

Prescribed Burning Can Pay Its Way

Understory control through prescribed burning simplifies management while materially reducing harvesting cost

By RALPH A. KLAWITTER
Southeastern Forest Experiment Station

Ever try cruising or logging an immature stand of South Carolina Coastal Plain loblolly pine where the only disturbance for many years has been an occasional improvement cutting? If you have, then you know what it's like to struggle from tree to tree through a tangled mass of understory hardwoods, shrubs, and vines. Stop to count and you would find thousands of understory stems of various sizes on an acre. They're tough to see through and tougher to get through. They slow the work and a slow-down costs money.

Compare the foregoing situation with another one where periodic prescribed winter burning keeps the understory under control. Such a stand is easier to mark and to log; or in other words, more profitable to manage. Results obtained from two adjacent units in the same 50-year old loblolly pine stand on the Santee Experimental Forest bear this out (Figure 1). A 100-acre pine stand, averaging 15-inches d.b.h. and 12,000 board-feet per acre, was split into equal areas that differed only in treatment of the understory. Area 1 was prescribed burned in February 1946, December 1949, and January 1956 to simplify pine regeneration

at the time of harvest cutting some 10 years hence. In Area 2, understory control was limited to that which might result from logging activity. So far all logging has been associated with improvement cuts made in 1946 and 1957 over both areas.

Understory hardwood and shrub stems in the stand numbered about 10,000 per acre before treatment began (Table 1). Of that number approximately 150 were 2-inches d.b.h. and larger—a size not easily controlled by winter burning. Continued fire exclusion and improvement cutting in Area 2 tripled understory stems over 2-inches d.b.h. during the past 10 years.

In contrast, three prescribed fires in Area 1 have gradually reduced the larger understory stems (2-inches d.b.h. and larger) to about 20 per acre. The remaining understory stems were converted to small sprouts which can be kept under control by additional prescribed fires as needed. Although there were about 42,000 of these small sprouts per acre, the number of rootstocks has remained nearly constant during the last 10 years. In summary, we can say prescribed burning has greatly simplified management

activities in Area 1, while continued fire exclusion in Area 2 has made them more difficult.

Probably the most significant finding
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TABLE 1
Changes in the Hardwood and Shrub Understory of a Loblolly Pine Stand During a Ten-year Period

Size	Before treatment	10 Years later	
		Burned	Unburned
	Stems per acre		
2 inches d.b.h. and larger	150	20	410
All sizes	10,000	42,500	11,000

TABLE 2
Equipment-hours and Man-hours Needed to Log Sawtimber and Pulpwood from Test Area, April 1957

Area	Time requirement per thousand board-feet ¹		Time requirement per cord	
	Equipment	Labor	Equipment	Labor
- - - Hours - - -				
Unburned	0.81	3.1	0.77	5.7
Burned	.59	2.3	.59	4.7
Percent decrease	27	26	23	18

¹ Scribner Decimal C. log rule.

Adjacent units after second improvement cut in 50-year-old loblolly pine stand. Area 2, at left, has had no prescribed burning and heavy understory slows down logging and forestry activities. Area 1, right, one year after third prescribed winter burn, is easy to work in.



thus far is that prescribed winter burning can pay its way (Table 2). Understory control through prescribed burning made logging easier and, consequently, cheaper. Logging man-hours were reduced as much as 26 percent, and one of the most expensive items in logging—equipment—use for felling and skidding sawtimber—decreased 27 percent. Moreover, pulpwood removal required much less effort. Average saw log production was stepped-up, from 1,200 board-feet to 1,700 board-feet, while cordwood production increased from 1.3 cords to 1.7 cords for each hour of operation.

The actual cash benefits from the decreased cost depend on the values assigned to various units of work involved. Average cost data were obtained from two loggers operating in the locality. Their values indicated the decrease in equipment- and man-hours in Table 2 for saw log removal to be worth a total of \$2.29 per thousand board-feet. Likewise, the reduced cordwood production cost, from the stump to the loaded truck, was estimated at \$1.50 a cord. These values represent potential stumpage returns to the landowner and are in addition to other tangible benefits, such as reduced inventorying and marking costs, as well as a reduction in fire hazard.

Potential stumpage return and actual stumpage return are two different things, of course. Whether the landowner can actually obtain more for stumpage by controlling the understory depends on a great number of factors: local market conditions as affected by supply and demand, and number of buyers; the level of understory control practiced on adjacent timberlands; realization by the timber purchaser that it's less expensive to log in stands where the understory is controlled; and salesmanship of the timber seller.

Nevertheless, in many instances prescribed burning does not need to be considered a long term investment requiring

an immediate cash outlay with little prospect for an early return. Where the landowner and timber purchaser agree that controlling understory brush produces a saving in logging cost, and at least part of the saving is returned to stumpage, the cost of prescribed burning is an investment which can pay its way. This return is in addition to the host of other management benefits that result from the use of prescribed fire.

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