



Minnesota Forestry Research Notes

No. 286
April 1983

FORESTRY INCENTIVES PROGRAM INVESTMENTS IN 1974: RETENTION THROUGH 1981 IN THE NORTH*

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ABSTRACT

The Forestry Incentives Program is designed to stimulate investments on nonindustrial private forest land. The federal government shares in the cost of noncommercial treatments on private forest land. In order for the program to be effective, the investments must reach economic maturity. The investments made during the 1974 program year were sampled in 1981 to determine the percentage of treated acres that have been retained.

In the North, the sample represented 9 percent of the total acres treated in 1974. The retention rate for the sample was 96.5 percent. Of the total treated acres lost, 35.5 percent had been replanted or interplanted. Drought and insect and disease problems were the primary factors in the loss of treated acres. The high level of retention provides support for the contention that the loss of the treated acres is not a significant problem.

INTRODUCTION

In an era of limited public finances and concern over public program efficiency, public monies must be invested in an efficient manner and must produce outcomes that achieve desired objectives. Public funds invested in forestry programs are no exception. The Forestry Incentives Program, designed to encourage intensified management of nonindustrial private forests is an example. Its efficiency and effectiveness have been analyzed for two program years, 1974 and 1979 (Mills and Cain, 1978; Risbrudt and Ellefson, 1983). As part of a continuing effort to assess the program's success, the acres cost-shared in 1974 were evaluated in 1981 to determine if the for-

estry practices carried out in that year were still remaining and, if lost, to determine the cause and extent of loss. This note presents the results of that assessment for the northern region of the United States.

THE FORESTRY INCENTIVES PROGRAM

The Forestry Incentives Program was congressionally established in response to concern over the level of investment focused on the management of the nation's nonindustrial private forests. In the north, nonindustrial forest landowners control 69 percent of the commercial forest land (USDA-Forest Service, 1982). Since implementation of the program in 1974, the federal government has shared 50 to 75 percent of the cost of noncommercial forest treatments such as planting and timber stand improvement. To be eligible for the program, an owner of nonindustrial private forest must:

- Own no more than 1,000 acres of commercial forest land, unless the Secretary of Agriculture determines it is in the public interest to grant an exception for a larger acreage limit not to exceed 5,000 acres. A ten acre minimum tract size for reforestation was set in 1977.
- Have land capable of commercial forest production, defined as land that can produce at least 50 cubic feet of timber per year.
- Be a private forest landowner. Any individual, group, association, or corporation whose stocks are not publicly traded is eligible, provided they are not primarily in the business of manufacturing forest products or providing public utility services of any type.

*Research supported by Cooperative Forestry, State and Private Forestry, USDA Forest Service, Washington, D.C.; and Agricultural Experiment Station and Department of Forest Resources, St. Paul, MN.

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The program is jointly administered by the USDA-Forest Service, the USDA Agricultural Stabilization and Conservation Service (ASCS); and the individual State Foresters. The Forest Service is responsible for establishing the program's technical standards while the ASCS is responsible for administering the applicant approval process and the disbursement of cost-share payments. The State Foresters provide technical forestry assistance to the landowners and certify completion of practices according to specifications.

STUDY DESIGN AND SPECIFICATIONS

The investment cases selected for evaluation of 1974 program effectiveness were the sample cases drawn by Mills and Cain (1978). In the North, a total of 708 cases, representing a sampling intensity of 9 percent, were evaluated in 1981. The number of cases examined in each state in the region follows:

State	No. of Cases	State	No. of Cases
Connecticut	5	Missouri	90
Delaware	2	New Hampshire	47
Illinois	7	New Jersey	14
Indiana	44	New York	47
Iowa	5	Ohio	19
Maine	68	Pennsylvania	84
Maryland	12	Rhode Island	0
Massachusetts	22	Vermont	30
Michigan	104	West Virginia	35
Minnesota	25	Wisconsin	48

Cases were grouped by forest type, acres of treatment and treatment type. Information was collected to determine if the treated stand was still in existence. If a loss occurred, the reason for loss was determined and the acres replanted or interplanted was verified. An official of the county ASCS office contacted forest landowners to obtain information necessary for the evaluation. Gathering information via telephone was permitted if the county official judged the resulting information to be reliable. A field check was carried out where the latter was judged not to be the case.

STUDY RESULTS

Retention of treated acres for the period of time necessary to grow an economically mature crop of timber is essential to the success of the Forestry Incentives Program. Depending on the treatment, the investment period can vary from 5 to 10 years (e.g., release), or be as long as 80 years (e.g., red pine planting). If program investments do not reach their full potential the projected financial returns will not be fully realized. If losses are kept to a minimum, then future benefits of an increased timber supply and a high return on the public investment may be expected (Risbrudt and Ellefson, 1983).

The distribution of sampled acres of tract size was fairly even in the North, i.e., with 22 percent of sampled acres in the 1-10 acre tract size being the largest percentage and 17 percent in the 41-80 acre size being the smallest (Table 1). Eighty-six percent of the treated acres sampled involved timber stand improvement cases while the remaining 14 percent of the sample was taken from cases where planting was the major treatment (Table 2).

Retention Rates

The retention rate of treated acres in the North from the sample of 1974 Forestry Incentives Program cases was 96.5 percent. As exhibited in Table 3, this rate compares favorably with the nationwide retention rate of 93.9 percent. This retention rate also compares favorably with that found for Soil Bank plantings, 86 percent after 15-20 years (Alig, et al. 1980), and the 95 percent rate found for 10 year old Agricultural Conservation Program plantings (Kurtz, et al. 1980). This high level of retention, 7 years after treatment, supports the contention that losses of treated acreages may not be a significant problem with the use of public incentives to promote private forestry.

Bare land planting and timber stand improvement treatments (i.e., precommercial thinning, understory release, cull tree removal, and pruning) had retention rates greater than 93 percent but retention of plantings after preparation was only 71 percent (Table 4). All of the major forest types had retention rates of 90 percent or better (Table 5). The largest program segments by forest type were oak-hickory and oak pine. Forty-nine percent of the sampled acres were in these types. The retention rate of each of these program segments exceeded 95 percent.

Causes of Losses

Drought and insect and disease problems proved to be the most significant factors in the loss of treated acres (Table 6). These two factors accounted for 46 percent of the sample acres. Miscellaneous factors accounted for an additional 47 percent of the losses.

Almost three-quarters of all losses were in the 1-10 and 41-80 acre tract sizes, although these groups accounted for only 42 percent of the sampled acres. No losses occurred on tracts of larger than 81 acres even though treatments on acreages of this size accounted for over 20 percent of the sample.

Over 50 percent of the total losses occurred where planting was the treatment (Table 8), but the survival rates were not lower than might be expected on industrial or public forests. Understory release (22 percent) also accounted for a large percentage of the program loss.

Replanting and Interplanting

Of the sample acres that were lost in the North, 28.5 percent were replanted and 7 percent were interplanted. All of the shortleaf-loblolly and two-thirds of the northern pine were so treated. No other forest types were replanted or interplanted. The proportion of treated acres lost, but since recovered, thus totals 35.5 percent. These replantings reduce the percentage of acres that are not currently producing a future timber crop.

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Table 1. Distribution of sampled acres by tract size and forest type in the North. 1981.

Forest Type	Tract Size					Total
	1-10	11-20	21-40	41-80	81+	
	Percent					
White-Red-Jack Pine	7.86	5.41	1.63	2.18	-	17.08
Spruce-Fir	0.87	0.41	0.29	0.58	-	2.15
Loblolly-Shortleaf	0.99	1.31	0.32	0.49	2.71	5.82
Oak-Pine	0.90	1.16	4.48	2.53	12.05	21.12
Oak-Hickory	3.70	6.72	6.72	6.55	4.34	28.03
Oak-Gum-Cypress	a	-	-	-	-	a
Elm-Ash-Cottonwood	0.06	0.20	-	-	-	0.26
Maple-Beech-Birch	7.77	6.63	5.56	4.39	1.22	25.57
Aspen-Birch	a	-	-	-	-	a
All Types	22.15	21.84	19.00	16.72	20.32	100.00 ^b

-/ No samples taken

a/ Less than 0.03 percent

b/ Totals may not equal due to rounding

Table 2. Distribution of sampled areas by treatment and forest type in the North. 1981.

Forest Type	Treatment					Total
	Plant Site Bare Land	Preparation and Plant	Pre-commercial Thin	Under-story Release	Cull Tree Removal Prune	
	Percent					
White-Red-Jack Pine	4.92	4.34	3.40	0.35	-	4.10
Spruce-Fir	1.60	0.09	0.12	0.29	-	2.1
Loblolly-Shortleaf	0.67	2.04	-	1.54	1.54	5.79
Oak-Pine	0.06	a	2.62	7.86	10.56	21.1
Oak-Hickory	0.17	0.35	11.43	1.66	14.14	29
Oak-Gum-Cypress	-	-	0.03	-	-	0.03
Elm-Ash-Cottonwood	-	-	0.20	-	0.06	0.26
Maple-Beech-Birch	-	0.29	17.43	0.64	7.19	25.55
Aspen-Birch	a	-	-	-	-	a
All Types	7.42	7.11	35.23	12.34	33.49	100.00 ^b

-/ No samples taken.

a/ Less than 0.03 percent.

b/ Totals may not equal due to rounding.

Table 3. Percent of 1974 FIP treated acres retained by region and tract size class. 1981.

Region	Tract Size Class (acres)					All Sizes
	1-10	11-20	21-40	41-80	81+	
	Percent					
South	92.9	93.4	92.0	91.0	94.3	92.3
North	94.4	96.9	98.3	92.6	100.0	96.5
Plains/Rockies	86.0	100.0	100.0	100.0	---	96.7
Pacific Coast	92.2	91.4	96.9	100.0	---	94.6
US	93.4	95.3	94.0	91.6	96.4	93.9

Table 4. Proportion of treated acres retained by tract size and forest type in the North. 1974-1981.

Forest Type	Tract Size (acres)					Total
	1-10	11-20	21-40	41-80	81+	
	Percent					
White-Red-Jack Pine	90.8	93.0	100.0	72.6	-	90.0
Spruce-Fir	98.9	100.0	100.0	100.0	-	99.5
Loblolly-Shortleaf	95.1	100.0	100.0	100.0	100.0	99.2
Oak-Pine	100.0	100.0	92.6	75.0	100.0	95.5
Oak-Hickory	92.4	95.7	100.0	100.0	100.0	98.0
Oak-Gum-Cypress	100.0	-	-	-	-	100.0
Elm-Ash-Cottonwood	100.0	100.0	-	-	-	100.0
Maple-Beech-Birch	97.8	100.0	100.0	100.0	100.0	99.3
Aspen-Birch	100.0	-	-	-	-	100.0
All Types	94.4	96.9	98.3	92.6	100.0	96.5

-/ No samples taken.

Table 5. Proportion of treated acres retained by treatment type in the North. 1974-1981.

Forest Type	Treatment						Total
	Plant Bare Land	Site Preparation and Planting	Pre-commercial Thin	Under-story Release	Cull Tree Removal	Prune	
	Percent						
White-Red-Jack Pine	92.9	72.6	99.1	100.0	-	96.7	90.0
Spruce-Fir	99.4	100.0	100.0	100.0	-	-	99.5
Loblolly-Shortleaf	92.9	100.0	-	100.0	100.0	-	99.2
Oak-Pine	100.0	100.0	100.0	90.0	97.7	-	95.5
Oak-Hickory	36.4	72.2	98.6	95.9	98.7	100.0	98.0
Oak-Gum-Cypress	-	-	100.0	-	-	-	100.0
Elm-Ash-Cottonwood	-	-	100.0	-	100.0	-	100.0
Maple-Beech-Birch	-	100.0	99.2	100.0	99.6	-	99.3
Aspen-Birch	100.0	-	-	-	-	-	100.0
All Types	93.6	82.7	99.1	93.6	98.6	96.9	96.5

-/ No samples taken.

Table 6. Proportion of treated acres lost by cause of loss and forest type in the North. 1974-1981.

Forest Type/Region	Cause of Loss							Total	
	Fire	Drought	Row Crops	Flood	Insects & disease	Pasture	Development		
	Percent								
White-Red-Jack Pine	3.4	61.9	0.0	0.6	7.4	0.6	2.8	23.3	100.0
Spruce-Fir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
Loblolly-Shortleaf	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Oak-Pine	0.0	0.0	0.0	0.0	25.3	0.0	0.0	74.7	100.0
Oak-Hickory	0.0	16.9	0.0	0.0	5.1	11.9	3.4	62.7	100.0
Maple-Beech-Birch	0.0	0.0	0.0	0.0	0.0	0.0	11.1	88.9	100.0
All Types	1.7	34.6	0.0	0.3	11.5	2.2	2.5	47.2	100.0

Table 7. Proportion of treated acres lost by tract size and forest type in the North. 1974-1981.

Forest Type/Region	Tract Size (acres)					Total
	1-10	11-20	21-40	41-80	81+	
	Percent					
White-Red-Jack Pine	42.6	22.2	0.0	35.2	-	100.0
Spruce-Fir	100.0	0.0	0.0	0.0	-	100.0
Loblolly-Shortleaf	100.0	0.0	0.0	0.0	0.0	100.0
Oak-Pine	0.0	0.0	34.3	65.7	0.0	100.0
Oak-Hickory	49.2	50.8	0.0	0.0	0.0	100.0
Maple-Beech-Birch	100.0	0.0	0.0	0.0	0.0	100.0
All Types	35.8	19.3	9.5	35.5	0.0	100.0

-/ No sample taken.

Table 8. Proportion of treated acres lost by treatment and forest type in the North. 1974-1981.

Forest Type	Treatment						Total
	Plant Bare Land	Site Preparation and Planting	Pre-commercial Thin	Under-story Release	Cull Tree Removal	Prune	
	Percent						
White-Red-Jack Pine	20.5	69.9	1.7	0.0	-	8.0	100.0
Spruce-Fir	100.0	0.0	0.0	0.0	-	-	100.0
Loblolly-Shortleaf	100.0	0.0	-	0.0	0.0	-	100.0
Oak-Pine	0.0	0.0	0.0	74.7	25.3	-	100.0
Oak-Hickory	11.9	16.9	27.1	11.9	32.2	0.0	100.0
Maple-Beech-Birch	-	0.0	83.3	0.0	16.7	-	100.0
All Types	13.7	37.2	9.5	22.6	13.1	3.9	100.0

-/ No sample taken.