PUBLIC PREFERENCES OF LOBLOLLY PINE (*Pinus taeda*) STANDS GENERATED BY DIFFERENT SITE PREPARATION METHODS

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Introduction

In recent decades, the public's demand for non-timber products and services from forests has dramatically increased. To meet these diverse demands, particularly from public forests, has called for the critical evaluation of non-timber as well as timber benefits of forest resources. However, it has been a challenge to elicit and quantify public preferences for non-timber benefits because of the lack of an existing market structure. Moreover, social acceptability, which is much more than monetary values, has become an important issue in public forest management (Brunson 1996). In this paper, public references of stand attributes for loblolly pine (*Pinus taeda L.*) generated by four site preparation methods are surveyed and analyzed. The effects of socioeconomic and demographic factors on user preferences are also examined and discussed. Another paper at this conference presents an integrated analysis of these non-timber attributes with their timber outputs and sustainability indicators.

Materials and Methods

Sixteen research plots were established in the Tuskegee National Forest, Alabama, USA, in the loam hills of the Hilly Coastal Plain Physiographic Province using four site preparation methods. The research site was a 42-year old plantation, where only pines >10 cm dbh had been harvested. Large and small hardwoods (1,600 stems ha^{-1}), shrubs (1,300 stems ha^{-1}), and residual pines (188 stems ha^{-1} > 4 cm dbh) remained. The site preparation methods examined were: (1) no site preparation, (2) chainsaw felling of all woody plants taller than 60 cm, (3) herbicide tree injection of both hardwoods and pines ≥ 5 cm dbh using picloram plus 2, 4-D, and (4) spot-grid applications of the soil-active herbicide herazinone. After site preparation, loblolly pine seedlings were planted on all plots using a 2.4 m by 2.4 m spacing. The experiment was a randomized complete block design with four replications. Fifteen years after planting, the no site preparation and soil-active herbicide produced mixed-unevenaged stands with varying levels of large residual pines and hardwoods. The chainsaw felling and tree injection resulted in mixed-evenaged stands.

A user survey was conducted to identify the public preferences of the site preparation methods. Two hundred persons randomly selected from three counties surrounding or near the Tuskegee National Forest were interviewed. During the interview, the interviewees were presented with four enlarged (20 cm by 25 cm), color photographs of the 15-year old forest stands resulting from the four site preparation methods. The color photos used for the interviews were taken in April 1995. The interviewees were not told that herbicides were used in the tree injection and soil-active herbicide methods. The interviewees were asked to release their preferences by ranking the four forest stands. The non-timber benefits considered by the interviewees included

Wagner, R.G. and D.G. Thompson (comp.). 1998. Third International Conference on Forest Vegetation Management: Popular summaries

aesthetics, picnicking, hiking/walking/cycling, camping, hunting, bird watching, wildlife habitat, and biodiversity. The relative importance of these benefits was also surveyed by using an index value ranging from 0 to 10 (Gan *et al.* 1998). An analysis of variance was conducted by using the General Linear Model approach to examine the effects of the site preparation methods and socioeconomic and demographic variables on the preferences of the interviewees.

Results and Discussion

The interviewees considered wildlife habitat as the most important non-timber benefit and hunting as the least important. Hiking/walking/cycling was the second most important, followed by picnicking, biodiversity, camping, aesthetics, and bird watching (Table 1).

Table 1. Importance of Non-timber Benefits

Non-timber Benefit	Importance	Ranking
Wildlife habitat	6.65	1
Hiking/walking/cycling	6.16	2
Picnicking	6.05	3
Biodiversity	5.90	4
Camping	5.76	5
Aesthetics	5.62	6
Bird watching	5.58	7
Hunting	5.23	8

Table 2. Comparison of Site Preparation Methods by Non-timber Benefit

Non-timber Benefit	No Site Preparation	Chainsaw Felling	Tree Injection	Soil-Active Herbicide
Aesthetics	6.92 (1)[a]	5.58 (3)	5.73 (2)	5.51 (4)
Picnicking	5.80 (1)	4.82 (4)	5.60 (2)	5.02 (3)
Hiking/walking/cycling	6.28 (1)	5.60 (4)	6.23 (2)	5.81 (3)
Camping	6.24 (1)	5.34 (4)	6.06 (2)	5.60 (3)
Hunting	6.74 (1)	6.59 (2)	5.97 (3)	5.91 (4)
Bird watching	6.62 (1)	6.43 (2)	6.04 (3)	5.81 (4)
Wildlife habitat	7.03 (1)	6.71 (2)	5.99 (4)	6.12 (3)
Biodiversity	6.17 (1)	5.60 (2)	5.25 (3)	5.21 (4)
Total (weighted average)	6.47 (1)	5.83 (2)	5.68 (3)	5.63 (4)

[a] The number inside parentheses represents the ranking of the four stands.

The comparison of the interviewees' preferences for the four site preparation methods is shown in Table 2. The interviewees ranked no site preparation as the best among the four treatments for each of the non-timber benefits. According to the weighted average of the index values for all the non-timber benefits, no site preparation was also ranked the first, chainsaw felling the second, tree injection the third, and soil-active herbicide the last. However, the weighted averages for tree injection and soil-active herbicide were almost the same.

The results from the analysis of variance indicated that there was statistically significant difference in the interviewees' preferences for the forest stands generated by the four site preparation methods. And, interviewees' age, education, income, employment status, and living distance from the National Forest had a significant effect (p-value < 0.05) on their rankings of the site preparation methods, whereas gender, occupation, and previous visit to the forest did not (Table 3). The interactions of site preparation with the socioeconomic and demographic variables were not significant (α=0.05).

The respondents ranked the stand generated without site preparation significantly higher than that yielded by chainsaw felling. But there was no significant difference among chainsaw felling, tree injection, and soil-active herbicide. Younger and older respondents had higher preference of non-timber benefits than the group aged between 40 and 60 years. Education was positively related to the valuation of non-timber benefits. Respondents with annual income between $40,000 and $49,999 gave higher rankings than in any other income category. Full-time or part-time employees and students ranked non-timber benefits higher than the unemployed and retirees. In addition, respondents who lived 26-75 miles away from the forest ranked the non-timber benefits lower than those living closer to or farther from the forest.

Overall, the respondents preferred no site preparation to chainsaw felling, tree injection, and soil-active herbicide. Age, education, income, employment, and living distance from the forest did affect respondents' rankings of the non-timber benefits of the forest stands generated by the four site preparation methods. These results provide some insight into user preferences or social acceptability of the site preparation practices.

Table 3. Effect of Treatments and Other Factors on the Preference of the Respondents

Factor	P-value of the preference for all non-timber benefits
Treatment	0.0290
Previous visit to the National Forest	0.5406
Age	0.0087
Education	<0.0001
Gender	0.1839
Annual household income	<0.0001
Employment status	<0.0001
Occupation	0.4749
Living distance from the National Forest	0.0005

References

Brunson, M.W. 1996. USDA Forest Service Gen. Tech. Rep. PNW-GTR-269, pp 7-16.

Gan, J., *et al.* In press. Forest Ecology and Management.