Pest or Product? Willingness to Pay for Eastern Redcedar Removal in Oklahoma

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Introduction

Encroachment by eastern redcedar, an invasive species, threatens the ecosystem health and agriculture returns in the southern Great Plains. The invasion of eastern redcedar has a detrimental effect on livestock and wheat production in Oklahoma by competing with native grasses, reducing available forage, competing for scarce water resources and negatively affecting human health. The estimated costs of management are in between $3 to $150 per acre depending on the type of habitat, the level of encroachment, and treatment technique (Bidwell and Weir 2007). Recently, the rising costs associated with removal of mature trees has rekindled interest in biofuel use of redcedar or the creation of marketable cedar products. In order to estimate whether such enterprises may be viable, an estimate of the potential supply of redcedar is needed. Therefore it is essential to identify the factors that can influence landowners' willingness to pay for eastern redcedar removal.

Objective

- To determine landowners' willingness to pay per acre for eastern redcedar removal based on canopy coverage, prior efforts at control, and land use.

Methods

•An internet survey of landowners was conducted on April 28 2015 to June 7, 2015.

•Email addresses were obtained from landowners listed as sellers of eastern cedar from Oklahoma Forestry Services and a list of owners throughout the state of Oklahoma who are willing to work with OK Cooperative Extension.

•The response rate was 31.44%. (n=74)

•The survey composed of a discrete choice experiment questions about land and demographic characteristics.

•The conditional logit model was used to determine the estimates of the attributes.

Results

Table 1. Summary of Demographic of Respondents

Variable	%
Gender	
Male	71.63
Female	28.37
Race	
White	82.43
Black, African American	1.35
Native American	9.46
Bi-racial	2.70
Other	4.05
Ethnicity	
Not hispanic or Latino	100
Education Level	
High school diploma	20.27
Undergraduate degree	50
Graduate degree (Masters, Doctorate, J.D., MBA)	29.73
Gross receipts	
Less than $40,000	86.49
$40,000-$99,999	5.41
$100,000-$249,999	4.05
$250,000 or more	4.05
Household income	
$25,000 - $49,999	20.55
$50,000 - $99,999	19.18
Greater than $99,999	43.24

Table 2. Conditional Logit Parameter Estimates

Independent Variables	Basic Model	Model 2 (Management Model)	Model 3 (Crops Land Model)
Canopy_cover_20	0.377*** (0.138)	0.369** (0.157)	0.814*** (0.228)
Canopy_cover_50	0.733*** 0.158	0.599*** (0.174)	0.985*** (0.240)
Canopy_cover_80	0.740*** (0.139)	0.709*** (0.157)	0.903*** (0.23)
Price	-0.010*** (0.001)	-0.010*** (0.001)	-0.01*** (0.001)
cover50_combine		0.959*** (0.286)	
cover80_no_management		-0.671* (0.357)	
cover80_combine		0.710** (0.287)	
cover20_pasture			-0.005* (0.003)
cover20_hay			-0.011** (0.005)

Table 3 Willingness to pay per acre for removal

Independent Variables	Basic Model	Model 2 (Management Model)	Model 3 (Crops Land Model)
Canopy_cover_20	$36.92 (11.73)	$35.85 (13.87)	$81.38 (21.54)
Canopy_cover_50	$71.85 (11.67)	$58.14 (13.75)	$98.53 (21.88)
Canopy_cover_80	$72.54 (10.62)	$68.86 (13.18)	$90.33 (20.93)
cover50_combine		$151.28 (25.30)	
cover80_no_management		$3.73 (94.36)	
cover80_combine		$137.79 (26.11)	
cover20_pasture			$80.87 (21.32)
cover20_hay			$80.25 (21.29)

Standard errors in parentheses

Conclusions

- Results suggest that the landowners were willing to pay more for removal of eastern redcedar as canopy cover decreased, but at a marginal declining per percent cover as coverage increased.
- The willingness to pay for canopy coverage also significantly varied by management , i.e., those who had 50% cover who had controlled cedar before were willing to pay $151.28/acre more compared to those who had not.
- Landowners with 20% redcedar cover on their land in hay and pasture were also significantly more willing to pay $80 per acre more for removal compared to those who used land for other uses such as recreation .
- *Results will help target landowners willing to remove redcedar for either biofuel production or ecosystem restoration.*

References

Bidwell, T.G., and Weir, J.R., 2007. Eastern Redcedar Control and Management – Best Management Practices to Restore Oklahoma's Ecosystems, NREM Fact Sheet No. 2876. Stillwater, Oklahoma

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