Swamp Conifer

Project Subject/Title: Northern White Cedar Site Prep Treatments

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Abstract:
The study area is located in the Brule Bog of the Brule River State Forest in eastern Douglas County. The site preparation techniques were randomly assigned to 3 clearcut units. The site preparation techniques included slash removal by broadcast burning, full tree skidding, and full tree skidding leaving the slash behind. The units were clearcut in the winter of 1979-80. The skid treatment equipment used was a rubber tired skidder. The leave treatment left slash in place. In the burn treatment slash was evenly distributed with slash free alleys. Density of cedar, balsam fir, and black spruce was sampled at 3 and 5 years and again in 2014. Regeneration was sampled on fifty 4 meter plots for each treatment. Seedbed types were defined and vegetation was sampled. Hare, deer and rodent enclosures were established.

Trial Location:

County: Douglas

Township: 45N **Range:** 11W **Section:** 08

GPS Coordinates: Lat: 46°23'55.26" **Long:** -91°45'43.56"

Property Name: Brule River State Forest

Baseline Stand Data

- *Cover Type:* Swamp Conifer
- *Acres:* 6.375
- *Habitat Type:*
- *Soil Type:* Seelyeville and Markey
- *Year of Origin:* 1980
- *Total Height:*
- *Site Index Species and Site Index:* 30-42
- *Mean Stand Diameter:*
- *Total Basal Area per Acre:* 160 sq.ft/acre
- *Other stand Condition:*

Prescription and Methods:

- *Type of Prescription:* Site preparation
- *Year Initiated:* 1980
- *Establishment Methods:*

Three clearcut units were selected for the site preparation treatments (each unit had a different site preparation method) and were separated by two uncut units. Harvesting was conducted in the winter of 1979-80. All stems that were greater than 2 inches in DBH were cut.

The “Skid” treatment used a rubber-tired skidder, and slash was burned progressively at the landing. The “Leave” treatment left slash in place. One the “Burn” treatment, slash was left evenly distributed between 32.8 feet wide slash-free alleys and burned in July 1980 under fairly severe conditions.
To study the effects from animal browsing, deer, hare, and rodent enclosures were made in areas with cedar regeneration.

- *Data Collection Methods:*

Regeneration surveys were sampled in fifty 4-meter plots 3 and 5 years after the treatments took place. A follow up regeneration survey was taken in 2014. In addition to the regeneration surveys, the browsing protection treatments were also looked at and measured.

Results:

Prior to 2014- All seedbed types (Burn-type bryophytes and Sphagnum moss) were adequate to produce enough seedlings to regenerate a fully stocked cedar stand. Burning increased the frequency of the burn-type bryophyte seedbed while skidding increased the frequency of sphagnum moss. The burned treatment had the highest density of northern white cedar among the different sit prop methods. Burning, however, eliminated most of the advanced conifer regeneration.
Severe browsing on northern white cedar was documented throughout the study. Deer were the main herbivores, however, hare and other rodents contributed to the damage as well. Balsam fir took advantage of the reduced competition and increased in all treatments. All exclosures were beneficial in protecting regeneration of northern white cedar.
2014- There was no cedar regeneration observed in the cut or uncut strips except for in the animal exclosures. Balsam fir (643 stems/acre) and black spruce (500 stems/acre) were the most abundant regenerating species. A lot of the balsam fir and black spruce were around 3 to 4 inches at DBH. Tag alder and occasionally willow were abundant throughout the stand. Deer browse was observed on some of the regeneration.

Discussion/Recommendations:

Although there was white cedar successfully regenerating inside of the animal enclosures, it is not practical to establish white cedar regeneration throughout the entire stand with this method. An alternate strategy must be utilized to protect white cedar regeneration from the deer, hare and rodents. Climatic factors can also influence the success of cedar regeneration i.e. maintaining a moist seedbed. A suggested silviculture treatment is to clearcut small patches of cedar located adjacent or close to each other over a period of 5-10 years so eventually the entire area is completely cut. This method assumes that the deer would avoid the center of the clearcuts due to lack of cover thus thwarting browsing.