0	3	0	0
		dec		dec		con		dec		con		con		con		Totals	1269	3789	1269	634

TREATMENT SPECIFICATION RATIONALE

Recent blowdown events in fuel-treatment stands along Highway 39 in the Mackenzie area have demonstrated that thinned Sx stands are especially vulnerable to post-treatment blowdown. Some of these blowdown events occurred in fuel-treatment stands with fairly light understory thinning, but resulted in the loss of all overstory Sx. Consequently, because of windthrow concerns and the presence of nearby residential property, the wind profile of the crown will be left as undisturbed as possible, thus all overstory will be retained. This is a light-touch understory thin for demonstration purposes.

Prior to the MPB outbreak, Pl existed in the FTUs. Therefore, L2, L3 and L4 Pl will be retained to bolster its return to the site. These are a very minor component of each TU, and retention is not expected to impact post-treatment wildfire behaviour in the short-term.

This prescription specifies treatment activities that will result in a reduction in stand stem density, surface fuel loading, ladder fuels, and vertical and horizontal fuel continuity. A critical wildfire behaviour parameter to control is wildfire intensity as it directly relates to difficulty of firefighting and potential for negative impacts to structures and to human life and safety. Furthermore, wildfire intensity is generally correlated with post-fire severity. This correlation includes higher intensity correlating with higher tree mortality, higher duff consumption and underground ecosystem impacts, as well as longer term impacts to a forested ecosystem such as soil erosion and negative changes to hydrologic functioning. Therefore, reducing potential wildfire intensity will improve the long term ecological resilience of the forest.

Fuel management in these treatment units will reduce fire intensity to an extent that will limit crown fire behaviour, reduce the rate of spread, and meet overall objectives for public safety and wildfire risk reduction within the WUI. Strategies to achieve this include removal of many understory conifer stems. This includes prioritization of retention of Fd and Pl. Additional pruning of retained trees and surface fuel removal will further reduce available fuels contributing to ignition potential and spread rate.

Fire Behaviour Modeling

The tables below represent the predicted changes in wildfire intensity and behaviour pre- and post-treatment. See *Appendix C: Fire Behaviour Outputs* for further details on fire behaviour modelling results, additional methodology descriptions, and data inputs used for predictions.

Standing and surface fuel removal targets were determined with the goal of producing a maximum predicted fire intensity of < 2,000 kW/m for stands with overstory retention. Predicted pre- and post-fire behaviour was modelled and compared using multiple programs including FuelCalc, CFIS, Critical Surface Intensity Worksheet, Canadian Conifer Pyrometrics, and the FBP Red Book. Inputs into these models include 90th percentile weather conditions from local weather stations, crown bulk density (kg/m^3) (FuelCalc), crown base height (m), and surface fuel loading (kg/m^2). Pre- and post-treatment results predict the following fire behavior reductions below:

FTU-1

Factor	Pre-Treatment	Post-Treatment
Fire Type	Active Crown Fire	Surface Fire

Likelihood of Crown Fire (%)	85	46
Rate of Spread (m/min)	21.7	8.8
Critical Surface Fire Intensity (kW/m)	23	720
Wildfire Intensity (kW/m)	9,363	461

FTU-2

Factor	**Pre-Treatment**	**Post-Treatment**
Fire Type	Passive Crown Fire	Surface Fire
Likelihood of Crown Fire (%)	68	28
Rate of Spread (m/min)	7.0	9.0
Critical Surface Fire Intensity (kW/m)	66	720
Wildfire Intensity (kW/m)	2,872	968

H.2 STAND FUEL LOADING

Complete a STAND and STOCK TABLE (SST) appendix for each FTU. The SST(s) must be attached to this document. A professional volume estimate is required when merchantable tree cutting is prescribed and a timber cruise should be considered when cutting >50 m^3/ha or >500 m^3 in total.

Is the cutting of standing trees prescribed?

☒ Yes

☐ No

Comments: Please see stand and stock table in Appendix D

FTU-1 (0.9 ha):

Approximately 3,952 stems per hectare (sph) are scheduled for removal of which 99% are below merchantable specification. The larger stems to be cut will consist of only Dead Useless or danger trees and are expected to comprise 10 m^3/ha of merch-sized timber (total 9 m^3) of which **0 m^3/ha will be merchantable** (all dead-useless). These will be chipped or bucked (to carryable size) on site due to logistical difficulties with log removal, including: difficulty in using full-size logging equipment on-site and risk of damage to nearby private residences during timber extraction. Overcoming these difficulties is non-economic for such a small volume.

STAND AND STOCK TABLE SUMMARY (copied from Stand and Stock Tables in Appendix)

Layer Info	Crown Base Height Range (m)	Age / Average Tree Height (m)	STEMS PER HECTARE (sph)			VOLUME PER HECTARE (m^3/ha)[2]		
			Existing	Cut	Leave	Existing	Cut	Leave
Total All Species Layer 1	0.0	13.3	805	52	753	202	10	192
Total All Species Layer 2	0.0	6.2	300	250	50	0	0	0
Total All Species Layer 3	0.0	3.3	1750	1575	175	0	0	0
Total All Species Layer 4	0.0	1.0	2200	2075	125	0	0	0
TOTAL ALL LAYERS (from Stand and Stock Table appendix)	0.0	4.1	5055	3952	1103	202	10	192

FTU-2 (2.7 ha):

Approximately 1,269 sph are scheduled for removal of which 97% are below merchantable specification. The larger stems to be cut will consist of only Dead Useless or danger trees and are expected to comprise 1 m^3/ha of merch-sized timber (total 2.7 m^3) of which **0 m^3/ha will be merchantable** (all dead-useless). These will be chipped or bucked (to carryable size) on site due to logistical difficulties with log removal, including: difficulty in using full-size logging equipment on-site and risk of damage to nearby private residences during timber extraction. Overcoming these difficulties is non-economic for such a small volume.

STAND AND STOCK TABLE SUMMARY (copied from Stand and Stock Tables in Appendix)

Layer Info	Crown Base Height Range (m)	Age / Average Tree Height (m)	STEMS PER HECTARE (sph)			VOLUME PER HECTARE (m^3/ha)[3]		
			Existing	Cut	Leave	Existing	Cut	Leave
Total All Species Layer 1	0.0	12.6	857	39	818	129	1	128
Total All Species Layer 2	0.0	6.8	260	100	160	0	0	0
Total All Species Layer 3	0.0	2.0	2660	320	2340	0	0	0
Total All Species Layer 4	0.0	0.3	1280	810	470	0	0	0
TOTAL ALL LAYERS (from Stand and Stock Table appendix)	0.0	3.6	5057	1269	3788	129	1	128

H.3 SURFACE FUEL LOADING (kg/m2)

Size Class (cm)	Existing (kg/m^2)	Existing Distribution	Target (kg/m^2)	Target Distribution	Methodology Used
Fine Woody Debris (</=7cm)	0.31	Discontinuous and scattered	0.31	Discontinuous and scattered	USFS photoload, Brown's transect
Large Diameter Woody Debris (>7cm – </= 20cm)	1.59	Discontinuous and scattered	1.59	Discontinuous and scattered	USFS photoload, Brown's transect
**Coarse Woody Debris (CWD) (20cm+)	(1 piece/ha) 0.06	Discontinuous and scattered, (piece defined as 10 m length)	(2 piece/ha) 0.12	Discontinuous and scattered, buck to ground, (piece defined as 10 m length)	5.64 m fixed radius plot, Browns transect

H.4 CROWN CLOSURE AND CANOPY BULK DENSITY

Crown Closure (%)	Existing: (Dead / Live) 20% This number driven down by a couple plots that landed in quite open eras.	Target: 20%
Canopy Bulk Density (description including fuel stratum gap)	Existing: (Dead / Live): TU1: 0.31 TU2: 0.14	Target: TU1: 0.12 TU2: 0.12

H.5 BIODIVERSITY AND FOREST HEALTH CONSIDERATIONS AND TARGETS

**COARSE WOODY DEBRIS (CWD) RETENTION TARGET - Pieces / ha and Distribution	4 pieces, scattered and discontinuous A 'piece' is defined as 10-meter in length, and therefore a long log may be counted as multiple 'pieces.' There is a preference to retain larger pieces (> 30 cm diameter). Ensure CWD is scattered throughout the area and bucked to the ground and limbed. CWD in decay class 4 or above is not counted towards the CWD target.
WILDLIFE TREE RETENTION TARGET – describe specific wildlife tree features to protect, sph, geographic preferences etc.	Retention of high-value wildlife trees will occur where operationally feasible and safe to do so. Wildlife Danger Tree Assessments conducted by a certified WDTA are required prior to implementation to identify and retain high-value wildlife trees where practicable. 'No work zone' area will constitute no more than 5% of the entire net treatment, measured by TU. In consultation with a WorkSafeBC (WCB) Inspector, treatment specifications may be reduced to activities that constitute LOD 1 to allow for modified treatment in the vicinity of large diameter LOD 2 danger trees which are characterized as high-value wildlife trees. The resulting specifications for modified LOD 1 treatment must be confirmed with a WCB inspector, but may include: limbing, pruning trees <20 cm dbh, use of in-helmet radio communication; and/or moving debris manually.
FOREST HEALTH- Should include details such as agent, affected species, incidence rating, mortality, and targets	No significant forest health issues were observed in either treatment unit.

** CWD – See "Surface Fuel Loading" section of the guidance document to ensure both CWD objectives are met post treatment.

I. TREATMENT DESCRIPTION (Must Be Filled Out)
MERCHANTABLE TIMBER CUTTING
ROADS, LANDINGS AND TRAILS (e.g., will new road construction be required, is there existing roads that will be utilized?): No roads, landings, or trails will be required.
FELLING (e.g., is there special measures required for felling, hand falling areas, etc.): No special measures for felling required. Hand falling is prescribed. All fallers must only fall trees up to the maximum size they are certified to fall to. Stump height will be no greater than 10 cm and cut at an angle less than 10 degrees.
YARDING/SKIDDING (e.g., is there specific yarding areas identified, is forwarding preferred over skidding due to sensitive soils in some areas etc.): No yarding or skidding is anticipated. Felled trees to be bucked on site and chipped.
PROCESSING, LOADING AND HAULING (e.g., are there specific areas identified regarding where these activities may occur?): There are many access points to the site: a grassy boulevard along its west side, as well as boulevards at the north and south end of each FTU where work pickups or a chipper may be parked. Log processing, loading, and hauling is not anticipated. Debris to be chipped on site and then hauled out.

SLASH DISPOSAL (e.g., is there a recommended slash disposal method?):

Slash and debris are to be bucked to carryable size then removed, or chipped on site and then removed. If appropriate some logs may be cut to firewood for public pick up. Additionally, the contractor may remove wood waste (non-merchantable timber, branches, etc.) or chips/mulch via large bin or container. If this is proposed, the site supervisor and contractor will agree on location(s) for the bin or container roadside in order to facilitate the safe and efficient transport of the wood waste.

SPECIAL MEASURES:

Minimal site/soil disturbance is anticipated with proposed manual harvesting. Any soil disturbance/displacement identified must be rehabilitated as soon as possible. During treatment activities and debris hauling, contractor will:

- Minimize soil disturbance and forest floor displacement,
- Should an unacceptable level of soil disturbance occur on trails or within the treatment area, the contract supervisor will develop an appropriate rehabilitation plan,
- Established trails will be maintained in or restored to pre-treatment condition, or as specified by the contract supervisor,
- Deactivation and rehabilitation are site specific and can involve any combination of the following approaches:
    1. Removal and/or redistribution of woody materials as necessary to limit the concentration of subsurface moisture in the area;
    2. Decompaction of compacted soils, where possible;
    3. Returning displaced surface soils and berm materials; and/or
    4. Revegetation of exposed mineral soils.

STAND MODIFICATION TREATMENTS

BRUSHING:

Brushing is not anticipated but thinning is.

PRUNING:

Prune branches of all retained trees to a **minimum height of 3 m**, or to a height that retains 40% of the total tree height as live crown, whichever is lower in height. The 3 m is measured from the ground to the lowest point on the branch (often the branch tip) and may necessitate pruning to 3.5 m up the bole to be acceptable and achieve targets. Target branches that contain fine fuels ie. twigs, needles; do not prune existing branch stubs. Pruning cuts should be flush with the stem without cutting into the branch collar or scarring the bole. Branch stubs shall be less than 1 cm long.

THINNING:

Existing stand condition and target retention densities for both FTUs are described in detail in *Section H* above. The majority of stems removed are below 17.5 cm dbh. These smaller stems are the predominant components of ladder fuels.

DEBRIS PILING:

Under the Wildfire Act and Regulation logging and manual debris piles can be constructed either through mechanical or manual methods and all piles must be disposed of following the below guidelines. All burning is to be conducted in compliance with the BC Wildfire Act and Wildfire Regulation and follow the BCWS 'Pile Construction and Burning Guidance (2023)[4]

Habitat Piles: Create up to 2 habitat piles per hectare. Habitat piles should be constructed of small trees, limbs, and boughs, with the largest materials on the bottom and finest materials on the top. Habitat piles must be a minimum of 1m x 1m x 1m tall. Habitat piles must not exceed 2m x 2m x 1m tall in size.

Roadside debris piling may be employed as necessary to facilitate chipping or grinding.

No Category 3 piles will be built within this treatment area[5].

PILE BURNING:

No pile burning is prescribed.

[4] https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/fuels-management/wrrpileconstructionandburningguidance_final_2023_june_06.pdf

[5] https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/bc-timber-sales/ems-sfm-certification/business-area/kamloops/tka-bcws-cat3-open-fire-bulletin.pdf

CHIPPING/MULCHING: Chipping should be employed where operationally feasible. It is anticipated that chips will be hauled off site to an appropriate disposal facility.
MASTICATION: N/A
GRINDING: Could replace chipping.
PRESCRIBED FIRE: N/A
PLANTING: N/A
OTHER: FIREWOOD: There is potential for firewood production for community members, between 1 to 5 cords. Firewood may be piled at publicly accessible locations designated by the contract supervisor. Firewood pieces should be no more than 1.5 m in length. Since making firewood will add cost to treatments it needs to be done with community input and as required.
AUTHORIZATION AND TIMBER TENURE REQUIREMENTS (To be populated in consultation with the land manager. E.g., BC Parks, Natural Resource District, Mountain Resorts Branch etc.)
FRPA Section 52: N/A
Forestry License to Cut (FLTC): An FLTC for the purpose of community wildfire protection (*LTC Regulation Section 1*)[6] is required. It is anticipated that the FLTC will be direct award given the total volume removal is <2,000 m^3. A discussion with the District to determine proper authorization is necessary prior to commencing operations.
Park Use Permit: N/A
Road Permit or Road Use Permit: N/A
Other (i.e., local government, utilities, etc.): N/A

J. POST TREATMENT
EXPECTED VEGETATION RESPONSE BY FTU: FTU-1: SBS mk2 – This site has not been previously treated. Tree removal focuses on understory conifers. Since the treatment intends not to disturb the wind-profile of the canopy, there should be little light impact to surface vegetation. However, given the results of previous treatments in neighbouring FTU-2, this may increase growth of shade tolerant species like Bl. The previous FTU-2 treatment removed more of the canopy (some of it due to MPB) so the vegetative response of deciduous shrubs and trees is not likely to be as strong in FTU-1 (as it was previously in FTU-2) and is expected to be **Low**. Regeneration of conifers Bl, Sx, Pl in the understory is expected to be **Low,** and regeneration of At is expected to be **Low**. Regeneration of deciduous shrubs are likely to include Red Osier Dogwood, Willow, Black Gooseberry, and Rose. FTU-2: SBS mk2 – This site has been previously treated which included removal of MPB-affected trees. The southern portion of the FTU has a noticeably more open canopy than the northern bulb and has seen greater influx of young At. Like FTU-1, tree removal focuses on understory conifers. The previous treatment removed a higher percentage of the canopy (some of it due to MPB)

[6] https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/221_2006

than the proposed one so the vegetative response of deciduous shrubs and trees is not likely to be as strong this time around and is expected to be **Low**. Regeneration of conifers Bl, Sx, Pl in the understory is expected to be **Low,** and regeneration of At is expected to be **Low**. Regeneration of deciduous shrubs are likely to include Red Osier Dogwood, Willow, Black Gooseberry, and Rose.

ADDITIONAL MONITORING AND MAINTENANCE:

Planned / Scheduled Monitoring & Maintenance:

Time Post Treatment (months / years)	Activity / Treatment:	FTU(s):	Comments:
5-10 yrs	Wildfire Hazard Assessment	FTU-1 and FTU-2	The treatment itself is anticipated to limit the wildfire hazard for 15 – 20 years but hazard assessments should be conducted sooner. It is recommended that a qualified professional complete a wildfire hazard assessment in 5-10 years (or after a natural disturbance or change to a major forest health factor) post-treatment to assist in scheduling and prioritization of maintenance activities. Maintenance activities may include additional thinning, brushing, or surface fuel loading reduction.
Similar intervals thereafter			

Triggers For Maintenance Treatments:
Wildfire Hazard Assessment indicates it, or after a natural disturbance or change to a major forest health factor. Wildfire Threat Assessments are recommended after a natural disturbance that alters forest composition.

SILVICULTURE OBLIGATIONS: Do silvicultural obligations apply to the treatment area? Yes ☐ No **X**

PLANTING: Is planting a treatment identified in this prescription or required as a legislative obligation? Yes ☐ No **X**

STOCKING STANDARDS

FTU	Stocking Standard ID	Pref. Spp.	Acc. Spp.	Well-Spaced Stem/ha				Minimum Height (m)			Regen Delay	Free Growing (years)
				TSS	MSS		MITD	Pl	Others	RTH (%)		
					Pref. & Acc.	Pref.						
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

K. Outstanding Works

- Acquisition of FLTC.
- Public notification of specific operations to occur at minimum 30 days before commencement of work. It is the responsibility of RMOW to implement public notification.
- First Nation Consultation is ongoing, and any information received from involved parties prior to Final Draft Submission date will be incorporated into the prescription.
- If this FMP is implemented during breeding bird season (Apr 4 -Jul 31; See Migratory Bird Convention Act Section for more information), a breeding bird survey must be conducted prior to treatment by a qualified professional.
- Safety and Access plans will be developed and shared with all relevant parties before works commence.

L. ADMINISTRATION

PREPARATION

Charles Friesen, RPF	

QUALIFIED REGISTERED PROFESSIONAL NAME *(Printed)*	QUALIFIED REGISTERED PROFESSIONAL SIGNATURE
Charles Friesen, RPF	
PROFESSIONAL ASSOCIATION & MEMBER NUMBER	DATE
FPBC, #3838	31 July 2024

M. ATTACHMENTS

MAPS:	Yes **X** No ☐	FIELD DATA CARDS:	Yes ☐ No **X** ☐
WUI WTA Plots and Photos:	Yes **X** ☐ No ☐	CRUISE DATA:	Yes ☐ No **X** ☐
AIR PHOTOS/IMAGERY:	Yes **X** ☐ No ☐	BURN PLAN:	Yes ☐ No **X** ☐
MODELING/DATA ANALYSIS:	Yes **X** ☐ No ☐	STAND & STOCK TABLES:	Yes **X** ☐ No ☐
SURFACE FUEL LOADING DATA:	Yes ☐ No **X** ☐	OTHER:	
TERRAIN STABILITY ASSESSMENT Completed By: Date:	Yes ☐ No **X** ☐	VISUAL IMPACT ASSESSMENT Completed By: Date:	Yes ☐ No **X** ☐
ARCHAEOLOGY IMPACT ASSESSMENT Completed By: Date:	Yes ☐ No **X** ☐	BIOLOGIST ASSESSMENT Completed By: Date:	Yes ☐ No **X** ☐

ADDITIONAL COMMENTS:

Appendix A: Maps

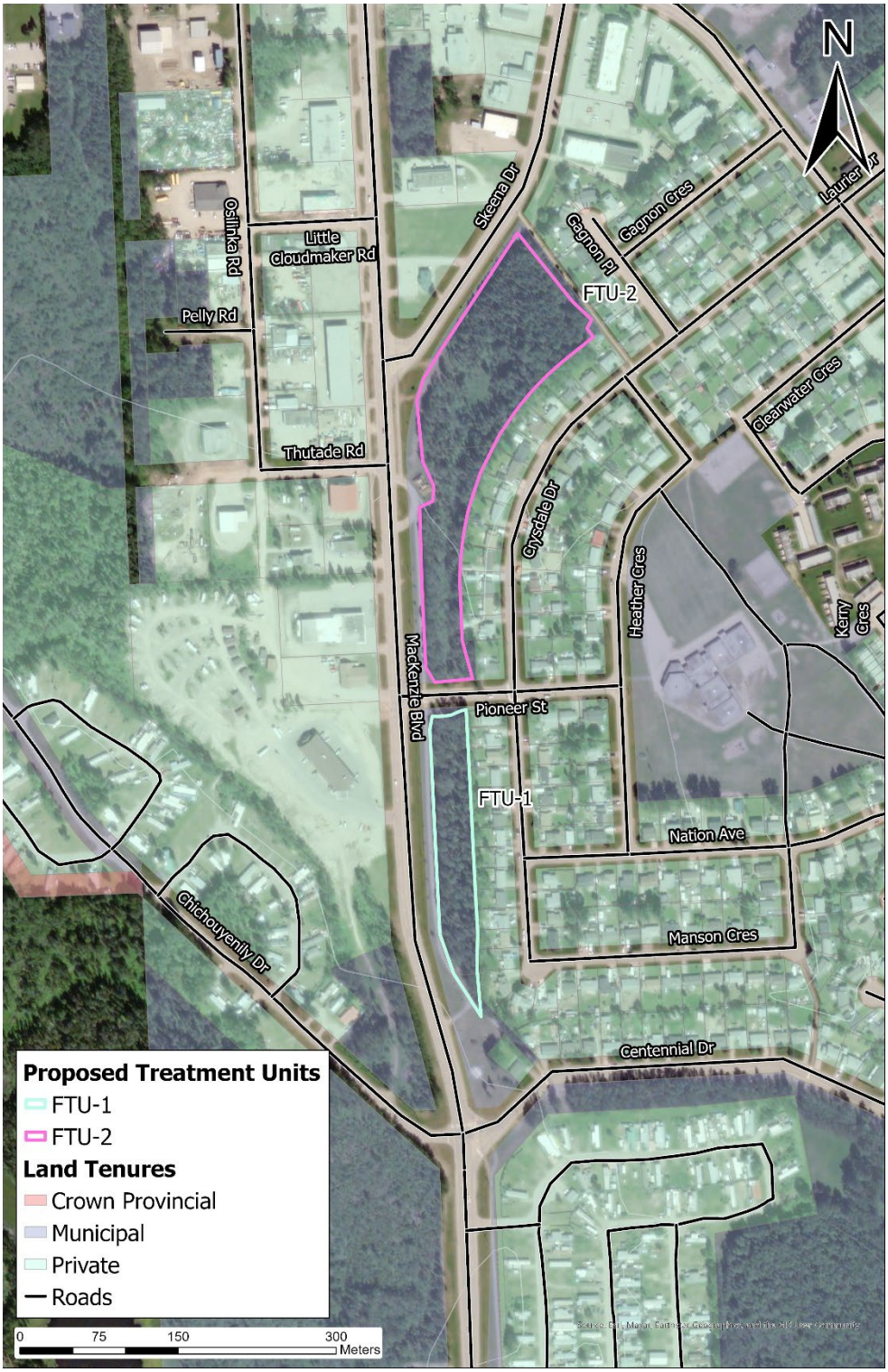


Figure 1: District of Mackenzie Tree Crusher Demonstration FMP Overview Map.

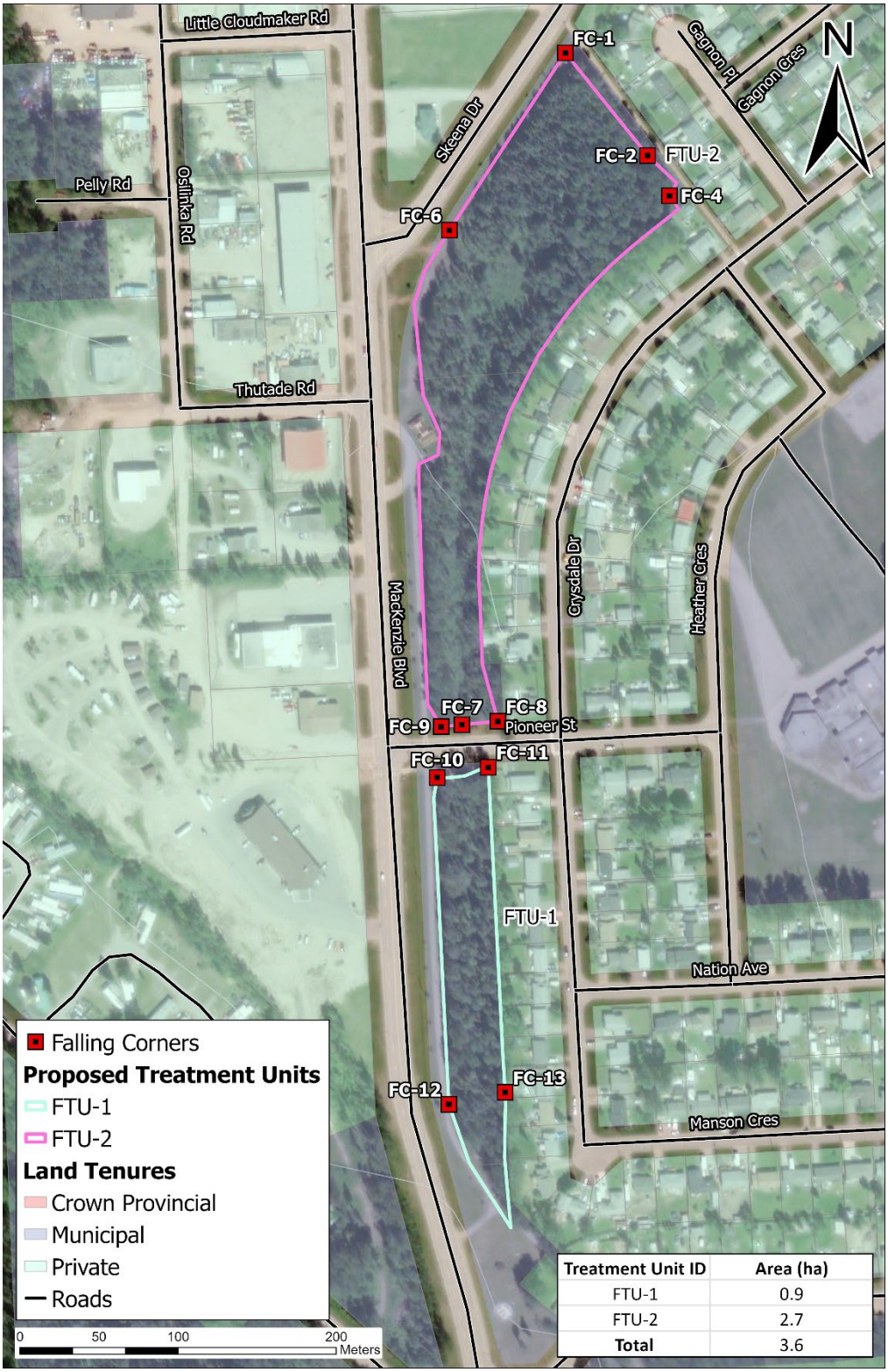


Figure 2: District of Mackenzie Tree Crusher Demonstration FMP Operations Map.

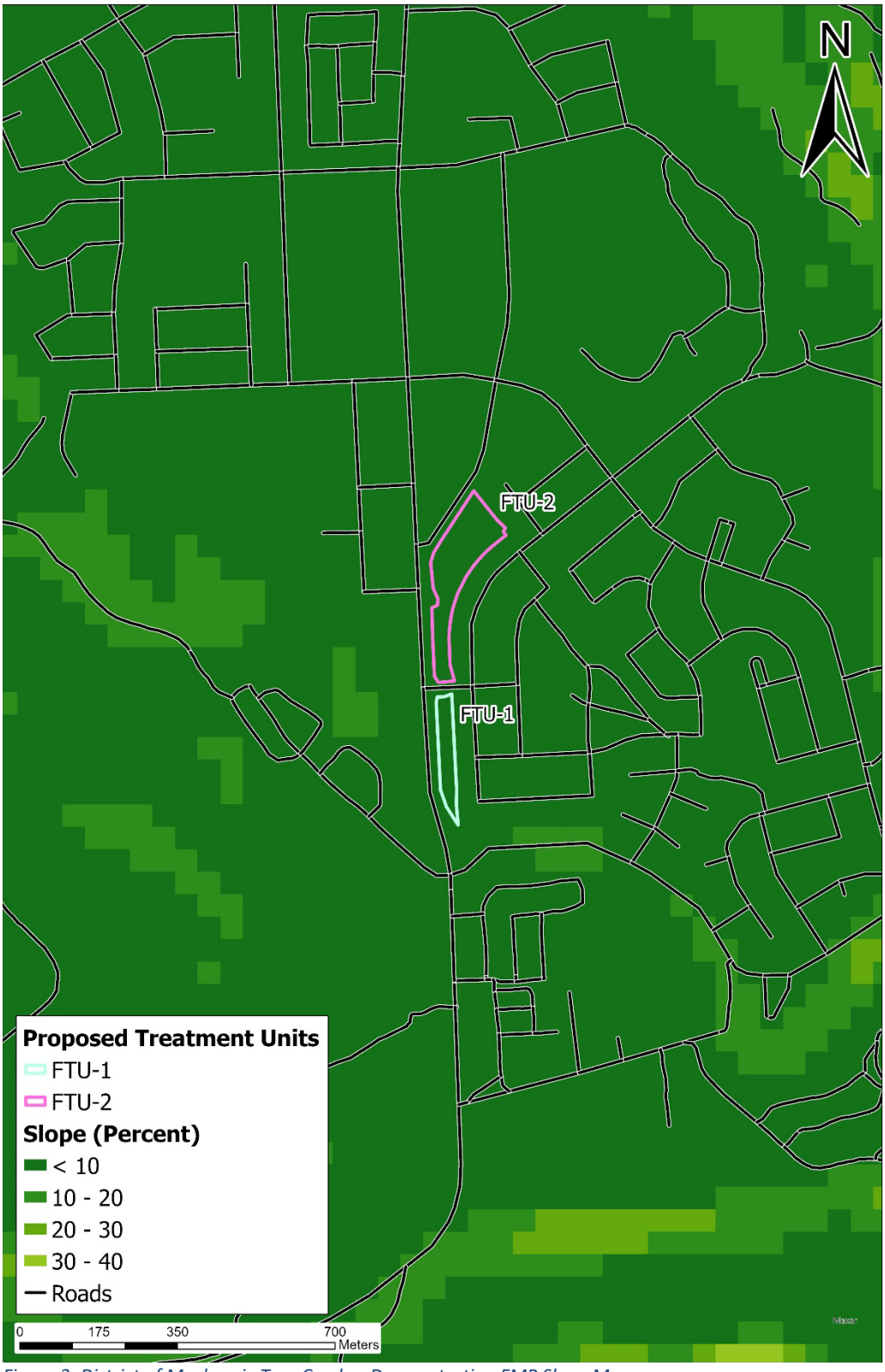


Figure 3: District of Mackenzie Tree Crusher Demonstration FMP Slope Map.

Appendix B: Representative photos of FMP area

Plot 3

Plot 4

Plot 6

Plot 7

Transcribe sampling

Plot 8

Plot 11

Plot 14

Appendix C: Fire Behaviour Outputs

Pre Treatment Conditions @90th

Treatment Unit and Fuel Type	Treatment Name	FuelCalcBC and Plot Data						likelihood crown fire (%)
		Surface Fuel Loads (SFL) (kg/m2) (1-100hr)	Crown Bulk Density (kg/m3)	Canopy Base Height (m)	Canopy Fuel Load (kg/m2)	Fuel Strata Gap (m)	Surface Fuel Consumption (SFC) (kg/m2)	
TU-1 Untreated C-3/TU1	Untreated	0.18	0.31	0.30	2.22	1.65	0.18	85.23
TU-2 Old Treatment M-2/TL2	Old Treatment	0.36	0.14	0.61	1.34	5.91	0.36	68.23
			NOTE: Both overstory and understory trees included in calculations EXCEPT Layer 4 of understory (<1.3 m)			Fuel strata gap is used in fire behavior calculations	Surface fuel loads ae used to clalculate crow n fire behavior if SFC>SFL; Often happens in stands w ith high BUI and low fuel loading	NOTE: Results produced Surface Intensity Worksh fire is predicted, then Ca and FU

Post Treatment Conditions @90th

Treatment Unit and Fuel Type	Treatment Name	FuelCalcBC and Plot Data						likelihood crown fire (%)
		Surface Fuel Loads (kg/m2) (1-100hr)	Crown Bulk Density (kg/m3)	Canopy Base Height (Pruned) (m)	Canopy Fuel Load (kg/m2)	Fuel Strata Gap (m)*	Surface Fuel Consumption (SFC) (kg/m2)	
TU-1 Untreated C-3/TU1	Untreated	0.18	0.12	3.00	1.35	7.81	0.18	45.91
TU-2 Old Treatment M-2/TL2	Old Treatment	0.36	0.12	3.00	1.13	3.07	0.36	28.38
If red, see Notes section		NOTE: Initial fuels data plus the residuals from treatment were added to get SFL post treatment. Then modified based on fuel treatment where applicable	NOTE: Both overstory and understory trees included in calculations EXCEPT Layer 4 of understory (<1.3 m)			CBH is used if understory is largely removed; if not then Fuel strata gap is used in fire behavior calculations. By modifying exisitng FSG w ith density reductions in CBD and Crow n Area	Surface fuel loads ae used to clalculate crow n fire behavior if SFC>SFL; Often happens in stands w ith high BUI and low fuel loading	NOTE: Results produced Surface Intensity Worksh fire is predicted, then Ca and FU

Treatment Notes:

TU1/TU2:	Residuals from thinning treatment are removed and so fuel loading is the same as pre treatment assuming full reducing in slash from thinning and pruning.

Weather and Site Factors

Block & Stratum	Estimated Fine Fuel Moisture (%)	Wind Speed (km/hr)	Air Temp (°C)	Relative Humidity (%)	Month	Time of Day
TU-1 TU-2	11	14.9	25.3	30	July	13:00 - 15:00

NOTE: Moisture of fine fuels estimated using weather and site variables for CFIS. Used weather station data to

Block & Stratum	Percentile used for weather data	Wx station used	Wx station Season and	Wx station elevation (m ASL)	Wx station coordinates (lat, long)	Foliar Moisture Content (%)
ALL TUs	90	Mackenzie	May 15 - Aug 31; 2010 - 2023	770	lat: 55.3042 lon: -123.1347	85.29

NOTE for Critical Surface Fire: Intensity, FMC calculator from CCP is used (taking Wx station elevation and latitude and percentile date)

FIRE WEATHER INDICES (90th PERCENTILES)

Block & Stratum	FFMC	DMC	DC	ISI	BUI	FWI
ALL TUs	91.42	65.552	484.83	8.512	94.92	25.26

Appendix D: Stand and Stock Table

Project ID:
Treatment Unit ID:
H. STAND AND STOCK TABLE
Is merchantable timber cutting prescribed? If yes, please provide details for merchantability criteria by updating diameter classes in the Layer 1 table below. A professional volume estimate is required when merchantable tree cutting is prescribed and a timber cruise should be considered when cutting >50 m^3/ha or >500 m^3 in total. ☐ Yes ☒ No FTU-1 (0.9 ha): Approximately 3,952 stems per hectare (sph) are scheduled for removal of which 99% are below merchantable specification. The larger stems to be cut will consist of only Dead Useless or danger trees and are expected to comprise 10 m^3/ha of merch-sized timber (total 9 m^3) of which **0 m^3/ha will be merchantable** (all dead-useless). FTU-2 (2.7 ha): Approximately 1,269 sph are scheduled for removal of which 97% are below merchantable specification. The larger stems to be cut will consist of only Dead Useless or danger trees and are expected to comprise 1 m^3/ha of merch-sized timber (total 2.7 m^3) of which **0 m^3/ha will be merchantable** (all dead-useless).
Are there any challenges to utilizing merchantable material? If yes, please provide details. ☐ Yes ☒ No Both FTUs: No merchantable timber to be harvested from either FTU.

Stand and Stock Table	District of Mackenzie Demo - FTU-1										
			Stem per hectare (sph)			Volume (m3/ha)			Basal Area (m2/ha)		
Species	Average Crown to Base Height (m)	Average Tree Height (m)	Existing	Cut	Leave	Existing	Cut	Leave	Existing	Cut	Leave
Layer 1 (>45 cm dbh)											
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	-	0	0	0	0	0	0	0	0	0
Total All Species	-	-	0	0	0	0	0	0	0	0	0
Total Conifer	-	-	0	0	0	0	0	0	0	0	0
Layer 1 (35-45 cm dbh)											
Sx	3	24	28	0	28	24	0	24	3	0	3
At	-	20	20	0	20	20	0	20	3	0	3
Ep	-	15	23	0	23	15	0	15	3	0	3
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	20	71	0	71	59	0	59	9	0	9
Total All Species	-	20	71	0	71	59	0	59	9	0	9
Total Conifer	3	24	28	0	28	24	0	24	3	0	3
Layer 1 (27.5-35 cm dbh)											
Sx	6	19	79	0	79	39	0	39	6	0	6
At	-	17	38	0	38	17	0	17	3	0	3
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	18.4	117	0	117	56	0	56	9	0	9
Total All Species	-	18.4	117	0	117	56	0	56	9	0	9
Total Conifer	6	19	79	0	79	39	0	39	6	0	6
Layer 1 (22.5-27.5 cm dbh)											
Bl	2	17	177	0	177	52	0	52	9	0	9
DU	-	0	52	52	0	10	10	0	3	3	0
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	17	177	0	177	52	0	52	9	0	9
Total All Species	-	13.1	229	52	177	62	10	52	12	3	9
Total Conifer	2	17	177	0	177	52	0	52	9	0	9
Layer 1 (17.5-22.5 cm dbh)											
Bl	2	12	188	0	188	25	0	25	6	0	6
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	12	188	0	188	25	0	25	6	0	6
Total All Species	-	12	188	0	188	25	0	25	6	0	6
Total Conifer	2	12	188	0	188	25	0	25	6	0	6
Layer 1 (12.5-17.5 cm dbh)											
Bl	1	8	150	0	150	0	0	0	0	0	0
At	-	14	50	0	50	0	0	0	0	0	0
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	9.5	200	0	200	0	0	0	0	0	0
Total All Species	-	9.5	200	0	200	0	0	0	0	0	0
Total Conifer	1	8	150	0	150	0	0	0	0	0	0
Total Layer 1											
Total Layer 1 - All Species	-	13.3	805	52	753	202	10	192	36	3	33
Total Layer 1 - Conifers Only	2.3	13.9	622	0	622	140	0	140	24	0	24
Layer 2 (7.5-12.49 cm dbh)											
Bl	1	5	250	250	0	-	-	-	-	-	-
At	-	12	50	0	50	-	-	-	-	-	-
Total Dead Potential	-	-	0	0	0	-	-	-	-	-	-
Total Live	-	6.2	300	250	50	-	-	-	-	-	-
Total All Species	-	6.2	300	250	50	-	-	-	-	-	-
Total Conifer	1	5	250	250	0	-	-	-	-	-	-
Layer 3 (2.5-7.49 cm dbh)											
Bl	0	3	1550	1550	0	-	-	-	-	-	-
Pl	1	3	50	25	25	-	-	-	-	-	-
At	-	7	150	0	150	-	-	-	-	-	-
Total Live	-	3.3	1750	1575	175	-	-	-	-	-	-
Total All Species	-	3.3	1750	1575	175	-	-	-	-	-	-
Total Conifer	0	3	1600	1575	25	-	-	-	-	-	-
Layer 4 (<1.3 cm dbh)											
Bl	0	1	2050	2050	0	-	-	-	-	-	-
Pl	0	0	50	25	25	-	-	-	-	-	-
At	-	1	100	0	100	-	-	-	-	-	-
Total Live	-	1	2200	2075	125	-	-	-	-	-	-
Total All Species	-	1	2200	2075	125	-	-	-	-	-	-
Total Conifer	0	1	2100	2075	25	-	-	-	-	-	-
Layer Totals											
Total All Species Layer 1	-	13.3	805	52	753	202	10	192	36	3	33
Total All Species Layer 2	-	6.2	300	250	50	-	-	-	-	-	-
Total All Species Layer 3	-	3.3	1750	1575	175	-	-	-	-	-	-
Total All Species Layer 4	-	1	2200	2075	125	-	-	-	-	-	-
TOTAL ALL LAYERS	-	4.1	5055	3952	1103	202	10	192	36	3	33

Stand and Stock Table	District of Mackenzie Demo - FTU-2										
			Stem per hectare (sph)			Volume (m3/ha)			Basal Area (m2/ha)		
Species	Average Crown to Base Height (m)	Average Tree Height (m)	Existing	Cut	Leave	Existing	Cut	Leave	Existing	Cut	Leave
Layer 1 (>45 cm dbh)											
Ac	-	25	3	0	3	10	0	10	1	0	1
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	25	3	0	3	10	0	10	1	0	1
Total All Species	-	25	3	0	3	10	0	10	1	0	1
Total Conifer	-	-	0	0	0	0	0	0	0	0	0
Layer 1 (35-45 cm dbh)											
Sx	9	27	19	0	19	22	0	22	2	0	2
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	27	19	0	19	22	0	22	2	0	2
Total All Species	-	27	19	0	19	22	0	22	2	0	2
Total Conifer	9	27	19	0	19	22	0	22	2	0	2
Layer 1 (27.5-35 cm dbh)											
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	-	0	0	0	0	0	0	0	0	0
Total All Species	-	-	0	0	0	0	0	0	0	0	0
Total Conifer	-	-	0	0	0	0	0	0	0	0	0
Layer 1 (22.5-27.5 cm dbh)											
Bl	7	23	21	0	21	9	0	9	1	0	1
Sx	6	22	67	0	67	27	0	27	4	0	4
Ep	-	21	73	0	73	25	0	25	4	0	4
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	21.7	161	0	161	61	0	61	9	0	9
Total All Species	-	21.7	161	0	161	61	0	61	9	0	9
Total Conifer	6.2	22.2	88	0	88	36	0	36	5	0	5
Layer 1 (17.5-22.5 cm dbh)											
Bl	8	16	107	0	107	20	0	20	4	0	4
Sx	4	14	50	0	50	6	0	6	1	0	1
Ep	-	12	38	0	38	9	0	9	1	0	1
DU	-	0	39	39	0	1	1	0	1	1	0
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	14.7	195	0	195	35	0	35	6	0	6
Total All Species	-	12.3	234	39	195	36	1	35	7	1	6
Total Conifer	6.7	15.4	157	0	157	26	0	26	5	0	5
Layer 1 (12.5-17.5 cm dbh)											
Bl	2	8	140	0	140	0	0	0	0	0	0
Sx	2	8	200	0	200	0	0	0	0	0	0
At	-	11	40	0	40	0	0	0	0	0	0
Ep	-	11	60	0	60	0	0	0	0	0	0
Total Dead Potential	-	-	0	0	0	0	0	0	0	0	0
Total Live	-	8.7	440	0	440	0	0	0	0	0	0
Total All Species	-	8.7	440	0	440	0	0	0	0	0	0
Total Conifer	2	8	340	0	340	0	0	0	0	0	0
Total Layer 1											
Total Layer 1 - All Species	-	12.6	857	39	818	129	1	128	19	1	18
Total Layer 1 - Conifers Only	4.1	12.6	604	0	604	84	0	84	12	0	12
Layer 2 (7.5-12.49 cm dbh)											
Bl	2	5	100	100	0	-	-	-	-	-	-
Ac	-	7	60	0	60	-	-	-	-	-	-
At	-	7	80	0	80	-	-	-	-	-	-
Ep	-	15	20	0	20	-	-	-	-	-	-
Total Dead Potential	-	-	0	0	0	-	-	-	-	-	-
Total Live	-	6.8	260	100	160	-	-	-	-	-	-
Total All Species	-	6.8	260	100	160	-	-	-	-	-	-
Total Conifer	2	5	100	100	0	-	-	-	-	-	-
Layer 3 (2.5-7.49 cm dbh)											
Bl	0	2	300	300	0	-	-	-	-	-	-
At	-	2	2220	0	2220	-	-	-	-	-	-
Ep	-	2	120	0	120	-	-	-	-	-	-
DU	-	2	20	20	0	-	-	-	-	-	-
Total Live	-	2	2640	300	2340	-	-	-	-	-	-
Total All Species	-	2	2660	320	2340	-	-	-	-	-	-
Total Conifer	0	2	300	300	0	-	-	-	-	-	-
Layer 4 (<1.3 cm dbh)											
Bl	0	0	680	680	0	-	-	-	-	-	-
Pl	0	0	60	30	30	-	-	-	-	-	-
Sx	0	0	100	100	0	-	-	-	-	-	-
At	-	1	440	0	440	-	-	-	-	-	-
Total Live	-	0.3	1280	810	470	-	-	-	-	-	-
Total All Species	-	0.3	1280	810	470	-	-	-	-	-	-
Total Conifer	0	0	840	810	30	-	-	-	-	-	-
Layer Totals											
Total All Species Layer 1	-	12.6	857	39	818	129	1	128	19	1	18
Total All Species Layer 2	-	6.8	260	100	160	-	-	-	-	-	-
Total All Species Layer 3	-	2	2660	320	2340	-	-	-	-	-	-
Total All Species Layer 4	-	0.3	1280	810	470	-	-	-	-	-	-
TOTAL ALL LAYERS	-	3.6	5057	1269	3788	129	1	128	19	1	18

See the main prescription template to document non stand and stock fuel information.

2023 District of Mackenzie Fuel Management Prescription

N

FC-1
FC-2
FTU-2
FC-4
FC-6
WTA 2
FC-7
FC-8
FC-9
FC-10
FC-11
WTA N1
FTU-1
FC-12
FC-13

- Falling Corners
- WTAs

Proposed Treatment Units

- FTU-1
- FTU-2

Land Tenures

- Crown Provincial
- Municipal
- Private
- Transmission Lines
- Roads

0 37.5 75 150 Meters

Treatment Unit ID	Treatment Method	Area (ha)
FTU-1	Manual	0.9
FTU-2	Manual	2.7
Total		**3.6**

CRI Project Number: CRI-631
Proponent Name: District of Mackenzie

Derek Li, Frontera Forest Solutions Inc.

Date: 07/31/2024