

SUPPLEMENTARY TECHNICAL APPENDIX

**Predictors of *I. scapularis* nymphal density.** In a previous model,<sup>1</sup> we assessed a large number of variables, including long-term climate data series from weather station data (NASA Terrestrial Observation and Prediction System<sup>2</sup>); remotely sensed climate and vegetation index data derived from the Advanced Very High Resolution Radiometer (AVHRR) (National Oceanographic and Atmospheric Administration and the Trypanosomiasis and Land-use in Africa Research Group of the University of Oxford<sup>3</sup>); elevation (Earth Resource Data Analysis System, Atlanta, GA); and soil tex-

ture data from the U.S. General Soil Map database.<sup>4</sup> The long-term climate data derived from weather stations and remote sensing were subjected to a temporal Fourier analysis (TFA) to remove noise from the seasonal data, achieve data reduction, and produce a set of uncorrelated outputs while retaining a description of seasonality.<sup>5</sup> Outcomes of the TFA included the detrended annual amplitude and phase of the maximum and minimum monthly temperature, precipitation, channel 3 middle infrared, land surface temperature, and normalized difference vegetation index. Amplitude is the maximum variation of the cycle around the mean and phase is its timing.

SUPPLEMENTARY TABLE 1  
List of sites where a minimum of one *I. scapularis* nymph were collected

Site	State	Year	N*	Prevalence†	DON‡	DIN§
Oak Mountain State Park	AL	2004	1	0.00	0.05	0.00
Devils Hopyard State Park	CT	2005	159	0.14	44.17	6.11
Mount Riga State Park	CT	2006	122	0.22	20.13	4.46
Fort McAllister State Park	GA	2004	1	0.00	0.08	0.00
Brushy Creek State Recreation Area	IA	2004	2	0.00	0.45	0.00
Pikes Peak State Park	IA	2005	1	0.00	0.23	0.00
Volga River State Recreation Area	IA	2006	1	0.00	0.25	0.00
Big River State Forest	IL	2005	10	0.00	2.72	0.00
Castle Rock State Park	IL	2005	88	0.14	20.28	2.77
Kankakee River State Park	IL	2006	1	0.00	0.23	0.00
Kickapoo State Park	IL	2005	24	0.04	6.05	0.25
Lincoln Trail State Park	IL	2004	4	0.00	1.25	0.00
Moraine View State Park	IL	2006	1	0.00	0.29	0.00
Natural Lands CA	IL	2004	41	0.15	14.91	2.18
Natural Lands CA	IL	2006	13	0.08	4.64	0.36
Palos Preserve	IL	2005	21	0.00	5.29	0.00
Pere Marquette State Park	IL	2006	1	0.00	0.17	0.00
Red Hills State Park	IL	2005	16	0.00	4.54	0.00
Wolf Creek State Park	IL	2005	6	0.17	1.44	0.24
Tippecanoe River State Park	IN	2004	41	0.15	6.52	0.95
Turkey Run State Park	IN	2005	13	0.00	3.44	0.00
Willow Slough SFWA	IN	2004	13	0.08	5.71	0.44
Diamond Hill State Park	MA	2006	2	0.00	0.33	0.00
Moore State Park	MA	2006	78	0.17	15.40	2.57
Moore State Park	MA	2004	42	0.05	6.63	0.32
Moore State Park	MA	2005	16	0.13	4.61	0.58
Elk Neck State Park	MD	2006	227	0.22	31.58	6.82
Elk Neck State Park	MD	2004	153	0.15	26.79	4.03
Elk Neck State Park	MD	2005	59	0.07	15.06	1.02
Pocomoke State Park	MD	2005	5	0.00	0.66	0.00
Rocky Gorge Reservoir	MD	2006	4	0.50	0.73	0.37
St. Marys State Park	MD	2006	10	0.60	2.60	1.56
Acadia National Park	ME	2006	43	0.23	7.88	1.83
Bradbury Mountain State Park	ME	2006	14	0.21	2.17	0.47
Crescent Beach State Park	ME	2004	145	0.50	30.09	14.94
Porcupine Mountains State Park	MI	2005	1	0.00	0.19	0.00
Shakey Lakes	MI	2005	7	0.00	1.42	0.00
Shakey Lakes	MI	2006	6	0.33	1.48	0.49
Shakey Lakes	MI	2004	5	0.00	2.44	0.00
Van Buren State Park	MI	2005	157	0.13	34.92	4.45
Warren Woods State Park	MI	2005	2	0.00	0.24	0.00
Banning State Park	MN	2005	47	0.43	8.15	3.47
Banning State Park	MN	2006	21	0.14	6.29	0.90
Foothills State Forest	MN	2004	126	0.37	28.03	10.46
Itasca State Park	MN	2006	6	0.17	1.87	0.31

(continued)

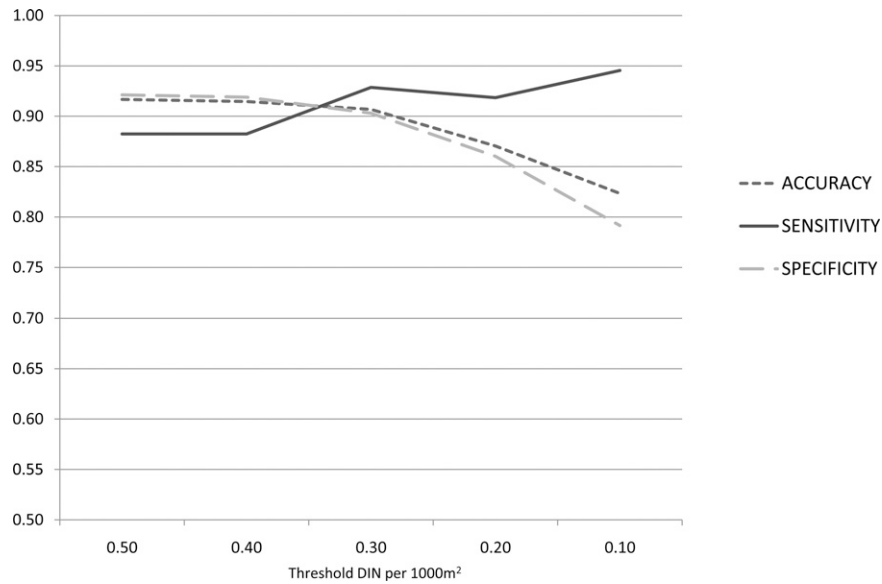
SUPPLEMENTARY TABLE 1

Continued

Site	State	Year	N*	Prevalence†	DON‡	DIN§
Jay Cooke State Park	MN	2004	15	0.20	2.98	0.60
Paul Bunyan State Forest	MN	2004	129	0.33	25.24	8.41
Sand Dunes State Forest	MN	2005	9	0.44	2.24	1.00
Sand Dunes State Forest	MN	2004	1	0.00	0.02	0.00
Sibley State Park	MN	2004	5	0.20	1.10	0.22
White Earth State Forest	MN	2005	1	1.00	0.14	0.14
Knob Noster State Park	MO	2004	1	0.00	0.78	0.00
Lake of the Ozarks State Park	MO	2005	1	0.00	0.34	0.00
Montauk State Park	MO	2004	1	0.00	0.18	0.00
Croatan National Forest	NC	2006	1	0.00	0.22	0.00
Hofmann Forest	NC	2005	3	0.00	0.34	0.00
Raven Rock State Park	NC	2006	1	0.00	0.11	0.00
Bear Brook State Park	NH	2005	4	0.00	1.48	0.00
Bear Brook State Park	NH	2006	4	0.00	0.68	0.00
Allaire State Park	NJ	2005	74	0.14	20.42	2.76
High Point State Park	NJ	2006	35	0.23	6.65	1.52
Parvin State Park	NJ	2005	19	0.37	7.04	2.59
Buttermilk Falls State Park	NY	2005	6	0.00	1.88	0.00
Cathedral County State Park	NY	2006	57	0.25	13.13	3.22
Cedar Point County Park	NY	2006	71	0.31	17.23	5.34
Connetquot River State Park	NY	2005	419	0.21	84.54	17.35
Fairhaven State Park	NY	2005	1	0.00	0.16	0.00
Fordham University	NY	2006	400	0.21	63.09	13.25
Fordham University	NY	2004	288	0.25	44.98	11.40
Grafton Lakes State Park	NY	2005	12	0.00	3.09	0.00
Grafton Lakes State Park	NY	2006	9	0.00	1.90	0.00
Grafton Lakes State Park	NY	2004	4	0.00	0.47	0.00
Moreau Lake State Park	NY	2005	19	0.00	3.74	0.00
Sunken Meadow State Park	NY	2004	4	0.00	0.59	0.00
Verona Beach State Park	NY	2004	77	0.03	14.02	0.36
Osage Hills State Park	OK	2004	4	0.00	0.63	0.00
Pawnee Bill Ranch Site	OK	2004	1	0.00	0.13	0.00
French Creek State Park	PA	2005	32	0.09	8.98	0.84
Gifford Pinchot State Park	PA	2005	61	0.39	17.55	6.91
Parker Dam State Park	PA	2005	73	0.16	19.65	3.23
Presque Isle State Park	PA	2005	50	0.24	12.01	2.88
Prince Gallitzin State Park	PA	2005	2	0.00	0.49	0.00
Arcadia Management Area	RI	2005	77	0.19	28.07	5.47
Harbison State Forest	SC	2005	1	0.00	0.12	0.00
Hunting Island State Park	SC	2004	1	0.00	0.08	0.00
Appomattox-Buckingham State Forest	VA	2005	1	0.00	0.29	0.00
Hemlock Overlook Regional Park	VA	2006	51	0.14	7.38	1.01
Pocahontas State Park	VA	2004	7	0.00	1.03	0.00
Twin Lakes State Park	VA	2006	7	0.00	1.26	0.00
Bomoseen State Park	VT	2006	16	0.00	2.39	0.00
Big Eau Pleine Woods Natural Area	WI	2006	506	0.18	101.29	18.62
Black River State Forest	WI	2005	12	0.25	3.98	0.99
Brunet Island State Park	WI	2005	138	0.22	27.80	6.04
Copper Falls State Park	WI	2006	19	0.32	5.51	1.74
Council Grounds State Park	WI	2005	9	0.33	2.42	0.81
Hartman Creek State Park	WI	2004	121	0.18	37.64	6.84
Hoffman Hills SRA	WI	2004	101	0.21	17.88	3.72
Kohler-Andrae State Park	WI	2004	47	0.06	21.95	1.40
Lake Wissota State Park	WI	2006	19	0.26	5.59	1.47
Mirror Lake State Park	WI	2006	208	0.11	41.69	4.61
Mirror Lake State Park	WI	2005	140	0.10	28.18	2.82
Mirror Lake State Park	WI	2004	23	0.22	11.09	2.41
North Highlands/American Legion Forest	WI	2006	7	0.14	1.49	0.21
Pattison State Park	WI	2006	2	0.00	0.84	0.00
Rib Mountain State Park	WI	2005	2	0.00	0.92	0.00
Wildcat Mountain State Park	WI	2005	116	0.16	25.70	4.21
Willow River State Park	WI	2006	47	0.19	13.99	2.68

\* N = sample size.

† Prevalence = proportion of *Borrelia burgdorferi*-infected *I. scapularis* nymphs.‡ DON = density of host-seeking *Ixodes scapularis* nymphs/1,000 m.§ DIN = density of infected host-seeking *Ixodes scapularis* nymphs/1,000 m.



SUPPLEMENTARY FIGURE S1. Accuracy, sensitivity, and specificity of the risk model for different threshold densities of infected nymphs (DIN) per 1,000 m<sup>2</sup>. Selected threshold for the final model was 0.3 DIN per 1,000 m<sup>2</sup>; lower thresholds resulted in no increase in sensitivity, although resulted in reductions in specificity and accuracy.

## REFERENCES

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