RECOVERY AND PROCESSING OF LOGGING RESIDUE

ON STEEP TERRAIN IN NORTHERN IDAHO

A Thesis

Presented in Partial Fulfillment

of the Requirements for the

Degree of Master of Science

In Forest Products

in the

GRADUATE SCHOOL

UNIVERSITY OF IDAHO

By

Eric S. Verner

November, 1983

ACKNOWLEDGEMENTS

I would like to first thank Professor Leonard Johnson for his administration of this project and for his invaluable advice and critique of this report. Thanks also to the U.S. Forest Service for their project support. I would also like to thank many others who helped me throughout the project. Professor Harry Lee for his advice during field work and report writing. Harold Osborne for serving on my committee. The University Of Idaho Experimental Forest for “in kind” contributions of study sites and other invaluable help during the field season. Mick Koppang and others at the CPTPA for letting us study the shear and for their dedication during the field study. And thanks to the members of the RDF; Jack Gilbert, Bob Kolva, Mark Sherman, Vaden Bloch, Bert Willie, and Bob Rummer, for their dedication during data collection and analysis.

Finally, special thanks to my wife, Alice, for her caring support and patience through all the long working hours and times spent apart during the project. Also special thanks to all of my family for their support and guidance that gave me the confidence to carry this project through to the finish.

ABSTRACT

Logging residue recovery in steep terrain was tested using a small wood yarder, the Christy Yarder, to concurrently yard sawlogs and logging residue and a wheeled skidder to shuttle material to a remote landing. Residue processing was tested with a wood shear – firewood processor. The shear used a hydraulically operated knife to chop residue pieces into firewood lengths. A hydraulic loader fed the shear. Although the shear was tested on gentle terrain the operation would work well in steep terrain because of the linear arrangement of equipment.

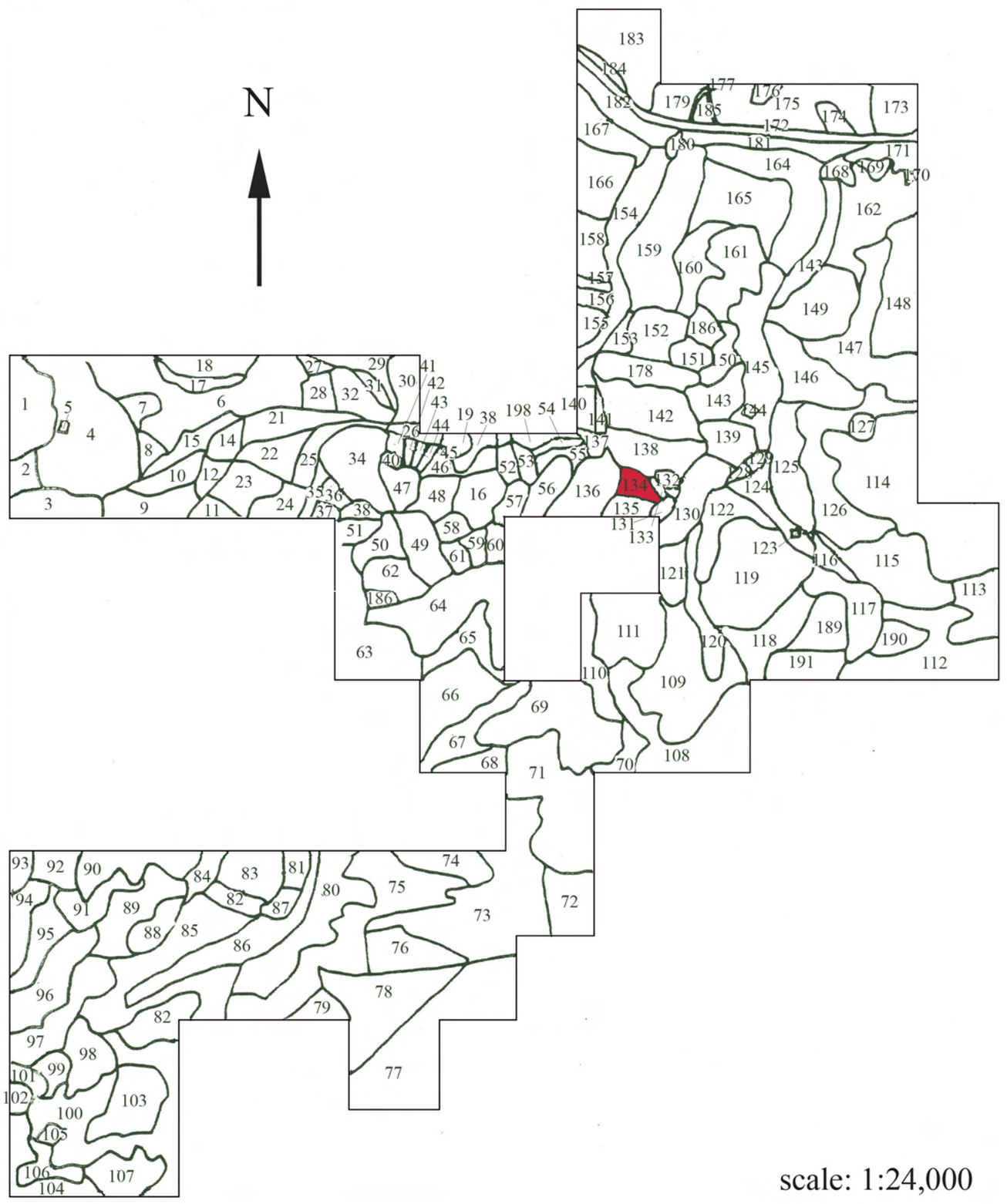
Results of the two field studies were used to simulate combined operations of the yarder and shear in various operating modes that included operation of the shear and loader at the yarder location.

Results indicate that the yarder can effectively remove sawlog and residue pieces concurrently. The yarder productive turn was not influenced by the residue pieces in turn. Imbalanced production between the yarder and skidder did, however, create delays at the yarder because the yarder waited for the skidder to clear the yarder landing deck. Skidder production was directly impacted by residue recovery with the extra time spent piling residue pieces and maneuvering at the landing. Total residue recovery costs ranged from $10.75 to $22.85 per green ton of residue recovered. The net value of…..

Study Site

The study took place on the University of Idaho Experimental Forest, in the unit with the common name of "Postage Stamp", and either stand number 1422 or 1423.

Stand Map of the Flat Creek Unit, College of Forestry, Experimental Forest 1986



By finding the stand number, on the table for the map, you are able to then find the stand on the map an see where the research took place on the experimental forest. For this research we located work done by the Christy Logger in 1983 to find its location.
This map and table came from *A Combined Report For Fiscal Years 1980 Through 1986*

By
Forest Manager,
Harold Osborne
The maps were edited by
Rachel Voss

Table 6-1. Continued

STAND #	MAP #	STAND DESCRIPTION	HARVEST ACRES	HARVEST ACTIVITY CODE	FY HARVEST	SLASH/ SITE PREP CODE	FY PREP	REFOREST CODE	FY REFOREST	LOGGING METHOD
10206	191	CLEARCUT	8	CC	83	DP&B	83	P	83	G
10209	117	TRIANGLE OVERSTORY REMOVAL	2	SHWD-R	83	L&S	83			G
10401	132	LOW THIN DEMO	1	T	83					
10413	45	FIREWOOD THIN PILOT	1.1	LT	83	L&S	83			
10419	53	BIOMASS CLEARCUT	5	CC	83	BB	83	P	83	C
10420	52	BIOMASS SHELTERWOOD	5	SHWD	83	L&S	83	NR	83	C
10421	133	POSTAGE STAMP CLEARCUT	1	CC	83	BB	83	NR	83	C
10422	134	CHRISTY SHELTERWOOD	5	SHWD	83	DP&B	83	NR	83	C
10438	131	SHELTERWOOD ADJ. POSTAGE STAMP	1	SHWD	83	DP&B	83	NR	83	G

TABLE 6. AN EXPLANATION OF CODES USED IN TABLES 6-1 AND 6-2.

HARVEST ACTIVITY CODES

CC - CLEARCUT
SHWD - SHELTERWOOD
ST - SEEDTREE
SE - SELECTION
T - THINNING
LT - LOW THINNING
N - NO HARVESTING
IMP - IMPROVEMENT CUT
P - CUT PRIOR TO FY80

REFORESTATION CODES

P - PLANTED
NR - NATURAL REGENERATION
IP - INTERPLANT

SITE PREPARTAION CODES

BB - BROADCAST BORD
DP&B - DOZER PILE AND BURN
L&S - LOP AND SCATTER
JPB - JACKPOT BURN
HPB - HAND PILE AND BURN

LOGGING METHOD CODES

C - CABLE LOGGING
G - GROUND SKIDDING
H - HORSE LOGGING

Date: 15 APRIL 1985

Reseacher/s: Johnson, Leonard and Eric Verner (CRISTY)

Project Title: Concurrent Recovery of Sawlogs and Residue with a Cristy Yarder.

Subject: Residue recovery with cable logging
Keywords:
Abstract: A small wood yarder was used to recover sawlogs and slash from two small clearcuts and a shelterwood. Material was moved from the yarder to a separate landing with a skidder. Production and time studies were conducted.

Location:
Unit of the Forest Flat Creek
T _____ R _____ S _____
Stand _____ Size of Area _____
General Description of Area _____

Plot or Area Designation: _____

Date Begun: 1982 Summer Completion date (expected) 1982
Papers or Thesis Resulting:
M.S. thesis Eric S. Verner Nov. 1982 UI "Recovery and processing of logging residue on steep terrain in northern Idaho"

Funding Source: USFS INT Experiment Station

Future Plans:

Location of Complete Research:

Author & Title: Verner, Eric S.
Recovery and Processing of Logging Residue on Steep Terrain in Northern Idaho

University of Idaho Library:

Call Number- SD544.V47

College of Natural Resources:

Department- Forest Products

Other Sources: