Emerald Ash Borer Infestation Rates in Michigan, Ohio, and Indiana, 2007

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Summary

The goal of this study was to obtain an estimate of the infestation rate of ash trees with emerald ash borer (EAB), across its primary infestation zone of southern Michigan, northeast Indiana, and northwest Ohio. A two-stage, two-phase stratified statistical sample was performed on a 31 million acre area, across two sampling zones; a more heavily sampled 12.7 million acre core zone, primarily in southeastern Michigan (the primary quarantine zone at the time), and a more lightly sampled area northwest and south of the core area. Based on this sample, in the core area 21% of the ash were estimated to be infested with EAB, about 8% were dead with signs of EAB, about 13% were alive with signs of EAB. In the outer area, 13% of the ash trees were estimated to be infested with EAB, about 2% were dead with signs of EAB attack, and about 11% were alive with signs of EAB. U.S. Forest Service FIA estimates for the forested portions of the sampled area are that there are about 287 million ash trees (dbh ≥ 2 inches). Based on our survey estimates, there are about 30.8 million ash trees in non-forest conditions in the survey area. Using the area-wide estimate of a 16.89% infestation rate, about 53.6 million ash trees in both forest and non-forest conditions were estimated to be infested with EAB by 2007. The approximate estimate of sample standard deviation of the infestation percent is 4.3, about 25% of the16.89 % mean infestation rate. The 95% confidence interval for the number of EAB infested trees in the survey area is from 24.7 million to 82.7 million trees.

Estimated percentage of ash trees in analysis zones, by status

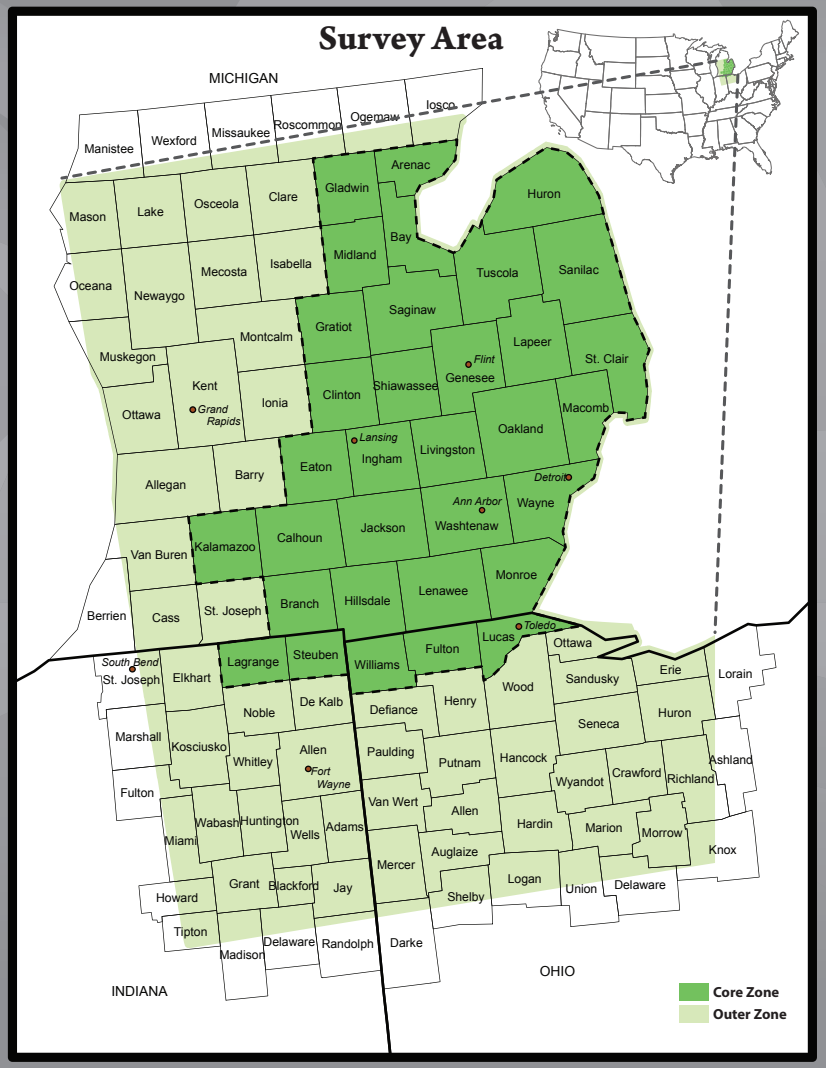
	% Live and Dead w/ EAB	% Live w/o EAB	% Live w/ EAB	% Live	% Dead w/o EAB	% Dead w/ EAB	% Dead all causes
Core Zone	21.16	75.75	13.42	89.17	3.09	7.75	10.83
Outer Zone	12.89	85.13	10.79	95.91	1.99	2.10	4.09
Entire Area	16.89	80.60	12.06	92.65	2.52	4.83	7.35

Estimated number of ash trees in analysis area, by status (when surveyed 2007)

	#Live and Dead w/ EAB	# Live w/o EAB	# Live w/ EAB	# Live	# Dead w/o EAB	# Dead w/ EAB	# Dead all causes
Core Zone	33,823,171	121,025,280	21,441,046	142,450,350	4,936,873	12,382,124	17,318,997
Outer Zone	19,748,538	130,426,149	16,531,166	146,941,994	3,048,843	3,217,372	6,266,216
Entire Area	53,571,709	251,451,430	37,972,212	289,392,344	7,985,716	15,599,497	23,585,213

Acknowledgements

The financial assistance of the State and Private Forestry Northeastern Area is gratefully acknowledged. In addition, several individuals made significant contributions to this project, including: GIS support: Jim Ellenwood, FHTET; Arpad Lazar and Vern Thomas, (both formerly) ITX Inc.; Field crew: Janet L. Ostien, Meghan A. Petras, Katie A. Pratt, Michigan Tech. Univ.; Aerial imagery acquisition; Barry Russell, (formerly) ITX, Inc., William Snyder, USFS; Photo interpretation: Roger Mech, MI DNR, Mark Roberts, USFS NA; Analytical assistance: Andrew McMahan and Michael Marsden, (both formerly) ITX, Inc.; Poster Design by Sheryl A. Romero, (formerly) ITX, Inc.



Distribution of ground plots and ash sample sizes by condition

	# Ground plots visited	# Ground Plots w/ash	# Ash on ground plots	# Ash w/ EAB on plots	# Live Ash w/ EAB on plots	# Dead Ash w/ EAB on plots	# Dead Ash Total
Core Zone	249	87	1198	416	281	135	183
Outer Zone	183	35	239	24	21	3	10
Entire Area	432	122	1437	440	302	138	193

These values only show sample sizes, they can not be used to calculate proportions directly because of unequal sample weights.