Fuel Management Operational Plan
SAMPLE DOCUMENT
February 2009

This Fuel Management Operational Plan document has been produced by First Nations Emergency Services Society (FNESS) to assist First Nations with completing their own plans.

This document was modified from a completed and approved Fuel Management Operational Plan for fuel management treatments on Reserve Lands. It is not a whole document, but instead as a possible framework to follow to complete a plan. The list of topics and the discussions under each topic cover the key components of a complete plan. The numbers in the plan outlining areas to be treated, I.R. #s etc are intentionally jumbled. No intentional inaccuracies have been created regarding site treatments, biogeoclimatic zones or forest descriptions. In addition, the Band Name and specific locations have been removed or simply replaced with XX or YY. This has been conducted to protect the band information.

Other parts of the document have not been altered. The sections on danger tree removal, spacing, pruning, wildlife trees, coarse woody debris and other fuel modification strategies are intact and could be cut and pasted into another document.

The Appendices and maps listed in the report are not included in this package.

First Nations Logo

Fuel Management Operational Plan

A. TREATMENT IDENTIFICATION

PROJECT NO.:	**FISCAL YEAR STARTED**:	**TREATMENT UNITS:**	**LICENSEE/PROPONENT NAME:** *First Nations Name*
LATITUDE: **LONGITUDE:** **ELEVATION**: meters	**LOCATION:** Geographic Location		**DATE:** *Date Plan Completed*

B. AREA SUMMARY

Band Name Reserves 1 and 2 are located on Highway #XX, between Highway #YY and the XX turn off, southeast of XX. I.R #1 follows the valley bottom in a southwest to northeast direction. I.R. #2 is rectangular with their long axis in a north/south direction. Both reserves straddle Highway #XX, with all residential housing developments occurring north of the road. Homes are scattered along the full length of both reserves, singly or in small groups. All houses are within 250 meters of the highway. All houses are located in relatively open grassland areas.

XX Creek bisects both reserves south of the residential houses.

The aspect on both reserves is mostly south to southeasterly, with flat ground along the XX Creek riparian area. Slopes vary from 2% to 35%, with the average in the 5%-10% range. The terrain is a mixture of lightly sloping open pine grasslands and rocky knobs. The sandy soils are shallow and poorly formed. Pinegrass dominates the understorey with clumps of immature Douglas-fir present on the rockier sites.

Numerous dry creek draws bisect the area in a roughly northwest to southeast direction. The draws are mostly shallow, with rounded shoulders and relatively stable side slopes up to 30%. Water flow in these draws is very intermittent, but erosion potential is very high during fast spring melt or thunder storm scenarios due to the sandy soils.

High voltage hydro transmission lines follow the valley bottom through both reserves, north of the highway.

Biogeoclimatic Zone IDF dk1

Total treatment area is 22.5 hectares (ha).

C. STAND DESCRIPTION

The forested land is dominated by ponderosa pine (Py) trees, a vast majority killed by mountain pine beetles in the last three years. Less than 2% of the mature pines are still alive. The pine are mostly open grown, poorly formed trees varying in height from 10 to 22 meters tall. Douglas-fir (Fd) is also scattered through the area, located mostly on I.R #1 and on the rockier sites north of the highway and south of XX Creek. The Douglas-fir north of the highway are mostly immature and poorly formed co-dominant trees. Mature stands of Douglas-fir are present along the south side of XX Creek. A minor amount of Spruce Budworm damage is noted on the Douglas-fir on the two reserves. Spruce Budworm damage is more severe west of

the reserves.

The forests are generally thrifty, with severe moisture deficits common in this biogeoclimatic zone during the summer growing season. The ponderosa pine volumes vary from 20 cubic meters per hectare around the houses to 40-70 cubic meters per hectare south of the highway. These volumes, coupled with the poor form exhibited, suggest timber harvesting is not a cost effective treatment.

D. GOAL

The management goal is to reduce the wildfire threat, fuel loading build up and danger trees around the developments and the surrounding area. This will be accomplished through the removal of pine beetle killed Py trees, followed by forest fuel management treatments on the remaining forest stands. These activities will be controlled by the following principles.

1. Retention of the herbs, grasses and shrubs that provide the ground cover.
2. Retention of the healthy Douglas-fir and ponderosa pine forest component.
3. Retention of the advanced regeneration of Py and Fd.
4. Retention of high quality wildlife trees where present, in safe locations, to maintain wildlife habitat and vertical structure.
5. Retention and addition of Coarse Woody Debris to promote wildlife habitat.

E OBJECTIVES

Wildfire threat reduction work will be comprised of two main objectives.

1. The removal a majority of the green attack, red attack and dead ponderosa pine (Py) trees within 100 meters of the homes and developments. This activity will occur in all Treatment Units (TUs), as shown on the Fuel Management Treatment Units map in Appendix A. The Py retention will by made up of dead and alive wildlife trees, advanced regeneration and Py not attacked by pine beetle. This will be conducted to;
   - improve public and homeowner safety,
   - remove a large source of future surface fuel loading before it falls and substantially increases the surface fuel loading and wildfire threat to the adjacent homes,
   - improve firefighter safety and access in the event of fire suppression activities,
   - greatly improve the effectiveness of aerial fire control tools.

2. The modification of the remaining forest stand to ensure that the area will not support an aggressive, fast moving crown fire. This treatment will involve a combination of spacing, pruning of the remaining conifers and surface fuel removal to meet Fire Smart guidelines. The intention is to retain a multi-aged Fd stand with a minor Py component of the healthiest trees on site. Spacing is to focus more on forest health, not diameter limits. These activities will be conducted on Treatment Units XX and YY located on I.R. #2.

F MANAGEMENT STRATEGIES

F.1 General Discussion

Nineteen areas have been identified as requiring fuel management treatments. All Treatment Units (TUs) will require some amount of dead pine removal. The dead ponderosa pine tree removal work will focus on the removal of all pine beetle killed ponderosa pine trees

except those marked for retention as wildlife trees. Retained trees are placed in No Work Zones (NWZs) if they are dangerous for the crew activities, or marked with orange wildlife tree and/or yellow flag if they are safe. A combination of heavy equipment use and hand treatments will be required. The heavy equipment use will be focused on the open pine stands south of the highway, TUs 1, 6 and 12 on I.R. #2. Some equipment use may be required around the houses for moving the larger stems. Hand felling, and on site burning or chipping, of the targeted trees will be required in other TUs. Chipping will be the preferred method of branch and top removal around the houses. Piling and burning will be the preferred method in the less accessible areas, and south of the highway.

F.2 On Site Burning

Hand constructed burn piles should be at least ten meters from the coarse woody debris, hydro lines, fence lines and retained trees to prevent scorch and stress. Machine burn piles must be located at least forty meters (horizontal distance) from the hydro lines, and twenty meters from coarse woody debris, fence lines and retained trees. All slash piles will be randomly distributed throughout the area and will be burned progressively with the falling or within 9 months after piling consistent with the B.C. Wildfire Act and Wildfire Regulation Hazard abatement requirements. All burning will be completed under a burn reference number issued by the Ministry of Forests and Range at the Kamloops Fire Center (250) 554-5500.

In a tight forest canopy, the hand piles must be moved to a more open site or a small fire ignited and the remaining material added to it slowly to keep flame height and fire intensity low. Where no other options exist, voids can be cut in the forest to accommodate burning. Voids should be constructed in areas of small diameter trees where site impact is minimized.

Burning of piles should be left to the late Fall and winter, and conducted under conditions that will minimize spread.

F.3 Coarse Woody Debris

Coarse woody debris already in place will be retained as long as it is in close contact with the surface and has lost all the fine needles and twigs that would be a wildfire hazard. Present coarse woody debris (CWD) is highly variable. Additional CWD will be recruited in all TUs through identification and retention of wildlife trees and by falling and retaining trees on site. All retained CWD will be red or grey attack ponderosa pine and Douglas-fir dead more than one year. Live Douglas-fir will not be felled and used as CWD due to Douglas Fir Bark Beetle concerns. The minimum size for CWD is 25 cm dbh and 5 meters in length.

In hand treatment units, CWD can be left as 1 in 5 trees felled over 30 cm in diameter. No CWD should be left within 30 meters of structures. Most limbs and the top down to 20 cm diameter should be removed from the CWD stem and burned on site or removed from the site. Four to six main branches can be left on the topside of the tree to provide perching opportunities. Some limbs can be left on the tree if the stem is located on a slope over 15%, to ensure stability. Stump heights of 0.8 to 1.2 meters are preferred when falling Py to be left as CWD. CWD should be the largest stems on site, not bucked (except for top removal) and in safe locations.

In heavy equipment treatment units, additional CWD to be added to the site should be targeted at 5-10 stems per hectare. The selected trees should be stubbed, when a feller/buncher is used, at least four meters in height with the top dropped within 5 meters of the retained stub. The top should be flattened to the ground so the main stem is in close contact with the surface. All limbs can be left on the stem. When hand falling will occur, CWD

designated trees are to be felled and limbed to lay flat on the ground. Vertical limbs and stabilization limbs can be left on the stem.

F.4 Spacing and Pruning

The fuel management strategy on the remaining conifers will involve spacing, pruning and surface fuel removal to reduce the wildfire hazard in these areas to acceptable levels as per the Fire Smart guidelines as endorsed by the Ministry of Forests and Range – Protection Branch. This treatment will be carried out on TUs XX and YY. Pine removal and conifer spacing and pruning activities can be completed simultaneously to mix the dry, dead pine trees with the green conifer trees and branches to improve the quality of burning. A majority of this work will involve:

1. Hand felling, piling and burning, or removal from the site, of all dead conifers not marked for wildlife tree retention. This includes small diameter Douglas-fir and ponderosa pine scattered through TUs XX and YY. Follow CWD guidelines for this activity.

2. Spacing the live Douglas fir retained after the dead stem removal. The spacing should leave the healthiest and largest trees on site, plus suitably located wildlife trees. This is often referred to as spacing from below. Approximately 25% of the Fd trees less than 15 cm dbh are suppressed. These trees are the main target for spacing. The spacing activities will be conducted to minimize tree competition.

   The suppressed trees targeted to be removed include:

   - those growing within the drip line of a larger live Fd or Py that will be retained, and
   - trees less than 15 cm dbh and less than 20% live crown, or
   - trees less than 15cm dbh with mushroomed tops or no distinct leader, or
   - trees less than 15 cm dbh with Atropellis canker on the stem.
   - No healthy conifers over 20 cm dbh should be removed during the spacing activities.

   When Fd and Py regeneration is mixed, Py less than 10 cm dbh, not attacked by pine beetle, should have priority for retention to retain biodiversity on the site. The retention of Fd and Py less than three meters in height that appear healthy and not in direct competition with other conifers is very important to maintain the multi-aged stand characteristics.

   Spaced stumps should be no higher than 10 cm high, at an angle of less than 15 degrees from the horizontal.

3. Pruning the regeneration and retained conifers.

   The pruning height standard will vary with tree height. Trees in excess of five meters tall will be pruned to a minimum of three meters to the lowest branch on the high side of the slope. Pruning height will be increased to a minimum of four meters in height on slopes of 15 to 30%, while maintaining a minimum of 40% live crown on every tree. Trees three to five meters tall will be pruned as high as possible while retaining a minimum of 40% of the live crown. Trees less than 3 meters in height will not require any pruning at this time. Pruning includes the removal of dead, dry branches. Where possible, pruning should be completed by hand with loppers or other suitable pruning tools. High pruning will have to be conducted with power pruners or drag saws. Chainsaw pruning is not acceptable.

   Care must be taken to minimize tree scarring. Branch stubs up to 3 cm in length are

preferred to stem scarring.

PRUNING REGIME

Tree Height (m)	Slope (0 – 15 %)	Slope (16 – 30 %)	Slope (31 % >)
< 3	None	None	None
3.1 – 5.0	The lower of 3 m or 40% live crown	The lower of 3 m or 40% live crown	The lower of 3 m or 40% live crown
5.1 >	3 meters	The lower of 4 meters or 40% live crown	The lower of 5 meters or 40% live crown

Dry dead branches must be included in the pruning. Pruning will be required in TUs XX and YY.

Designated wildlife trees require no pruning.

4. Surface Fuel Reduction

Surface fuel removal will involve removal of all spaced and pruned material and any material remaining from the pine beetle tree removal, other than designated CWD. This material is to be removed or piled and burned on site or chipped and removed. Burning or chipping options will depend on site access. Present surface fuel loadings are minimal and meet FireSmart standards. Ensuring that no additional fuel is added to the surface accumulations by removing all spacing and pruning material will ensure that surface fuel loadings are not increased during the fuel management efforts.

F.5 Wildlife Trees

Retention of wildlife trees in safe locations is an integral part of the operational plan. The removal of dead pine trees around the houses will significantly reduce the number of large pines in the area. These large pine trees are high value wildlife trees. Retention of these trees should be attempted wherever possible.

The largest dead ponderosa pine along the XX creek RMA will be retained if they will not reach and homes or developments, including access roads, when they fail. Consider topping and modifying the trees into a safe condition before falling whenever possible. Target trees for retention in the machine treatment areas include;

- larger than 30 cm at diameter breast height,
- signs of decay, especially in the top of the tree
- a reasonably sound lower stem and root system so they might stand for a long period of time.
- Trees with forked tops, missing top or signs of animal activity including open nests, nesting cavities, claw marks on stem or other signs of use.

F.6 Riparian Management

The XX Creek riparian management area (RMA) will be impacted by the danger tree removal around the houses south of the creek. The RMA consists of a flat flood plain area dominated by deciduous brush, then a steep bank to the north, with houses within 30 meters of the top of the bank. The steep bank has limited surface cover and is highly unstable, consisting of loose sand and gravel sized material. A total of 27 danger trees, all dead ponderosa pine, have been identified and marked for removal along the top of the creek bank. This represents

approximately 5% of the dead pines found along the RMA. To minimize the impacts on the RMA, the following steps have been taken;

a. Only dead trees that could directly impact the safety and structures of the local homeowners have been marked for removal.
b. Three high value wildlife trees are to be modified through topping and partial limb removal to retain on site instead of falling.
c. The stems that are felled onto the unstable slope above the creek are to be left in place to minimize site impacts from skidding and to assist with bank stabilization.
d. All burning of branches and tops will occur in locations that will minimize the impacts on riparian vegetation. Main branches, up to two meters in length will be left on the stems for stem stabilization.
e. None of the trees to be felled will land in the creek itself, stream flow will not be affected.

F.7 Hydro Transmission Lines

High voltage hydro transmission lines follow the valley bottom north of the highway. They impact the fuel management treatments in TUs 1, 2, 9, 11, 12 and 17. Hydro has been contacted to discuss the tree removal within the limits of approach of the hydro lines. No agreement has been reached for their removal (June 15, 2008).

Secondary transmission lines are located south of the highway, with feeder lines to all homes on both reserves. A total of 26 danger trees within the limits of approach have been identified north of the highway along the secondary transmission line and the feeder lines to the houses. These trees must be felled by hydro designated crews with the clean up as part of this site plan.

Hydro Contact from B.C. Hydro has been contacted about the danger tree removal. He has made a commitment to remove the identified trees around the houses and feeder lines in a timely manner once a Section 4 permit has been issued. The trees will be felled at no cost, the clean up will be the responsibility of the Band through this Site Plan.

Hydro Contact:
XX
B.C. Hydro
Forest Health Issues and Projects
Kamloops

F.8 Marking System

The treatment unit and tree marking system employed for this project includes:

1. The layout of the heavy equipment TUs is completed with orange flagging.
2. Safe to work around wildlife trees are marked with orange wildlife tree flag and/or solid yellow flag.
3. Dangerous wildlife trees are marked with yellow danger tree flag and placed in yellow No Work Zone flagged areas.
4. Danger trees marked for removal around houses have yellow danger tree flag wrapped around their stem at 1.3 meters or higher plus a blue flag with an unique number attached.
5. Archeological sites identified in the AOA report will be marked with yellow No Work Zone

flags to ensure no activities disturb these sites. Individual trees were also marked with 'candystriped' blue & white and or with 'candystriped' black & pink. Identification of the locations these sites will be a part of the crew safety/operational briefing before work commences.

F.9 Firewood Utilization

Discussions with the local homeowners suggest that all accessible felled danger trees in and around the houses will be valued as firewood for local consumption. Bucking the main stems into firewood lengths and left on site for local use will be the standard practice. Some of the firewood will have to be moved a short distance to make it more accessible for the local homeowners. Firewood movement will be completed by hand crews or with small tracked equipment.

F.10 Heavy Equipment Use

The soils in the XX Creek valley are very sandy and coarse and prone to erosion and soil disturbance. Limiting the impacts of heavy equipment on the soils, bunchgrass and other surface cover will be extremely important for the long term health of the grasslands. The soils are most susceptible during wet or newly thawed conditions. These conditions are to be avoided whenever possible. The best conditions for heavy equipment use will be on very dry or frozen soils. Frozen soils with snow pack exceeding 30 cm in depth would be preferred, but these sites rarely experience such conditions. The best local conditions usually occur in the late fall and winter, with the grass dormant and the soil dry. Daily inspection of soil conditions will be required to ensure the soils will not be excessively impacted by the heavy equipment.

F.11 Archeological Overview Assessment (AOA)

An AOA field assessment and report have been completed internally by the XX Band. The report is attached to this plan. All recommendations and no work zones will be followed during these fuel management activities. Archeological sites that require protection from all fuel management activities have been identified in TUs XX and YY. All sites will be clearly marked with yellow No Work Zone flagging. Addressing AOA issues will be part of the pre-work safety/operational briefing held with the equipment and hand crews before any work commences on the site.

F.12 Department of Fisheries and Oceans

Removal of danger trees along the XX Creek RMA has been referred to XX, at DFO in Kamloops. The letter dated June 17th, 2008 outlining the site impacts and soliciting his input is attached. A follow up telephone call was made on XX, 2008 in an effort to receive a response. No return call was received by the time this plan was finalized. Comments or input received in the future from DFO may have to be incorporated into the plan as an amendment.

G SITE SPECIFIC ACTIVITIES BY TREATMENT UNIT

The above general descriptions cover treatment guidelines for all TUs. Site specific descriptions and treatments are included below for each TU.

Treatment Unit Summary - XX Band

TU #	Area (ha)	Treatment	Danger Trees[1]	Hydro Trees[2]	Riparian Trees[3]	Wildlife Trees[4]	Estimated Cost ($)[5]
1	9.5	Heavy Equipment[6]	N/A	N/A	N/A	45	21900
2	9.6	Heavy Equipment	N/A	N/A	N/A	50	21160
3	5.3	Danger Tree Removal[7]	41	8	2		10700
4	0.7	Danger Tree Removal	10	0	7		2200
5	0.6	Danger Tree Removal	14	0	10		4400
6	0.9	Danger Tree Removal	28	3	0		4200
7[8]	0.8	Danger Tree Removal					2160
8	2.6	Danger Tree Removal	13	0	4		5200
9	2.3	Heavy Equipment	N/A	N/A	N/A	10	6610
10[9]	1.1	Danger Tree Removal					1800
11	1.7	Hand Treatments[10]	N/A	N/A	N/A	25	8850
12	3.7	Hand Treatments	N/A	N/A	N/A	10	8800
13	1.4	Danger Tree Removal	10	5	2		1500
14	2.5	Hand Treatments	N/A	N/A	N/A	15	4250
15	2	Danger Tree Removal	39	8	0		6400
16	1.5	Danger Tree Removal	18	1	0		2700
17	8.9	Hand Treatments	N/A	N/A	N/A	20	23420
18	1.9	Danger Tree Removal	14	1	2		1950
19	1.1	Danger Tree Removal	5	0	0		1500
Totals	**58.1**		**192**	**26**	**27**	**175**	**139700**

[1] Danger Trees - total number of trees to be removed on the site
[2] Hydro Trees - number of trees within limits of approach of Hydro lines
[3] Riparian Trees - number of trees on Bonaparte Creek RMA
[4] Wildlife Trees - number of trees marked for retention
[5] Estimated Cost ($) - direct cost of site treatments, excluding supervision, planning, etc
[6] Heavy Equipment - area based treatment involving the removal of a majority of the dead pine
[7] Danger Tree Removal - falling and removal of danger trees around structures
[8] Unable to contact homeowners for consultation for tree removal
[9] Unable to contact homeowners for consultation for tree removal
[10] Hand Treatments - dead pine removal plus spacing and pruning

G.1 TU's A, B and C – 21.4 hectares

All three treatment units are located on the south side of Highway #XX on I.R #2. The stand structure is very similar for all, consisting of open ponderosa pine stands that have been almost completely killed by the mountain pine beetle. A small number of Douglas-fir are also present. The slopes do not exceed 15% except for:

- TU 2 – a very small portion (less than 0.5ha) in the northeast corner which goes up to 45%;

The soils throughout are very sandy, poorly developed and highly susceptible to heavy equipment impacts during wet or newly thawed conditions. The timber is of poor quality in low volumes. Timber salvage has been ruled out due to the increased site impacts, timber quality and poor market conditions (as of XX, 2008).

Treatment

1. Feller/buncher and excavator to fall and pile the timber for burning. All unmarked trees to be removed. Fence posts are to be cut at a minimum of 2 meters in height.
2. Road control required when felling trees within 2 tree lengths of the highway.
3. Approximately 5 wildlife trees/ hectare have been identified in each Treatment Unit (unless otherwise limited by hydro lines). Retain marked wildlife trees and arch sites as discussed above.
4. Burn piles to be no more than four meters high to minimize flame length.
5. Burn piles to be placed at least 40 meters, horizontal distance, from the high voltage hydro transmission lines. On site discussions with B.C. Hydro representative necessary before burn piles are constructed.
6. Burn piles to be located at least twenty meters from fence lines, wildlife trees and CWD.
7. Burn piles to be ignited in the late Fall or Winter under low wind and proper venting conditions, preferably with at least partial snow cover under a burn reference number issued by the Kamloops Fire Center, (250) 554-5500.

Concerns

1. Permission to remove trees within the limit of approach of high voltage transmission lines required from BCTC.
2. All horses and other livestock must be removed from the area while treatment occurs.
3. Highway control required for tree removal within 2 tree lengths of the highway.

G.2 TU's X, Y, Z – 16.8 hectares

All four treatment units are located adjacent to Highway #XX on I.R. #1. These TUs are to be treated by hand because of small areas, steep, rocky slopes and the retention of a majority of the Douglas-fir trees.

Treatment

1. Removal of all dead ponderosa pine trees except those marked as wildlife trees. Falling, piling and burning of the trees will be the most efficient method of tree removal.
2. Coarse Woody Debris retention as per F3 above.
3. Spacing and pruning as per F4 above. Spacing and pruning efforts will be limited to TUs XX and YY.
4. Piling and burning of all the spacing and pruning material. Burn piles must be at least thirty meters from hydro installations. Burn piles must be at least ten meters from fence lines, wildlife trees and CWD.
5. Burn piles to be ignited under late Fall or Winter conditions under a burn registration number from the Kamloops Fire Center, (250) 554-5500.

Concerns

4. Permission to remove trees within the limit of approach of high voltage transmission lines required from BCTC.
5. All horses and other livestock must be removed from the area while treatment occurs.
6. Highway control required for tree removal within 2 tree lengths of the highway.

G.3 TU's 3-8, 10, 13, 15, 16, 18, 19 – 19.9 hectares

Treatment Units 3-8, 10, 13, 15, 16, 18 and 19 all involve the removal of danger trees in and around the houses on Indian Reserves 1 and 2. Each tree designated for removal has been marked and numbered. The spreadsheets for each site are attached at the end of the Site Plan in Appendix B.

Danger Tree Removal - XX Band

TU #	Area (ha)	Treatment	Total Danger Trees	Hydro Trees	Riparian Trees	Modified Trees	Estimated Cost ($)
3	5.3	Danger Tree Removal	41	8	2	3	10700
4	0.7	Danger Tree Removal	10	0	7	0	2200
5	0.6	Danger Tree Removal	14	0	10	1	4400
6	0.9	Danger Tree Removal	28	3	0	1	4200
7	0.8	Danger Tree Removal					2160
8	2.6	Danger Tree Removal	13	0	4		5200
10	1.1	Danger Tree Removal					1800
13	1.4	Danger Tree Removal	10	5	2		1500
15	2	Danger Tree Removal	39	8	0	2	6400
16	1.5	Danger Tree Removal	18	1	0		2700
18	1.9	Danger Tree Removal	14	1	2		1950
19	1.1	Danger Tree Removal	5	0	0		1500
Totals	**19.9**		**192**	**26**	**27**	**7**	**44710**

Treatment

1. Hand falling of all marked danger trees as per the attached spreadsheets.

2. Modifying the identified trees. Seven of the largest, highest value wildlife trees were identified for modification instead of removal to retain some vertical structure for wildlife and aesthetic values. The selected trees are all a safe distance from structures, exhibit safe root and stem characteristics and should stand for an extended period of time in a modified condition.

3. Manage riparian trees. Twenty-seven trees have been marked for removal along the upper lip of the XX Creek Riparian Management Area (RMA). All trees are dead ponderosa pine within reach of houses or other structures. These trees should be managed as discussed in Riparian Management above.

Modification standards are:

a. Tree topped between ½ and 2/3 of original height. Tree diameters will be a minimum of 30 cm at topping site. Topping location is preferably roughed up to simulate a natural failure.

b. All branches showing signs of decay, stress or other potential for failure will be cut flush with the bole of the tree.

c. Stable, large limbs will be cut at a minimum of 1 meter, maximum of 2 meters, in length. The remaining tree branches should be at least 10 cm in diameter. At least twelve large branches should be left on each tree if possible.

d. Tree climbing and modification will be completed by an individual or company that can prove past experience, proof of the required insurance and a clearance letter from worksafebc demonstrating good standing.

4. Chip and remove all tree limbs and tops down to 15 cm.

5. Buck tree stems into firewood round lengths for local use. Move rounds with poor access to more suitable locations for collection.

6. Approved Hydro crews will be required to remove the 26 trees identified around the houses. The crews typically fall and limb the trees but do no further clean up. Additional clean up will be required under this Site Plan. All Hydro trees will be treated the same as other trees removed for safety purposes.

Concerns

1. Danger tree falling around houses and other structures must be completed by a worksafebc certified faller with proof of experience, the required insurance and a clearance letter from worksafebc demonstrating good standing.

2. Spotter must be employed at all times to ensure locals do not enter the active falling area.

H. CREW OPERATIONAL AND TRAINING REQUIREMENTS

Forest fuel management is a relatively new activity. The crew hired or contracted to complete the work in this area needs to be adequately trained to perform their work to the standards established in this plan. Training intensity will depend on the experience and past training of the crew. At a minimum the training should last for at least four hours. The training can be conducted on site as part of the pre-work safety meeting. The training and pre-work safety meeting should include at a minimum:

a. Review of wildfire suppression techniques including use of handtools, pumps and initial attack concepts.

b. Review of the applicable worksafeBC requirements for forestry operations including; buddy system, communication system, summoning assistance, first aid requirements, list of contact numbers, safe working distances, danger tree falling, stump heights and angles for spacing.

c. Special considerations when working in urban areas.

- hours of work from 8 am to 5 pm (800-1700) for equipment use. This is to minimize noise in residential areas.

- alerting local residents before work activities commence and before any burning is conducted.

- Constant monitoring of burn piles to ensure local children or animals do not approach.

- Extinguishing burn piles before leaving the site at the end of the day or constant monitoring for larger piles left to burn overnight.

- Spotter employed whenever falling activities occur to ensure the public or local residents do not enter the active falling area.

I. CONSULTATIONS

XX, band councilor, has been responsible for consulting with band members on I.R.s 1 and 2. Owners of residential homes with dead pine trees in the yards have been directly contacted about the danger tree removal options being offered. Signed tree removal agreement letters for all TUs that involve danger tree removal around houses are on file at the Band Office. All band members on I.R.s 1 and 2 have had a letter hand delivered to their residence outlining the tree removal plans. XX has spoken to all individuals and canvassed their comments.

Consultations have also been completed with B.C. Hydro and Department of Fisheries and Oceans.

J. SILVICULTURE

The Goal of these activities is to reduce the wildfire hazard to the adjacent community in the long term. The wildlife trees and advanced regeneration retained after the treatments will have to be maintained to minimize wildfire hazard through a regular regime of spacing, pruning and surface fuel removal.

Opportunities for planting of conifer seedlings within the treatment units will be assessed after the treatments are complete.

K. BIODIVERSITY

Wildlife trees are to be retained whenever possible as identified in the field. High value wildlife trees are present in the ponderosa pine stands within the TUs south of the highway. At least 161 dead ponderosa pine wildlife trees have been marked for retention within the heavy equipment TUs, at a density of 4-6 per hectare. The designated wildlife trees are to be retained as coarse woody debris when they fall.

The entire valley bottom, especially the southern exposure areas that remain relatively snow free most of the year, is good overwintering mule deer habitat. Removal of the pine trees will allow for easy access through the area that would be reduced if the pine were allowed to fall over. The impacts will be greatest in TUs XX and YY where a majority of the pine trees will be removed. Browse opportunities may increase as more light reaches the forest floor after treatment.

The spacing and pruning work will remove a portion of the lower branches and stems, making the area more open and reducing the protection and visual barriers found in the present Fd clumps. This treatment will be limited to TUs XX and YY, covering less than 5 hectares. No pruning of trees less than three meters in height will minimize these impacts. This will be offset by easier access and more browse and grazing opportunities.

An Environmental Assessment review by XX of YY is attached.

L. ADMINISTRATION

SITE PLAN PREPARED BY (RPF SIGNATURE AND SEAL):	
RPF Name (Printed) Date: RPF No:	RPF Signature and Seal
ATTACHMENTS:	
Appendix A Treatment Unit Maps Appendix B Danger Tree Marking Spreadsheets AOA Report DFO Referral Letter Environmental Assessment	

M. APPROVAL

Approval Authority	
Name (Printed) Title: _____ Date: _____	Signature

APPENDIX A

TREATMENT UNIT MAPS

APPENDIX B

Danger Tree Marking Spreadsheets

Danger Tree Removal Around Houses

XX Band - Forest Fuel Plan

Indian Reserve #1

TU	Tree #	Removal	Diameter (cm)	Comments
A	1	Hand Fall	50	
	2	Hand Fall	55	
	3	Hand Fall	40	Wire in Tree Bole
	4	Hand Fall	40	Garbage at Base
	5	Hand Fall	45	
	6	Hand Fall	38	
	7	Hand Fall	42	
	8	Hand Fall	40	
	9	Hand Fall	38	
	10	Hand Fall	32	Hydro
	11	Hand Fall	30	Hydro
	12	Hand Fall	20	
	13	Hand Fall	20	
	14	Hand Fall	23	
	15	Hand Fall	48	Riparian
	16	Hand Fall	55	Riparian - adjacent to house
	17	Hand Fall	37	Adjacent to House
	18	Hand Fall	57	Adjacent to House
	19	Hand Fall	30	Hydro
	20	Hand Fall	30	Hydro
	21	Hand Fall	37	Hydro
	22	Hand Fall	25	Nails in Tree Bole
	23	Hand Fall	43	
	24	Hand Fall	46	
	25	Hand Fall	37	
	26	Hand Fall	32	Remove Above Fort
	27	Hand Fall	27	Remove Above Fort

XX Indian Band - Forest Fuel Plan

Indian Reserve #1

TU	Tree #	Removal	Diameter (cm)	Comments	
B	1	Hand Fall	60	Tied to #2	Riparian
	2	Hand Fall	25	Tied to #1	Riparian
	3	Hand Fall	35	Wire	Riparian
	4	Hand Fall	47	Wire	Riparian

Trees 1-6 burn on site
Trees 7-10 firewood/chip

XX Band - Forest Fuel Plan

Indian Reserve #1

TU	Tree #	Removal	Diameter (cm)	Comments
C	1	Hand Fall	32	Riparian

	2	Hand Fall	65	Riparian
	3	Hand Fall	58	Riparian
	4	Hand Fall	27	Riparian
	5	Hand Fall	28	Riparian

Trees 1-5 Burn on site

Bonaparte Indian Band - Forest Fuel Plan

Indian Reserve #1

TU	Tree #	Removal	Diameter (cm)	Comments
6	1	Hand Fall	55	
	2	Hand Fall	26	
	3	Hand Fall	27	
	4	Hand Fall	25	
	5	Hand Fall	28	
	6	Modify	32	
	7	Hand Fall	26	
	8	Hand Fall	24	
	9	Hand Fall	31	Hydro
	10	Hand Fall	20	
	11	Hand Fall ?	62	Hydro - Danger Tree
	12	Hand Fall	45	Hydro
	13	Hand Fall	32	

Bonaparte Indian Band - Forest Fuel Plan

Indian Reserve #1

TU	Tree #	Removal	Diameter (cm)	Comments
8	1	Hand Fall	37	1-3 tied together
	2	Hand Fall	35	
	3	Hand Fall	48	
	4	Hand Fall	20	
	5	Hand Fall	53	Riparian
	6	Hand Fall	43	Riparian
	7	Hand Fall	33	Riparian
	8	Hand Fall	28	Riparian
	9	Hand Fall	31	Leave stub for fence
	10	Hand Fall	20	
	11	Hand Fall	42	
	12	Hand Fall	39	
	13	Hand Fall	37	Highway control required

Bonaparte Indian Band - Forest Fuel Plan

Indian Reserve #2

TU	Tree #	Removal	Diameter (cm)	Comments
13	1	Hand Fall	45	Old powerline tied to tree
	2	Hand Fall	18	Beside House
	3	Hand Fall	28	Part of Fence
	4	Hand Fall	45	Part of Fence - Riparian

	5	Hand Fall	34	Part of Fence - Riparian
	6	Hand Fall	48	Hydro - part of Fence
	7	Hand Fall	44	Hydro
	8	Hand Fall	58	Hydro
	9	Hand Fall	53	Hydro
	10	Hand Fall	33	Hydro

No Contact with homeowner as of May 14th, 2008

Bonaparte Indian Band - Forest Fuel Plan

Indian Reserve #2

TU	Tree #	Removal	Diameter (cm)	Comments	
15	1	Hand Fall	40		
	2	Hand Fall	38		
	3	Hand Fall	12		
	4	Hand Fall	8		
	5	Hand Fall	36		
	6	Hand Fall	23		
	7	Hand Fall	26		
	8	Hand Fall	29		
	9	Hand Fall	23		
	10	Hand Fall	18		
	11	Hand Fall	32		
	12	Hand Fall	18		
	13	Hand Fall	24		
	14	Hand Fall	37		
	15	Hand Fall	34		
	16	Hand Fall	44		
	17	Hand Fall	35		
	18	Hand Fall	24		
	19	Hand Fall	25		
	20	Hand Fall	22		
	21	Hand Fall	23		
	22	Hand Fall	28		
	23	Hand Fall	43		
	24	Hand Fall	35		
	25	Modify	38	Fall above clothesline	Hydro
	26	Modify	33	Fall above clothesline	Hydro

Bonaparte Indian Band - Forest Fuel Plan

Indian Reserve #2

TU	Tree #	Removal	Diameter (cm)	Comments
16	1	Hand Fall	29	
	2	Hand Fall	34	
	3	Hand Fall	36	
	4	Hand Fall	38	
	5	Hand Fall	60	Over wood storage
	6	Hand Fall	38	
	7	Hand Fall	47	
	8	Hand Fall	31	

	9	Hand Fall	30	
	10	Hand Fall	27	
	11	Hand Fall	31	
	12	Hand Fall	35	
	13	Hand Fall	35	
	14	Hand Fall	26	
	15	Hand Fall	23	
	16	Hand Fall	21	
	17	Hand Fall	38	
	18	Hand Fall	37	Hydro

Bonaparte Indian Band - Forest Fuel Plan
Indian Reserve #2

TU	Tree #	Removal	Diameter (cm)	Comments
18	1	Hand Fall	33	
	2	Hand Fall	34	Hydro/House
	3	Hand Fall	30	Wire
	4	Hand Fall	44	Nails
	5	Hand Fall	31	
	6	Hand Fall	38	
	7	Hand Fall	38	Riparian
	8	Hand Fall	43	Riparian
	9	Hand Fall	27	
	10	Hand Fall	41	Part of play fort
	11	Hand Fall	65	Beside House
	12	Hand Fall	30	Beside Driveway
	13	Hand Fall	26	Beside Access Road
	14	Hand Fall	57	

Bonaparte Indian Band - Forest Fuel Plan
Indian Reserve #2

TU	Tree #	Removal	Diameter (cm)	Comments
19	1	Hand Fall	40	
	2	Hand Fall	25	
	3	Hand Fall	25	
	4	Hand Fall	23	
	5	Hand Fall	28	

June 17, 2008

Department of Fisheries and Oceans
985 McGill Place
Kamloops, B.C.

Sean,

RE: Tree Removal Along XX Creek

I am contacting you on behalf of the XX Band, which is planning a danger tree removal program on I.R.s 1 and 2 on highway #XX, northwest of XX. The program involves the removal of danger trees around houses, hydro lines and access roads for local resident safety and long term wildfire threat reduction. A total of 27 dead ponderosa pine trees located along the upper bank of the XX Creek riparian management area have been identified and marked for removal. I am seeking your input into this activity.

The Site Plan for the tree removal states:

F.5 Riparian Management

The XXe Creek riparian management area will be impacted by the danger tree removal along around the houses north of the creek. The RMA consists of a flat flood plain area dominated by deciduous brush, then a steep bank to the north with houses within 30 meters of the top of the bank. The steep slope has limited surface cover and is highly unstable, consisting of loose gravel. A total of 27 danger trees, all dead ponderosa pine, have been identified and marked for removal along the top of the creek bank. This represents about 5% of the large, dead pines found along the RMA. To minimize the impacts on the RMA, the following steps will be taken;

f. Only dead trees that could directly impact the safety and structures of the local homeowners have been marked for removal.
g. Three high value wildlife trees are to be modified through topping and partial limb removal to retain on site instead of falling.
h. The stems that are felled onto the unstable slope above the creek are to be left in place to minimize site impacts from skidding and to assist with bank stabilization.
i. All burning of branches and tops will occur in locations that will minimize the impacts on riparian vegetation.
j. None of the trees to be felled will land in the creek itself, stream flow will not be affected.

The Site Plan will under go a review by XX

If you have any questions or comments regarding this danger tree removal treatment, please contact me at your convenience at (250) 573-6066 or XX. I would appreciate any input you have.

Yours truly,