

Potential Implications of Beetle-related Timber Salvage on the Integrity of Caribou Winter Range

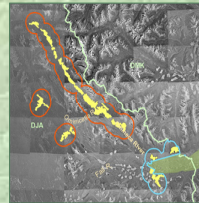
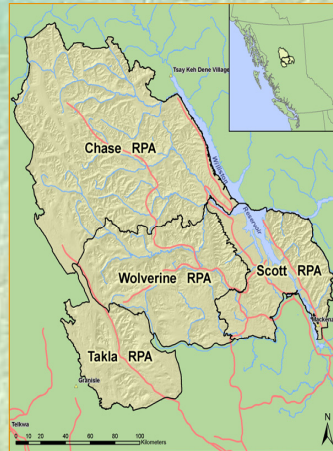
Mountain Pine Beetle, Forestry, and Ungulate Winter Ranges



- Woodland caribou depend on pine-dominated forests.
- Forestry activities can also be strongly dependant on pine-dominated forests.
- Within caribou ranges there is a potential conflict between UWR management and the implementation of forest policy.
- We evaluated 4 scenarios of forest policy to compare the amount of caribou winter range impacted by different harvesting patterns, and to determine if UWR strategies for caribou constrained timber supply.

Scenarios

- **Base Forest Management Scenario:** This scenario was based on harvest patterns in a pre beetle landscape. There were no restrictions to harvest only pine but within legislated UWRs, a strategy to ensure 50% of UWR areas were available as useable winter range was put into effect. Usable UWRs were pine-lichen woodlands between 70 and 140 years of age.
- **Salvage by Exploiting Existing Infrastructure:** This scenario placed an emphasis on salvaging dead pine during the salvage period. The only constraints on salvage were that the stand needed to conform to TSA timber salvage criteria and did not require the construction of more than 1km of new road to access the stand to be harvested.
- **Enforced Pine Salvage:** In this scenario, we placed the same emphasis on pine salvage as in scenario 2 but we relaxed the access constraints to allow roads of up to 30km to be built in order to access beetle-killed timber. This scenario also allowed harvest to occur in the UWRs with no constraints during the salvage period.
- **Enforced Pine Salvage with AAC uplift:** This scenario was identical to scenario 3 except AAC was increased over its current level by 40% for the duration of the salvage period.

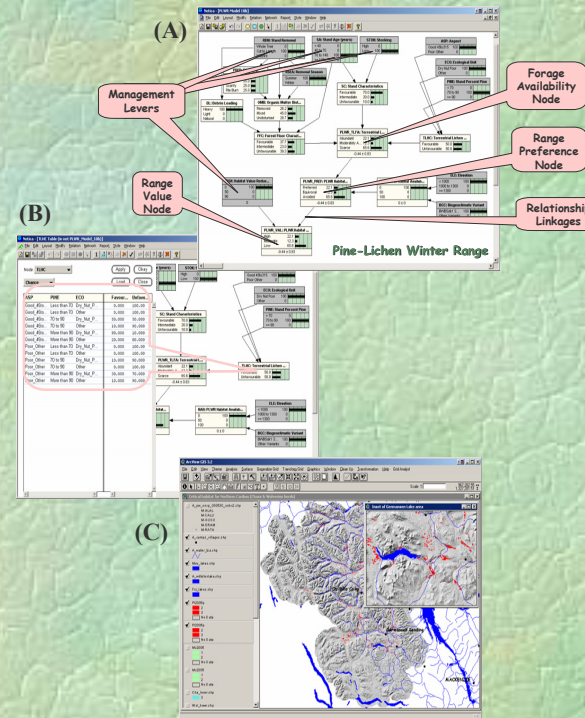


Example UWRs in the Fort St. James District

The Caribou Habitat Assessment & Supply Estimator

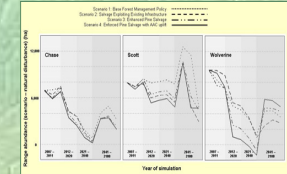
Bayesian Belief Networks are models that consist of nodes and linkages. Nodes are represented by environmental correlates, disturbance factors, and response conditions. Linkages are the conditional probabilities that describe relationships among nodes.

- (A) Model 4 seasonal ranges & predation risk
- (B) Establish conditional probability for relationships
- (C) Apply data, calculate range (sum of P*E(x)), stratify & map

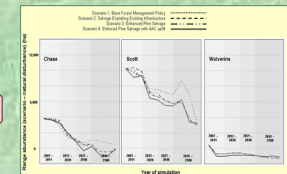


Modeling Results

Caribou Range

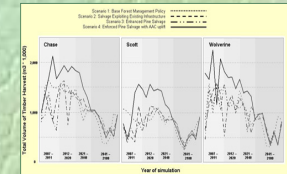


- Winter range abundance can be maintained above natural levels in all herd areas.
- Scenarios that do not maintain at least 50% usable UWR result in conditions less desirable than conditions found under a natural disturbance regime.



- Predation effects on winter range have an extreme impact on the value of winter habitat.
- Predation effects are enhanced by roads and early seral stands which will be abundant in an MPB salvage dominated landscape.

Timber Supply



- Timber volume resulting from MPB mortality exceeds the requirements of all scenarios.
- Wood quality issues of MPB attacked stands are the primary factor driving post-salvage harvest volumes.

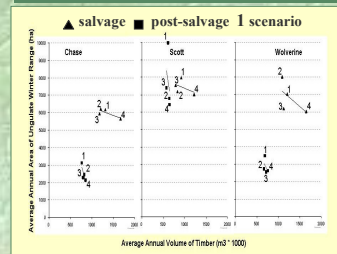
Management Recommendations

- An important component of range conservation will be to develop harvest patterns that minimize the influence of predation.
- Our results indicate licensees can meet fiber requirements without dealing with UWR legislation. If licensees do not undertake activities in UWRs, restoration strategies will need to be developed by government.

Highlights

- Salvage of MPB attacked pine does not have to degrade the abundance and quality of northern caribou ungulate winter ranges.
- Maintaining caribou range does not have to unnecessarily restrict timber supply.

Winter Range vs. Timber Supply - Tradeoffs



- Tradeoffs between timber supply and caribou range have generally been considered direct conflicts.
- Our summaries indicate otherwise.
 - During the salvage period, uplifts to harvest levels show limited impact on the amount of caribou habitat impacted;
 - During the post-salvage period, maximizing habitat values for caribou has relatively low impacts on timber supply.

Credits

- Funding: FIA Forest Science Program
- Technical:

- Scenario implementation - Andrew Fall
- Resultant data management - Rob McCann
- Project implementation - Scott McNay, Randy Sulyma, Viktor Brunovsky, Joan Voller



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