Economic Impact of Hemlock Woolly Adelgid in Western North Carolina*

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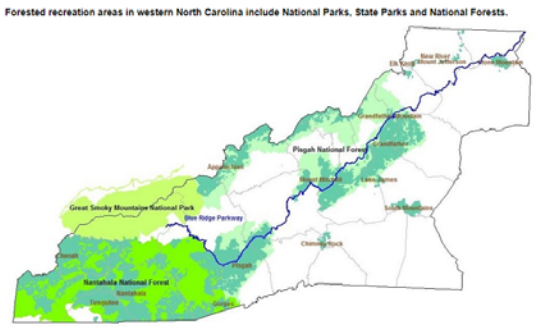
Abstract

This research aims to determine the economic impact of the Hemlock woolly adelgid (HWA), a non-native species found from Georgia to Maine, in Western North Carolina. Data were collected via online surveys in the summer of 2018 to a random sample of NC residents. We focus on residents who have visited NC in the last 12 months. Making use of regression and sensitivity analyses on the SPSS software platform we estimate a linear probability model of recreation trips at different levels of HWA. We use this model to estimate the decrease in recreational visits and consumer surplus as a result of varying degrees of consistent exposure to HWA. The research points to there being a significant relationship between increases in HWA and a decrease in recreational visits to WNC. The results are important for economic impact and benefit-cost analysis.

Hemlock woolly adelgid and WNC Forests

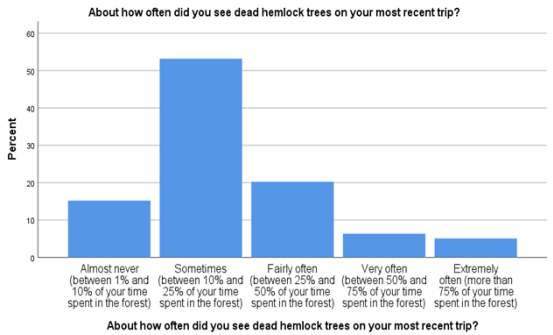


Survey Data

- Data was taken from an online survey conducted on Survey Monkey (SM) with the SM Audience Panel.
- Respondents were asked questions about their recent trip to Western North Carolina and whether they would still take this trip with increased travel costs and increased HWA.
- Original sample size of the survey was 327 respondents but was trimmed down to 115 due to item-nonresponse and other factors.
- All of the respondents were from North Carolina and had previously taken a trip to western North Carolina.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Average distance to all sites	460	61.82	400.92	167.8302	81.79177	6689.893
Valid N (listwise)	460					



Choice Question

Suppose that the national average gas price is $4.00 per gallon and operating costs are about 22 cents per mile for a medium-sized sedan.

Suppose that your one-way driving distance to the Pisgah Ranger District is the same as it is right now.

Suppose that you expect to see dead hemlock trees "almost never" (1% to 10% of your time spent in the forest).

Do you think you would still plan to take your next trip to the Pisgah Ranger District under these conditions?

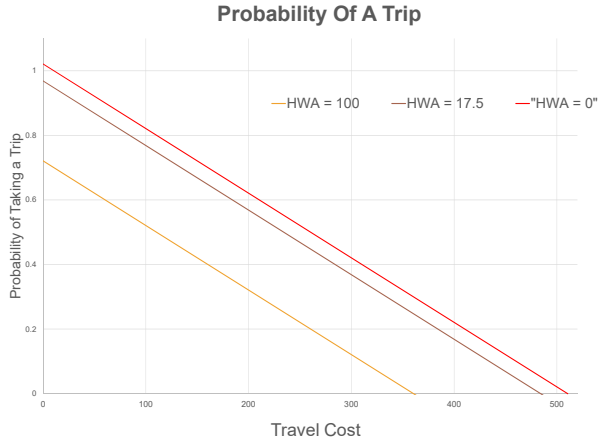
- ○ Yes
- ○ No

Recreation Demand

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.021	.043		23.812	.000
	HWA2	-.003	.001	-.173	-3.774	.000
	tc	-.002	.001	-.212	-4.608	.000

a. Dependent Variable: YES2



Conclusions

- We conclude that HWA presence contributes to a decreased probability of visiting Western North Carolina forests.
- Calculating the difference in consumer surplus of seeing HWA 100% of the time and the consumer surplus of seeing HWA 17.5% of the time we arrived at lost consumer surplus of $105 per trip.
- Calculating the difference in consumer surplus of seeing HWA 17.5% of the time and the consumer surplus of seeing HWA 0% of the time we arrived at lost consumer surplus of $26 per trip.
- These estimates could be aggregated over NC households to conduct a benefit-cost analysis of an HWA prevention program.

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