Kaleidoscope

Volume 9 Article 25

November 2011

An Exotic Invader Threatens an Ecologically Sensitive Bluegrass Savanna Remnant

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Ash tree throughout Kentucky and the eastern USA are threatened by a non-native wood-boring beetle from China, the **Emerald Ash Borer** (EAB), *Agrilus planipennis*. The EAB was first discovered in North America in the Great Lakes region in 2002; initial reports of its arrival in Kentucky occurred in 2009. Infestations by this exotic invader are usually fatal to North American ash, *Fraxinus* spp., which have no natural resistance to this highly destructive insect. Ash resources throughout rural and urban forests are at risk, and the unique ecosystem of the Inner Bluegrass region may be threatened by this exotic invasive species.

Pre-European settlement vegetation of the Inner Bluegrass region of Kentucky consisted of open-canopied, savannah-like forests that differed considerably from surrounding mixed mesophytic forests. Blue ash, *F. quadrangulata*, and bur oak, *Q. macrocarpa*, are considered 'signature trees' of the Inner Bluegrass, but the region also sustains white ash, *F. americana*, chinquapin, *Q. muehlenbergii*, and Shumard oaks, *Q. shumardii*, hickories, *Carya* spp., and Kentucky coffee tree, *Gymnocladus dioicus*. Human population pressures over the past centuries, including fragmentation and intensive land utilization, have placed increasing pressures on this unique and sensitive ecosystem.

Tree	Height (m)	Height to Crown(m)	dbh(cm)
Blue Ash 1	33.609816	11.00328	103.505
Blue Ash 2	25.11648	12.40536	119.38
Blue Ash3	22.009968	11.09472	146.812
White Ash 1	30.040632	11.21664	111.76
White Ash2	34.105536	12.46632	137.795
White Ash 3	14.111496	6.858	87.63
Chinkapin Oak 1	26.537544	7.83336	130.175
Chinkapin Oak 2	33.54372	14.1732	115.062
Chinkapin Oak 3	22.340448	8.19912	119.38

Griffith Woods is a protected 303 hectare property in the Inner Bluegrass region (Harrison Co.). The property was intensively farmed since the 1820's, including crop cultivation (tobacco, corn and alfalfa) and livestock grazing. This intense land utilization has resulted in a present day patchwork of vegetation types and successional stages, including agricultural, old savanna, and post-savanna woodlands. Because the savannas were protected from logging in previous centuries, Griffith Woods contains among the most valuable remnants of true oak-ash savanna and associated communities remaining. The unique nature of these community associates is the focus of our study.

My objective is to characterize the arthropod community associated with the ecologically sensitive bluegrass savanna ecosystem, focusing on those arthropods associated with our signature ash species, blue ash. My specific objective is to characterize the arthropod community associated with this signature species with respect to abundance, diversity, and seasonal distribution, focusing on aerial and foliar feeding insects. My proposed project is a natural progression from previous work I did at Griffith Woods, characterizing the ground-dwelling arthropod community associated with the savanna. Because blue ash is a signature species in an ecologically sensitive ecosystem threatened by an exotic invader, the emerald ash borer, this project will provide useable information to land managers seeking to protect this valued resource.

Date	Interval	Ecosystem	Tree Species	no.	Trap	# Leaves	Wet Mass	Dry Mass	LAI
6/21/2010	1	Savannah	Blue Ash	1	1	35	12.8526		797.54
6/21/2010	1	Savannah	Blue Ash	1	2	39	14.0268		874.47
6/21/2010	1	Savannah	Blue Ash	1	3	31	11.8894		790.83
6/21/2010	1	Savannah	Blue Ash	2	1	35	11.2167		521.88
6/21/2010	1	Savannah	Blue Ash	2	2	47	16.1775		726.54
6/21/2010	1	Savannah	Blue Ash	2	3	57	17.4981		854.37
6/21/2010	1	Savannah	Blue Ash	3	1	44	16.4338		720.23
6/21/2010	1	Savannah	Blue Ash	3	2	48	20.463		882.8
6/21/2010	1	Savannah	Blue Ash	3	3	53	22.3415		1000.67
6/21/2010	1	Savannah	White Ash	1	1	56	15.3654		787.28
6/21/2010	1	Savannah	White Ash	1	2	57	17.0538		848.86
6/21/2010	1	Savannah	White Ash	1	3	36	10.4312		511.95
6/21/2010	1	Savannah	White Ash	2	1	63	19.5123		958.18
6/21/2010	1	Savannah	White Ash	2	2	55	13.7865		735.53
6/21/2010	1	Savannah	White Ash	2	3	63	15.2788		810.67
6/21/2010	1	Savannah	White Ash	3	1	49	11.8536		506.89
6/21/2010	1	Savannah	White Ash	3	2	62	16.8525		753.78
6/21/2010	1	Savannah	White Ash	3	3	47	12.5436		560.17
6/21/2010	1	Savannah	Chinkapin Oak	1	1	19	10.7165		670.22
6/21/2010	1	Savannah	Chinkapin Oak	1	2	10	8.3512		504.46
6/21/2010	1	Savannah	Chinkapin Oak	1	3	21	14.1639		698.34
6/21/2010	1	Savannah	Chinkapin Oak	2	1	12	6.4218		506.36
6/21/2010	1	Savannah	Chinkapin Oak	2	2	21	14.3108		923.2
6/21/2010	1	Savannah	Chinkapin Oak	2	3	22	14.887		1089.39
6/21/2010	1	Savannah	Chinkapin Oak	3	1	21	7.0369		727.84
6/21/2010	1	Savannah	Chinkapin Oak	3	2	21	14.3871		839.98
6/21/2010	1	Savannah	Chinkapin Oak	3	3	25	12.5127		877.43
7/21/2010	2	Savannah	Blue Ash	1	1				
7/21/2010	2	Savannah	Blue Ash	1	2				
7/21/2010	2	Savannah	Blue Ash	1	3				
7/21/2010	2	Savannah	Blue Ash	2	1	71	23.2819		1022.39
7/21/2010	2	Savannah	Blue Ash	2	2	48	10.4061		443.03
7/21/2010	2	Savannah	Blue Ash	2	3	60	17.8214		778.69
7/21/2010	2	Savannah	Blue Ash	3	1	54	27.6215		1115.64
7/21/2010	2	Savannah	Blue Ash	3	2	72	27.6118		1176.34
7/21/2010	2	Savannah	Blue Ash	3	3	66	24.2647		1060.59
7/21/2010	2	Savannah	White Ash	1	1	68	26.1037		1113.66
7/21/2010	2	Savannah	White Ash	1	2	64	21.2796		927.44
7/21/2010	2	Savannah	White Ash	1	3	72	33.7589		1457.42
7/21/2010	2	Savannah	White Ash	2	1	66	15.0916		535.47
7/21/2010	2	Savannah	White Ash	2	2	74	15.7978		552.87
7/21/2010	2	Savannah	White Ash	2	3	70	17.2833		632.21
7/21/2010	2	Savannah	White Ash	3	1	62	22.7613		979.8
7/21/2010	2	Savannah	White Ash	3	2	50	13.8835		584.68
7/21/2010	2	Savannah	White Ash	3	3	55	18.7271		720.39
7/21/2010	2	Savannah	Chinkapin Oak	1	1	32	21.4997		1169.02
7/21/2010	2	Savannah	Chinkapin Oak	1	2	31	22.3113		1315.54
7/21/2010	2	Savannah	Chinkapin Oak	1	3	22	12.8845		778.23
7/21/2010	2	Savannah	Chinkapin Oak	2	1	22	12.4051		736.72
7/21/2010	2	Savannah	Chinkapin Oak	2	2	27	14.5794		885.18
7/21/2010	2	Savannah	Chinkapin Oak	2	3	23	14.1926		683.68
7/21/2010	2	Savannah	Chinkapin Oak	3	1	21	9.9804		583.56
7/21/2010	2	Savannah	Chinkapin Oak	3	2	19	9.132		532.54
7/21/2010	2	Savannah	Chinkapin Oak	3	3	23	15.1977		910.41
7/21/2010	2	Savannah	White Ash	3	3	55	18.7271		720.39
7/21/2010	2	Savannah	Chinkapin Oak	1	1	32	21.4997		1169.02
7/21/2010	2	Savannah	Chinkapin Oak	1	2	31	22.3113		1315.54
7/21/2010	2	Savannah	Chinkapin Oak	1	3	22	12.8845		778.23
7/21/2010	2	Savannah	Chinkapin Oak	2	1	22	12.4051		736.72
7/21/2010	2	Savannah	Chinkapin Oak	2	2	27	14.5794		885.18
7/21/2010	2	Savannah	Chinkapin Oak	2	3	23	14.1926		683.68
7/21/2010	2	Savannah	Chinkapin Oak	3	1	21	9.9804		583.56
7/21/2010	2	Savannah	Chinkapin Oak	3	2	19	9.132		532.54
7/21/2010	2	Savannah	Chinkapin Oak	3	3	23	15.1977		910.41