

EFFECT OF SLASH ON ASPEN REGENERATION
(WINTER CUT) HUDSON BAY, SASKATCHEWAN

Demonstration MS-1

by

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INTRODUCTION

Field observations, made in November 1965, indicated that the restocking of cut-over trembling aspen (Populus tremuloids Michx.) stands near Hudson Bay, Saskatchewan may have been reduced by the presence of an unmerchantable residual overstory and the accumulation of logging slash on the ground. In order to test the validity of these observations a co-operative project between MacMillan Bloedel Saskatchewan Limited and the Department of Forestry and Rural Development was undertaken to test the effect of residual crown canopy and slash disposal on aspen regeneration.

The study area was prepared during the winter of 1965-1966 in a mature trembling aspen stand located on a clay loam soil and averaging 167 (range 165-169) square feet basal area per acre (Figures 1 and 2). Chain saws and wheeled skidders were used to prepare four strips as follows:

- Strip 1: Control. Normal logging practices, i.e., tops lopped and left where they fell, non-commercial trees left standing.
- Strip 2: As in (1) except trees skidded out with tops still attached.

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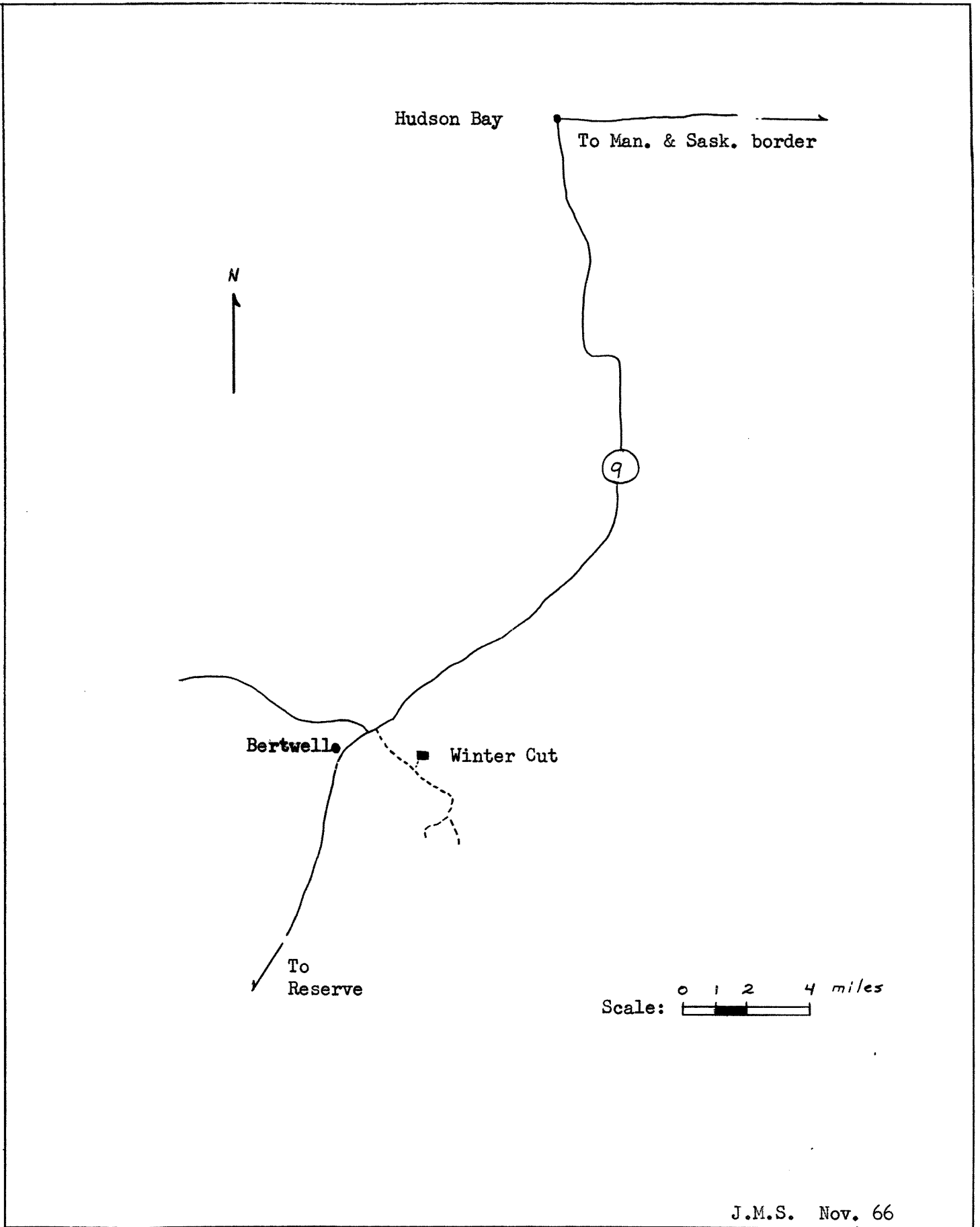


FIGURE 1: Experimental Area - Winter Cut
Hudson Bay, Saskatchewan

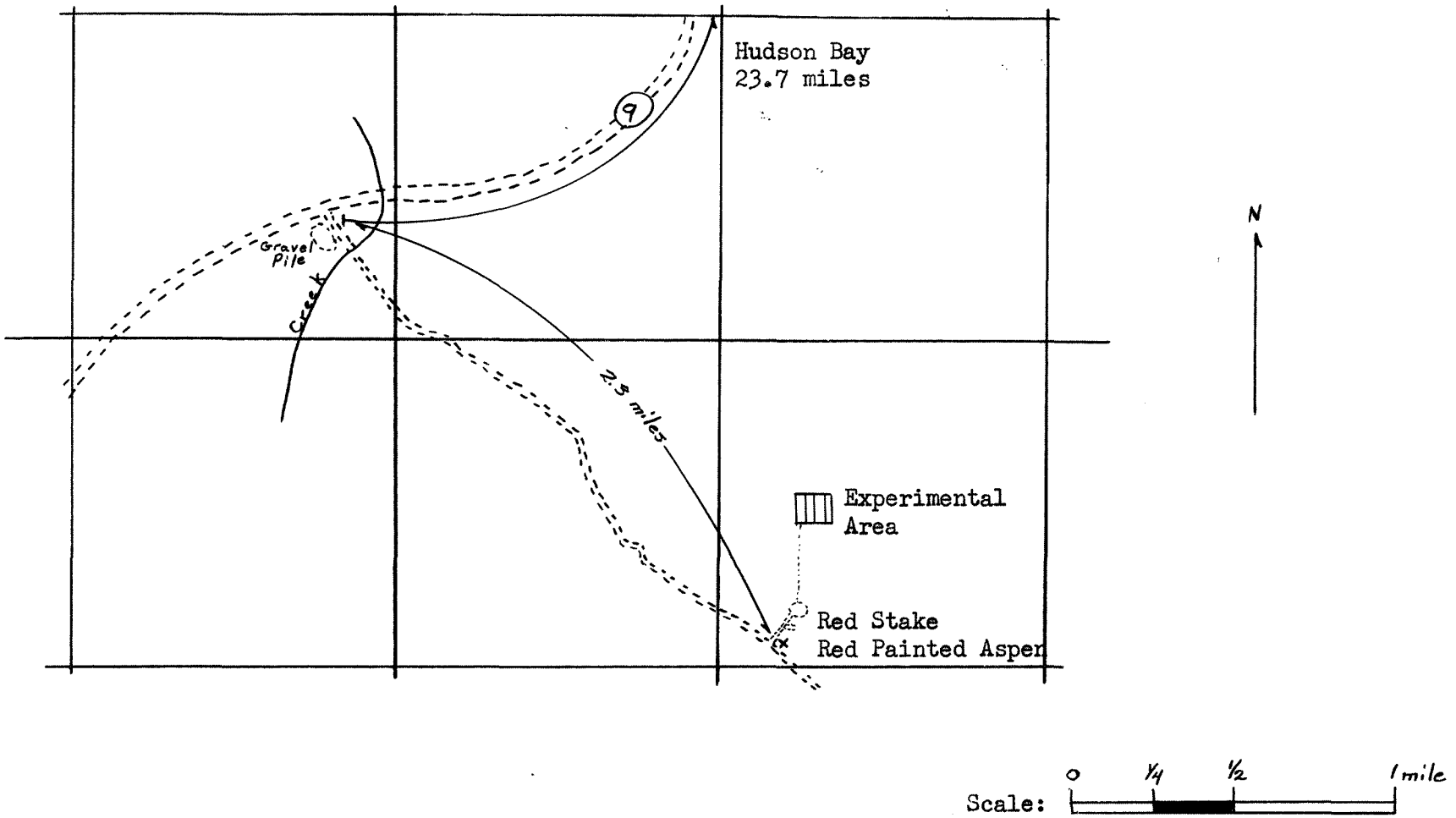


FIGURE 2: Location of Experimental Area, Winter Cut, Hudson Bay, Saskatchewan

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- Strip 3: As in (1) except non-commercial trees were felled, though not removed from the area.
- Strip 4: A combination of (2) and (3), i.e., non-commercial trees were felled, and all trees were skidded out with their tops on.

The adjacent strips, each 5 x 2 chains, were located on an area approximately 8 x 5 chains. Strip one was disregarded, because logging had not been completed and because of a dense stand of 30-35 foot high spruce growing on it (Figure 3).

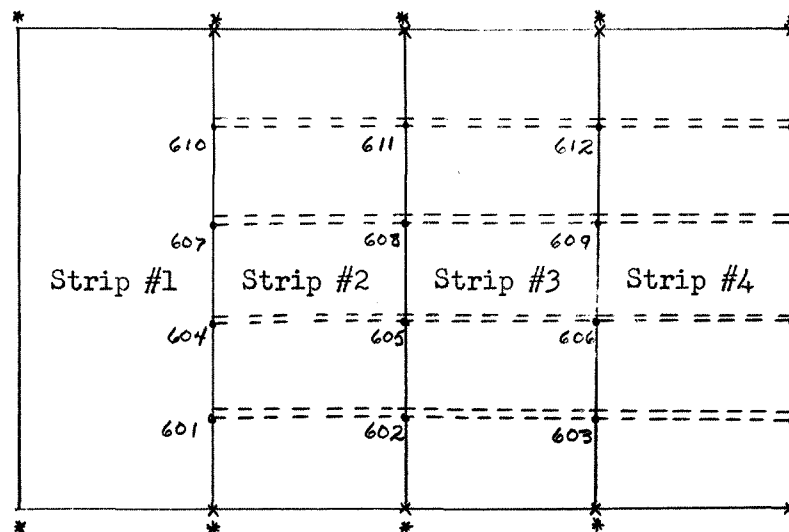
Previous observations had indicated that past clear cutting operations resulted in a residual stand of 30-40 trees per acre. On this cutting area a higher utilization standard left only one tree per acre (2.8 square feet per acre). As a result, no measure could be made of the effect residual over-story has on regeneration but only the effect of removing slash. It would appear that in future operations clear cutting rather than partial cutting will be the rule.

FIELD WORK

The corners of the three cutting strips were marked using red wooden stakes 2" x 2" x 5'. Four hundred and eighty sample quadrats, each 1/2000-acre, 3.3 ft. E-W and 6.6 Ft. N-S, were established by laying out four lines two chains long, one chain apart running east-west through each cutting strip (Figure 3). Each quadrat was classified as to moisture regime, and a total count was made of the number of trembling aspen and balsam poplar (Populus balsamifera L.) suckers, sprouts and advanced growth. The height of the tallest of each species and type was taken on each quadrat. All stumps inside the quadrats were measured to determine the basal area per acre on each strip prior to treatment. In addition, limbs and the presence of logs (trees felled in the cutting operation) and trees left standing were noted in order to determine the effect these had on regeneration.

Twp. 41, Rge. 4, Sec. 34, W. 2

Strip	Row No.	Treatment
#2	601-604 607-610	Normal Logging Trees Skidded With Tops Attached
#3	602-605 608-611	Normal Logging Non-Commercial Trees Felled Left on Area
#4	603-606 609-612	Combination Strip #2 and #3 All Trees Skidded Out With Tops



Legend

- Stakes Red 1.5' _____.
- Stakes Red 3' _____x
- Stumps 4'-5' Red Blaze ___*



Scale: 0 1/2 1 2 chains

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FIGURE 3: Layout of Experimental Area - Winter Cut, Hudson Bay, Saskatchewan

RESULTS

Slash Conditions

The occurrence of logs and limbs on the area gives some indication of whether the slash disposal treatments made a difference. Table 1 shows that the strips actually did not differ too greatly. Strip 3 had the most limbs while strip 4 had the most logs. According to the cutting methods, strip 3 should have had the most logs and strip 4 the least limbs and logs (Table 1).

TABLE 1

DISTRIBUTION OF SLASH FOLLOWING THREE CUTTING AND SLASH DISPOSAL TREATMENTS¹

Strip No.	Slash Distribution (% of quadrats)				Basis: Number of Quadrats examined
	Limbs (%)	Logs (%)	Limbs or Logs (%)	Nil ² (%)	
2	42.4	36.7	65.5	34.5	139
3	53.5	40.6	76.2	23.8	101
4	43.1	54.4	78.1	21.9	160

¹Wet site excluded (80 quadrats)

²Nil - no limbs or logs on quadrats

Regeneration

All treatments resulted in nearly full stocking but there were approximately 8,000 more aspen suckers on strips 2 and 4. Aspen suckers grew best on strip 2, second best on strip 4 and poorest on strip 3 (Table 2).

Effect of Slash on Regeneration

Results clearly indicate that regeneration was better when slash was absent, however, slash conditions did not affect height growth (Table 3).

Insect Damage

It was noted when examining the area that a small percentage of the aspen suckers were dead or dying. Laboratory examination showed that the affected suckers contained larvae of the long-horned woodborer, Saperda (possibly calcarata).

Advanced Growth

Most of the advanced growth was damaged in the logging operation and only future remeasurements will show if it can recover and grow into merchantable trees. At present the advanced growth is approximately one foot taller than the regeneration (Table 4).

FUTURE WORK

In the summer of 1967, the regeneration quadrats established on the winter cut will be examined. Observation and examination of the summer cut will be carried out when the area becomes available.

It is proposed to remeasure the quadrats until the suckers are five years old.

SUMMARY

Abundant aspen regeneration was obtained on all treated areas and under all slash conditions, but results indicated that slash does reduce suckering.

TABLE 2

EFFECT OF CUTTING AND SLASH DISPOSAL METHODS ON REGENERATION¹

Strip No.	Per Cent Stocking ² and Number of Suckers or Sprouts per Acre						Av. Height of Tallest Sucker or Sprout on Each Stocked Quadrat		Basis: Number of Quadrats Examined
	Trembling Aspen (%)	Balsam Poplar (%)	Both (%)	Trembling Aspen (No.)	Balsam Poplar (No.)	Both (No.)	Trembling Aspen (Ft.)	Balsam Poplar (Ft.)	
2	99.3	4.3	99.3	26,288	561	26,849	3.5	2.1	139
3	93.1	14.8	93.1	16,376	1,644	18,020	2.9	2.3	101
4	98.8	24.4	99.4	22,025	3,512	25,537	3.3	2.4	160

¹Wet site excluded (80 quadrats).

² 1/2000-acre quadrats.

TABLE 3

EFFECT OF SLASH ON REGENERATION¹

Slash Condition	Number of Suckers or Sprouts per Acre			Av. Height of the Tallest Sucker or Sprout in each Stocked Quadrat		Basis: Number of Quadrats Examined
	Trembling Aspen (No.)	Balsam Poplar (No.)	Both (No.)	Trembling Aspen (Ft.)	Balsam Poplar (Ft.)	
Limbs	19,000	1,967	20,967	3.3	2.2	182
Logs	20,559	2,592	23,151	3.2	2.4	179
Limbs and Logs	18,353	2,706	21,059	3.2	2.2	68
Nil	27,401	1,570	28,971	3.3	2.2	107

¹Wet site excluded (80 quadrats).

TABLE 4

STOCKING OF ADVANCED GROWTH¹

Species	Stocking ²		Average Height of the Tallest Sucker or Sprout in each Quadrat Examined (Ft.)	Basis: Number of Quadrats Examined
	Per Cent	Number of Suckers or Sprouts per Acre		
Trembling aspen	29.8	940	4.4	400
Balsam poplar	1.8	40	3.1	400
Both	31.2	980		400

¹Wet site excluded (80 quadrats)

²1/2000-acre quadrats