HAP 2.0 Enhanced Forest Productivity Workshop - Summary

October 15-17th 2018

Chapleau, Ontario

Group photo at the end of Day One

Purpose of the Workshop

The workshop was set up to encourage information exchange among participants to better understand:

- Forest ecology and indigenous context on the Martel Forest
- Background and review of the herbicide alternative program (HAP) as a collaborative initiative with indigenous communities
- Relevant and related program and research activity of the MNRF, NRCAN, FPInnovations, and Canadian Wood Fibre Centre

The goal of the discussions is to identify potential synergy with on-going and future activities of the parties.

LIST OF PARTICIPANTS:

Organization	Name
Rayonier Advanced Materials	Chris McDonell Ken Lennon (advisor) Don Bazeley
Wahkohtowin Development Group Inc.	David Flood Isabelle Males
Canadian Wood Fibre Centre	Guy Smith Claudette Trudeau Nelson Thiffault Rob Flemming Paul Hazlett Travis Jones
First Nation Participants	BHFN (Land Mgmt(invited) Isabelle Souliere Dakota Souliere
MNRF	Dave Morris Gord Kayahara
FPInnovations	Dean Assinewe

MONDAY OCTOBER 15TH

6:00 PM - AUX TROIS MOULINS

The workshop began with introductions from all participants in a round table setting followed by a presentation from RYAM outlining the history and implications of the HAP project. The take home messages from that presentation were:

- HAP arose from advocacy of First Nation communities bringing their concerns about herbicides to Tembec.
    - Rayonier Advanced Materials (formerly Tembec) recognises that they source 100% of their raw materials from land they do not own. They desire to reach an agreement with indigenous communities aligning with Free Prior and Informed Consent in order to maintain relationships.
- As useful as herbicides may or may not be, the goal of the forest industry is to develop and regenerate forests in the best way possible – with scientific, economic and socially responsible practices.
- HAP 1.0 resulted in a 75% reduction in active ingredient applied in the Chapleau Crown Game Preserve between 2007 and 2017.
- HAP 2.0 aims to explore more ways to apply silvicultural practices that are conducive to HAP, such as:
    - Modified mechanical site preparation
    - Larger tree seedlings
    - Pre-assessment surveys
    - Timing of renewal treatments

TUESDAY OCTOBER 16TH

FIELD TOUR 8:30 AM – 5:30 PM

STOP 1- BLOCK 372 – NEW HAP AREA

Jack Pine – Aspen Mixedwood stand (MW1) harvested in 2018 at 70-80 years of age, primarily a full tree operation with delimbing at roadside. The soils on the site were finer textured silt to fine loamy sands with no heavy duff layer. Currently planned to be planted at low density with **larger stock** white spruce with no site prep.

Discussion

- Majority conifer was taken from the site, due to the mill needing conifer. However, management needs to happen on an ecological basis and the site will be restored as MW2 to simulate the range of natural variation on a landscape level. It is up to the mill to modernize production to increase lumber output with the same amount of conifer input.
- Due to the lack of duff layer, site prep is not needed to plant the seedlings directly into the mineral soil. It is assumed that hardwoods will regenerate naturally on the site. Site prep activities would encourage Aspen suckering and increase light and nutrient competition with the planted conifers. If no action was taken after harvest, the site would likely regenerate to a hardwood dominated stand. Planting large stock conifer seedlings gives them a competitive advantage, and they are more likely to reach their potential creating a mixedwood stand.

STOP 2 – BLOCK 143 – FIRST HAP SITE

Pure Jack Pine (PJ1) stand commercially thinned in 1993, harvested in 2012, site prepared with disc trenching in 2013, planted in 2014, followed by infill planting and aerial seeding 2015-2016, declared Free to Grow in 2017. Dry soils that are favourable to Jack Pine, and adjacent to unharvested PJ1 stands.

Discussion

- If the site didn't require tending is it really HAP? It serves as a good demonstration of the art and science required for successful regeneration. Declared a successful HAP site to be used as a benchmark for HAP sites using different regeneration methods.

- The infill planting and aerial seeding were the result of poor seedling quality leading to higher than average mortality.
- Average treatment costs for the Martel Forest:
    - Spray - $125/ha (plus an overhead cost of ~10%)
    - Seeding - $35/ha
    - Planting - $260/ha
    - Pre-Commercial Thinning - $500+/ha
    - Mechanical tending - $1000+/ha
- Is there the ability to identify potential HAP areas with GIS technology? Currently, not really. However, in the future digital soil mapping will be available from elevation models and soil moisture regimes derived from LiDAR (anticipated in December). This will allow for management plans to stratify blocks based on soil type. This is more of an ecosystem-based approach than using dominant tree species, which is what is currently done in Forest Management Plans (FMPs).

STOP 3 – BLOCK 144 – NOT SELECTED FOR HAP

Left side of the road has been treated with aerial herbicide spray, right side has not.

PJ1 stand harvested in 2012, site prepared with a disc trencher in 2013, planted in 2014, sprayed with 1.8 kg/ha of active ingredient in 2017.

Discussion

- This block was not chosen for HAP because it had a higher understory productivity than block 143. It was originally considered for HAP however based on a pre-harvest assessment (i.e. ground survey) it was dropped. . It was determined that due to the higher productivity of the site it would become a hardwood dominated mixedwood stand without spray. Spraying this site encourages the pre-existing PJ1 stand to be replaced.

STOP 4 – BLOCK 376 – SITE PREP TRIALS

Light pressure trenching trial.

This area was site prepared in 2017 and planted in 2018. Disc trenching was done at light, medium, and regular ground pressure in separate areas of the block. Establishment plots were established to compare seedling productivity and growth between the different site prep treatments.

Discussion

- Light pressure disc trenching may be better for cone distribution without burying them.
- All survey sites are GPS marked, as well as marked with pins and flags.
- On the drive to the block, piles of unmarketable white birch were observed left on site to rot after harvest. It was suggested in the future to let surrounding communities know about these piles before they rot, since they are so close to the roadside and easily collected for firewood.

STOP 5 – BLOCK 383 – RECENT SITE PREP

PJ1 stand harvested in 2017 and site prepared with a 3-row disc trencher using regular ground pressure less than 24 hours ago. Plant planned in 2019.

Discussion

- When there is not a thick duff layer, is the deep trenching really necessary? Would it have been possible to not site prep this area and save money? More research needs to be done (similar to the pressure research from the previous stop in block 376) to determine when site preparation is necessary. As noted in discussion at Stop 1, site preparation can encourage the growth of competitor species which leads to the need for tending.

STOP 6 – BIRCH SHACK

Tour inside of the Wahkohtowin mobile birch syrup sugar shack.

STOP 7 – BIRCH FOREST

Tour of the birch stand where sap is collected to be turned into syrup.

Discussion

- Potential to look into Non-Timber Forest Product (NTFP) development in future forest management.
- Harvesting of NTFPs cannot be done when spray has occurred. This is motivation for HAP to continue reducing the amount of area sprayed.
- It is important to identify indigenous values present in a block, including NTFPs, **before** creating the spray plan in order to maintain relationships.

STOP 8 – BLOCK 221 – NO SPRAY

Block was harvested in 2013, site prepared in 2014, planted in 2015. The majority of the block was planned to be sprayed to return it to a conifer dominated state. However, the block is in close proximity to the Mountbatten reserve which is part of Brunswick House First Nation, and they requested that RYAM not apply any spray to the block.

Discussion

- There are still many conifers visible on the site, in the presence of competition reduced growth initially is usually a bigger problem than mortality. Diameter growth of the seedlings is already affected at this point. Based on previous studies conducted in the Chapleau area it is unlikely that the conifer will survive when the stand is 15+ years old.
- This could be good timing to try out a manual treatment with brush saws as an alternative to spray. There are concerns about the impact of the exhaust fumes on the health of the workers. Due to the aspen present on the site brushing would probably need to be done twice. Is there a trained workforce available?
- Fertilizers could have been another treatment option. This would be difficult, as they would first have to undergo an environmental assessment. Not the best solution for this particular site, as light is the limiting factor to growth and not nutrient availability.
- There is an opportunity here for everyone to learn about the science and art of forest regeneration.

Wednesday October 17

Research Sites Tour 8:30 AM – 1:30 PM

Stop 1 – Soils (LTSP)

This site has been operating since the 1960s, and the purpose is to determine the impacts of harvesting on productivity, nutrient removal, and compaction. The study focuses on three different treatments – full-tree harvest, tree-length harvest, and blading in fire origin stands. Fire origin stands have a large layer of forest floor which contains Phosphorus, Potassium, and Nitrogen, this is a highly productive environment for Jack Pine.

Over the course of 25 years the study has found that there is no significant difference in total soil reserves of C, N, P, Ca between full-tree and tree length-harvesting. This is true across the Long-Term Soil Productivity network which includes 14 fire origin test sites across North America. Blading treatments result in an initial decrease of nutrients that never fully recovers to original levels.

Stop 2 – Biomass Harvest Experiment

This experiment explores the potential utilization of slash generated from forest operations using full tree bio-harvest. Roadside slash and unmerchantable trees can be ground into biofibre which can then be brought to a cogeneration facility like the co-gen plant in Chapleau. There they are burned as an energy source. Normally the ash by-product from this process is disposed of in a landfill, but this study is testing the effects of using the wood ash as a fertilizer for forestry plantations.

Although some nitrogen is lost in the burning process, the ash contains phosphorus, potassium, calcium, and magnesium that encourage sapling growth. Studies are being done on ash impacts on soil, growth, soil water content, biodiversity, and microbial communities.

For more information, Natural Resources Canada, Canadian Forestry Service, and the Great Lakes Forestry Centre published an early results report in 2016. Available in English, Cree, Ojibwa, and French.

OUTCOMES

The goal of the workshop was to encourage discussion around the topic of regeneration method alternatives to the use of chemical spray. This was accomplished over the course of the workshop, and the following next steps were identified:

- Continue long-term research exploring methods of improving regeneration such as:
    - Planting larger seedlings
    - Different ground pressures of disc trenching
    - Cut-to-length vs full-tree harvesting
    - Using ash or other fertilizers
    - Mechanical brushing techniques
- Look into new technologies that use soil characteristics to map forest units with a more ecosystem-based approach.
- Engage local communities, including Brunswick House First Nation within their areas of interest, for input on blocks before they are harvested as well as a potential work force for mechanical brushing.
- General agreement among participants to meet again in the near future to discuss thoughts generated by the workshop and next steps.