Supplemental Table 1. *Borrelia burgdorferi* s.s. and *A. phagocytophilum* molecular detection and identification methods by year range for surveillance sites in the upper Midwestern U.S., 2000-2019.

State	Pathogen	Year range	Published Method
MI	*B. burgdorferi* s.s.	2004-2017	Bunikis et al., 2004; Tsao et al., 2004
		2016-present	Graham et al., 2018
	A. phagocytophilum	2004-2017	Steiner et al., 2006
		2016-present	Graham et al., 2018
MN	*B. burgdorferi* s.s.	2005-2008	Ornstein et al., 2002
		2008-2011	Method 1, see description below
		2011-2015	Method 2, see description below
		2015-present	Method 3, see description below
	A. phagocytophilum	2005-2008	Massung et al., 1998
		2008-2011	Method 1, see description below
		2011-2015	Method 2, see description below
		2015-present	Method 3, see description below
WI	*B. burgdorferi* s.s.	2009-2018	Caporale and Kocher 1994
		2015-2017	Stauffer et al., 2020
		2018	Graham et al., 2018
	A. phagocytophilum	2009-2014	Steiner et al. 2006
		2015-present	Stauffer et al., 2020
WI-Stevens Point	*B. burgdorferi* s.s.	2000-2013	Caporale and Kocher 1994
		2014-2019	Caporale and Kocher 1994 (multiplex)
	A. phagocytophilum	2000-2013	Chen et al., 1994
		2014-2019	Chen et al., 1994 (multiplex)

Method 1 unpublished, Minnesota Department of Health (MDH) lab developed nested triplex PCR simultaneously amplifying partial OspA gene from *B burgdorferi* s.s., and ribosomal 16S gene from *A. phagocytophilum*.

Method 2 unpublished, MDH lab developed triplex PCR simultaneously amplifying partial OspA gene from *B burgdorferi* s.s., and Ank gene from *A. phagocytophilum.*

Method 3 unpublished, MDH lab developed triplex real-time TaqMan PCR simultaneously amplifying partial OspA gene from *B burgdorferi* s.s., and ribosomal 16S gene from *A. phagocytophilum*.

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Supplemental Table 2. *Ixodes scapularis* nymphal density and *B. burgdorferi* s.s. prevalence by year at 25 sampling sites in the Upper Midwest. Site summary information includes total years sampled, median nymphal density, median distance dragged per year, total number of ticks tested, and site prevalence and 95%CI for all years combined.

Survey site information			*I. scapularis* nymph density[a]		*B. burgdorferi* s.s. prevalence estimate 95% confidence interval[b]			
State	Site Name	Years Sampled	Peak nymphs/ 100m2	Area dragged (m2)	N ticks tested	Point estimate	Lower 95CI	Upper 95CI
MI	**Duck Lake State Park**	**7**	**0.40**	**2125**	**77**	**0.1429**	**0.0817**	**0.2380**
		2007	0.26	1520	4	0.0000	0.0000	0.4899
		2008	0.53	2650	14	0.0714	0.0037	0.3147
		2009	1.03	3000	20	0.0500	0.0026	0.2361
		2010	NA	NA	11	0.0000	0.0000	0.2588
		2012	0.03	3000	3	0.6667	0.2077	0.9829
		2018	0.25	1600	3	0.0000	0.0000	0.5615
		2019	0.88	1600	22	0.3182	0.1636	0.5268
MI	**Fenner Nature Center**	**5**	**3.00**	**1800**	**358**	**0.0140**	**0.0060**	**0.0323**
		2015	1.00	1800	28	0.0000	0.0000	0.1206
		2016	NA	NA	78	0.0385	0.0132	0.1071
		2017	8.12	825	65	0.0000	0.0000	0.0558
		2018	3.00	1900	122	0.0000	0.0000	0.0305
		2019	NA	NA	65	0.0308	0.0085	0.1054
MI	**Fort Custer Recreation Area**	**5**	**0.40**	**1520**	**82**	**0.2683**	**0.1844**	**0.3730**
		2011	0.05	3750	2	0.0000	0.0000	0.6576
		2015	0.27	1500	4	0.5000	0.1500	0.8500
		2016	NA	NA	8	0.1250	0.0064	0.4709
		2018	0.52	1540	17	0.2941	0.1328	0.5313
		2019	2.00	1500	51	0.2745	0.1711	0.4095
MI	**Ludington State Park**	**3**	**0.70**	**1600**	**62**	**0.1613**	**0.0900**	**0.2721**
		2014	0.44	3160	14	0.0000	0.0000	0.2153
		2018	0.70	1000	7	0.1429	0.0073	0.5131
		2019	0.75	1600	41	0.2195	0.1200	0.3671
MI	**Saugatuck Dunes State Park**	**6**	**0.88**	**1500**	**96**	**0.0521**	**0.0224**	**0.1162**
		2004	0.64	1400	10	0.0000	0.0000	0.2775
		2005	1.00	1000	30	0.0667	0.0185	0.2132
		2010	0.17	2420	4	0.0000	0.0000	0.4899
		2017	6.25	1200	3	0.3333	0.0171	0.7923
		2018	0.75	1600	12	0.0000	0.0000	0.2425
		2019	1.31	1600	37	0.0541	0.0150	0.1770
MI	**SLBE Platte-Eldorado**	**6**	**0.44**	**1550**	**133**	**0.1955**	**0.1370**	**0.2710**
		2012	0.07	3000	3	0.0000	0.0000	0.5615
		2013	3.10	1000	34	0.0294	0.0015	0.1492
		2014	0.17	3000	18	0.1111	0.0310	0.3280
		2015	0.13	1500	3	0.0000	0.0000	0.5615
		2018	0.70	1280	9	0.2222	0.0632	0.5474
		2019	2.63	1600	66	0.3182	0.2185	0.4379
MI	**Van Buren State Park**	**12**	**2.00**	**2000**	**1116**	**0.1201**	**0.1023**	**0.1405**
		2004	2.05	2000	24	0.1250	0.0434	0.3100

Survey site information			*I. scapularis* nymph density[a]		*B. burgdorferi* s.s. prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak nymphs/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
		2005	5.00	1000	817	0.1285	0.1073	0.1532
		2006	0.82	1100	3	0.3333	0.0171	0.7923
		2007	4.70	1000	18	0.2778	0.1250	0.5087
		2008	2.00	2200	48	0.0417	0.0115	0.1398
		2009	4.15	2000	21	0.1905	0.0767	0.4000
		2010	NA	NA	52	0.0962	0.0418	0.2061
		2011	0.70	2000	32	0.0313	0.0016	0.1574
		2012	0.17	3000	5	0.0000	0.0000	0.4345
		2014	0.53	2090	11	0.0000	0.0000	0.2588
		2017	3.45	1305	54	0.0926	0.0402	0.1991
		2019	1.63	1600	31	0.0968	0.0335	0.2490
MN	**Camp Ripley**	**11**	**1.54**	**2400**	**892**	**0.2119**	**0.1863**	**0.2399**
		2006	5.21	2400	100	0.1200	0.0700	0.1981
		2007	12.50	1000	49	0.1429	0.0710	0.2667
		2008	1.54	2400	102	0.1078	0.0613	0.1829
		2009	0.38	2400	80	0.2750	0.1892	0.3814
		2010	2.13	2400	89	0.1685	0.1049	0.2596
		2011	1.54	2400	125	0.3120	0.2374	0.3978
		2015	1.30	1000	51	0.3333	0.2197	0.4703
		2016	0.69	1600	58	0.3621	0.2505	0.4907
		2017	0.63	2400	83	0.2048	0.1320	0.3038
		2018	1.57	1400	89	0.1685	0.1049	0.2596
		2019	0.75	2400	66	0.1970	0.1189	0.3084
MN	**Richard J. Dorer Memorial Hardwood State Forest**	**8**	**0.46**	**2000**	**310**	**0.1419**	**0.1075**	**0.1852**
		2006	1.54	2400	89	0.0899	0.0463	0.1675
		2009	0.71	2400	39	0.2308	0.1265	0.3834
		2010	0.38	800	106	0.1038	0.0589	0.1763
		2011	1.13	800	19	0.2105	0.0851	0.4333
		2015	0.42	2400	24	0.2917	0.1491	0.4917
		2016	0.06	1600	6	0.1667	0.0085	0.5635
		2018	0.50	1800	21	0.1429	0.0498	0.3464
		2019	0.18	2200	6	0.1667	0.0085	0.5635
MN	**Itasca State Park**	**12**	**0.83**	**2000**	**723**	**0.1618**	**0.1368**	**0.1904**
		2005	0.90	1000	20	0.2500	0.1119	0.4687
		2006	3.33	2400	100	0.0700	0.0343	0.1375
		2007	2.39	800	51	0.0784	0.0309	0.1850
		2008	1.96	2400	102	0.1078	0.0613	0.1829
		2009	0.46	2400	69	0.1884	0.1135	0.2961
		2010	0.63	2400	35	0.1429	0.0626	0.2938
		2011	1.38	2400	82	0.2195	0.1436	0.3205
		2015	1.25	1600	59	0.2034	0.1204	0.3227
		2016	0.50	1200	53	0.3208	0.2109	0.4548
		2017	0.67	2400	48	0.1458	0.0725	0.2717
		2018	0.75	1200	66	0.1818	0.1072	0.2915

Survey site information			*I. scapularis* nymph density[a]		*B. burgdorferi* s.s. prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak nymphs/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
		2019	0.75	1600	38	0.1579	0.0744	0.3042
MN	**St. Croix State Park**	**11**	**2.40**	**2300**	**1132**	**0.1776**	**0.1564**	**0.2009**
		2006	3.54	2400	170	0.1882	0.1366	0.2536
		2007	12.00	800	51	0.2549	0.1555	0.3887
		2008	2.04	2400	102	0.1078	0.0613	0.1829
		2009	0.67	2400	122	0.2787	0.2068	0.3641
		2010	3.10	1000	105	0.1619	0.1036	0.2441
		2011	2.75	2400	137	0.2190	0.1579	0.2954
		2015	0.96	2400	69	0.2029	0.1249	0.3122
		2016	NA	NA	105	0.2000	0.1347	0.2865
		2017	4.25	1600	111	0.1532	0.0979	0.2316
		2018	0.59	2200	62	0.0645	0.0254	0.1545
		2019	1.50	1800	98	0.0816	0.0419	0.1529
WI	**American Legion Northern Highland**	**6**	**2.50**	**3600**	**624**	**0.1795**	**0.1514**	**0.2115**
		2011	NA	NA	57	0.2456	0.1523	0.3710
		2012	3.08	3600	111	0.2342	0.1652	0.3211
		2013	6.44	3600	232	0.1250	0.0885	0.1738
		2014	2.17	3600	78	0.1667	0.1001	0.2646
		2015	2.50	3600	90	0.2667	0.1862	0.3662
		2016	1.62	3450	56	0.1071	0.0500	0.2147
WI	**Big Eau Pleine County Park**	**6**	**7.29**	**5845**	**1960**	**0.2327**	**0.2145**	**0.2519**
		2013	65.70	1760	708	0.2881	0.2560	0.3226
		2014	0.41	7160	61	0.2787	0.1819	0.4017
		2015	9.85	4530	446	0.2085	0.1734	0.2486
		2016	4.72	12610	595	0.1748	0.1464	0.2074
		2017	1.55	9490	100	0.2400	0.1669	0.3323
		2018	10.80	1000	50	0.2800	0.1747	0.4167
WI	**Black River Falls State Forest**	**9**	**4.40**	**1000**	**835**	**0.2359**	**0.2084**	**0.2659**
		2009	NA	NA	6	0.3333	0.0968	0.7000
		2010	NA	NA	110	0.3455	0.2632	0.4382
		2011	NA	NA	128	0.1094	0.0663	0.1752
		2013	12.10	1000	121	0.2314	0.1652	0.3141
		2014	2.10	1000	103	0.4175	0.3269	0.5140
		2015	3.30	1000	111	0.2072	0.1422	0.2918
		2016	5.60	1000	106	0.2358	0.1652	0.3250
		2017	5.10	1000	101	0.1980	0.1320	0.2862
		2018	3.70	1000	49	0.0816	0.0322	0.1919
WI	**Camp Phillips**	**3**	**2.30**	**1000**	**268**	**0.2239**	**0.1781**	**0.2775**
		2016	2.00	1000	101	0.2673	0.1907	0.3610
		2017	7.90	1000	117	0.2137	0.1491	0.2964
		2018	2.30	1000	50	0.1600	0.0834	0.2851
WI	**Devil's Lake State Park**	**3**	**0.22**	**1000**	**146**	**0.0959**	**0.0580**	**0.1545**
		2016	0.22	900	10	0.2000	0.0567	0.5098
		2017	0.40	2000	91	0.0989	0.0529	0.1774
		2018	0.20	1000	45	0.0667	0.0229	0.1786

Survey site information			*I. scapularis* nymph density[a]		*B. burgdorferi* s.s. prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak nymphs/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
WI	**Flambeau State Forest**	**5**	**1.79**	**2400**	**263**	**0.2548**	**0.2059**	**0.3107**
		2012	1.67	2400	28	0.2857	0.1525	0.4706
		2013	3.83	2400	92	0.1957	0.1275	0.2882
		2014	0.92	2400	22	0.5000	0.3072	0.6928
		2015	3.25	2400	78	0.3077	0.2163	0.4171
		2016	1.79	2400	43	0.1395	0.0656	0.2726
WI	**Hartman Creek State Park**	**3**	**2.80**	**1000**	**393**	**0.2697**	**0.2282**	**0.3157**
		2016	17.80	900	166	0.3494	0.2810	0.4246
		2017	2.80	1000	177	0.1864	0.1359	0.2503
		2018	2.50	1000	50	0.3000	0.1910	0.4375
WI	**Kettle Moraine State Forest-Southern Unit**	**10**	**5.60**	**1000**	**894**	**0.2248**	**0.1987**	**0.2533**
		2009	NA	NA	20	0.4500	0.2582	0.6579
		2010	NA	NA	117	0.5299	0.4400	0.6180
		2011	NA	NA	130	0.3308	0.2558	0.4155
		2012	0.33	2150	7	0.2857	0.0822	0.6411
		2013	9.00	1300	117	0.1453	0.0927	0.2204
		2014	1.80	1000	105	0.0667	0.0327	0.1313
		2015	9.30	1000	124	0.2097	0.1473	0.2895
		2016	2.20	1000	100	0.1700	0.1089	0.2555
		2017	12.40	1000	124	0.1371	0.0874	0.2086
		2018	NA	NA	50	0.0200	0.0010	0.1050
WI	**Kohler-Andrae State Park**	**4**	**11.45**	**1000**	**333**	**0.2072**	**0.1671**	**0.2540**
		2014	5.00	1000	50	0.1400	0.0695	0.2619
		2016	11.40	1000	114	0.2018	0.1384	0.2846
		2017	11.50	2000	119	0.2101	0.1465	0.2918
		2018	15.10	1000	50	0.2800	0.1747	0.4167
WI	**McCaslin Brook**	**4**	**2.44**	**2400**	**225**	**0.1244**	**0.0875**	**0.1740**
		2012	0.96	2400	23	0.1304	0.0454	0.3213
		2013	2.46	2400	59	0.1695	0.0948	0.2846
		2014	2.42	2400	58	0.1724	0.0964	0.2891
		2015	2.80	3000	85	0.0588	0.0254	0.1304
WI	**Mirror Lake State Park**	**3**	**3.23**	**3000**	**358**	**0.0866**	**0.0617**	**0.1203**
		2016	1.20	1000	77	0.1688	0.1014	0.2677
		2017	4.72	4830	228	0.0658	0.0403	0.1057
		2018	3.23	3000	53	0.0566	0.0194	0.1537
WI	**Tower Hill State Park**	**4**	**3.40**	**1000**	**369**	**0.2818**	**0.2357**	**0.3280**
		2015	1.70	1000	120	0.3417	0.2629	0.4303
		2016	5.20	1000	101	0.2772	0.1993	0.3715
		2017	4.40	2000	98	0.2653	0.1880	0.3604
		2018	2.40	1000	50	0.1800	0.0977	0.3080
WI	**UW-Arboretum**	**7**	**0.40**	**13370**	**626**	**0.0879**	**0.0656**	**0.1101**
		2011	NA	NA	74	0.0000	0.0000	0.0493
		2013	0.81	13140	106	0.0283	0.0097	0.0799
		2014	0.06	12800	20	0.1500	0.0524	0.3604

Survey site information			*I. scapularis* nymph density[a]		*B. burgdorferi* s.s. prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak nymphs/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
		2015	0.22	12800	239	0.1172	0.0823	0.1641
		2016	0.23	13600	31	0.0323	0.0017	0.1619
		2017	0.57	13600	70	0.1429	0.0795	0.2434
		2018	0.65	13600	86	0.1163	0.0644	0.2010
WI	**Wildcat Mt. State Park**	**3**	**3.60**	**1000**	**319**	**0.0909**	**0.0640**	**0.1275**
		2016	3.50	1000	120	0.1583	0.1038	0.2341
		2017	3.60	1000	101	0.0495	0.0213	0.1107
		2018	5.00	1000	98	0.0510	0.0220	0.1139

[a] Ticks were collected via drag cloth during peak nymphal activity periods. Site summary densities and area dragged are the median of all years sampled.

[b] To identify *B. burgdorferi* s.s. in *I. scapularis* nymphs, ticks were tested individually using species specific molecular assays which met the minimum criteria for acceptability according to the Centers for Disease Control and Prevention Guidelines: "Surveillance for *Ixodes scapularis* and pathogens found in this tick species in the United States" (2018). https://www.cdc.gov/ticks/resources/TickSurveillance_Iscapularis-P.pdf. Point estimates and 95% confidence intervals were calculated using the Wilson score interval to account for years with low tick sample sizes.

Supplemental Table 3. *Ixodes scapularis* adult density and *B. burgdorferi* s.s. prevalence by year at 14 sampling sites in the Upper Midwest. Site summary information includes total years sampled, median adult density, median distance dragged per year, total number of ticks tested, and site prevalence and 95%CI for all years combined.

Survey site information			*I. scapularis* adult density[a]		*B. burgdorferi* s.s. prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak adults/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
MI	**Duck Lake State Park**	**5**	**0.48**	**2600**	**123**	**0.3008**	**0.2268**	**0.3869**
		2008	0.11	2650	3	0.0000	0.0000	0.5615
		2010	0.23	2600	6	0.1667	0.0085	0.5635
		2012	0.48	4000	42	0.3095	0.1907	0.4603
		2018	3.06	1600	49	0.3061	0.1952	0.4453
		2019	0.94	1600	23	0.3478	0.1881	0.5511
MI	**Fenner Nature Center**	**6**	**2.35**	**1400**	**652**	**0.0997**	**0.0790**	**0.1251**
		2014	1.67	1200	20	0.0000	0.0000	0.1611
		2015	0.50	2000	100	0.0100	0.0005	0.0545
		2016	3.43	1020	147	0.0136	0.0037	0.0482
		2017	2.35	2000	126	0.0000	0.0000	0.0296
		2018	4.29	1400	229	0.2358	0.1855	0.2949
		2019	NA	NA	30	0.2667	0.1418	0.4445
MI	**Fort Custer Recreation Area**	**5**	**1.64**	**2265**	**136**	**0.5149**	**0.4311**	**0.5979**
		2011	0.08	2560	4	0.0000	0.0000	0.6576
		2014	2.23	2150	48	0.4792	0.3447	0.6167
		2016	NA	NA	9	0.5556	0.2667	0.8112
		2018	1.05	2380	24	0.5000	0.3143	0.6857
		2019	3.93	1500	51	0.5686	0.4327	0.6950
MI	**Ionia Recreation Area**	**4**	**0.49**	**1970**	**28**	**0.0357**	**0.0018**	**0.1771**
		2010	NA	NA	4	0.2500	0.0128	0.6994
		2014	0.75	2140	16	0.0000	0.0000	0.1936
		2015	NA	NA	4	0.0000	0.0000	0.4899
		2018	0.22	1800	4	0.0000	0.0000	0.4899
MI	**Ludington State Park**	**3**	**0.44**	**2600**	**38**	**0.2368**	**0.1299**	**0.3921**
		2010	0.31	2600	8	0.0000	0.0000	0.3244
		2014	0.70	3160	22	0.3636	0.1973	0.5705
		2019	0.44	1600	8	0.1250	0.0064	0.4709
MI	**Saugatuck Dunes State Park**	**6**	**0.60**	**2010**	**56**	**0.3036**	**0.1990**	**0.4334**
		2004	NA	NA	2	0.0000	0.0000	0.6576
		2005	NA	NA	13	0.3077	0.1268	0.5763
		2010	0.54	2420	13	0.5385	0.2914	0.7679
		2017	0.33	1200	2	0.5000	0.0256	0.9744
		2018	0.65	2480	8	0.1250	0.0064	0.4709
		2019	0.75	1600	18	0.2222	0.0900	0.4521
MI	**SLBE Platte-Eldorado**	**7**	**0.58**	**2500**	**116**	**0.2500**	**0.1801**	**0.3360**
		2011	0.68	1460	19	0.0000	0.0000	0.1682
		2012	0.40	2000	25	0.0400	0.0021	0.1954

Survey site information			*I. scapularis* adult density[a]		*B. burgdorferi* s.s. prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak adults/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
		2013	NA	NA	8	0.1250	0.0064	0.4709
		2014	0.47	3000	21	0.2381	0.1063	0.4509
		2015	0.77	3000	34	0.5000	0.3407	0.6593
		2018	NA	NA	2	1.0000	0.3424	1.0000
		2019	NA	NA	7	0.4286	0.1582	0.7495
MI	**SLBE Pyramid Point**	**4**	**0.22**	**2750**	**26**	**0.1923**	**0.0851**	**0.3788**
		2012	0.16	2500	2	0.0000	0.0000	0.6576
		2013	0.10	2000	3	0.0000	0.0000	0.5615
		2014	0.27	3000	10	0.2000	0.0567	0.5098
		2015	0.37	3000	11	0.2727	0.0975	0.5656
MI	**Van Buren State Park**	**12**	**1.50**	**1600**	**574**	**0.3763**	**0.3376**	**0.4166**
		2004	1.10	1000	41	0.3171	0.1956	0.4698
		2005	1.50	1000	15	0.3333	0.1518	0.5829
		2006	0.82	1100	6	0.5000	0.1876	0.8124
		2007	1.50	1000	9	0.6667	0.3542	0.8794
		2008	4.53	2450	60	0.5167	0.3931	0.6382
		2009	2.20	2000	53	0.4151	0.2926	0.5491
		2010	1.10	1360	39	0.4615	0.3157	0.6143
		2011	2.40	2000	85	0.4000	0.3024	0.5063
		2012	5.10	3000	66	0.4242	0.3124	0.5444
		2014	3.01	2090	97	0.1649	0.1042	0.2513
		2018	NA	NA	55	0.4909	0.3638	0.6192
		2019	0.94	1600	48	0.2708	0.1657	0.4100
		2010	0.23	2600	6	0.1667	0.0085	0.5635
		2012	0.48	4000	42	0.3095	0.1907	0.4603
		2018	3.06	1600	49	0.3061	0.1952	0.4453
		2019	0.94	1600	23	0.3478	0.1881	0.5511
MN	**Itasca State Park**	**13**	**1.73**	**2400**	**1145**	**0.3790**	**0.3514**	**0.4075**
		2005	1.40	1000	41	0.4146	0.2776	0.5663
		2006	1.50	2400	100	0.3200	0.2367	0.4166
		2007	0.75	800	26	0.5000	0.3206	0.6794
		2008	3.17	2400	102	0.2157	0.1470	0.3050
		2009	1.96	2400	98	0.2857	0.2057	0.3819
		2010	0.75	2400	25	0.4800	0.3003	0.6650
		2011	2.25	2400	116	0.3879	0.3042	0.4788
		2014	4.54	2400	110	0.4818	0.3906	0.5742
		2015	2.13	1600	104	0.4327	0.3416	0.5286
		2016	0.54	2400	101	0.3663	0.2789	0.4636
		2017	NA	NA	100	0.4100	0.3187	0.5080
		2018	1.17	1200	103	0.4466	0.3542	0.5428
		2019	2.90	1000	119	0.3613	0.2806	0.4507
MN	**Camp Ripley**	**12**	**3.67**	**2400**	**1218**	**0.4507**	**0.4230**	**0.4788**
		2006	1.33	2400	80	0.4125	0.3111	0.5220

Survey site information			*I. scapularis* adult density[a]		*B. burgdorferi* s.s. prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak adults/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
		2007	5.10	1000	48	0.3750	0.2522	0.5164
		2008	4.50	2400	102	0.3725	0.2849	0.4694
		2009	2.54	2400	177	0.3446	0.2786	0.4173
		2010	1.00	800	27	0.5185	0.3399	0.6926
		2011	3.42	2400	150	0.2933	0.2264	0.3706
		2014	7.21	2400	123	0.5122	0.4248	0.5988
		2015	2.79	2400	99	0.4949	0.3985	0.5918
		2016	3.92	2400	105	0.6190	0.5235	0.7062
		2017	5.75	2400	106	0.4623	0.3703	0.5568
		2018	2.63	2400	100	0.6500	0.5525	0.7364
		2019	5.54	2400	101	0.4950	0.3995	0.5909
MN	**Richard J. Dorer Memorial Hardwood State Forest**	**10**	**1.57**	**2400**	**912**	**0.3827**	**0.3517**	**0.4146**
		2006	1.04	2400	44	0.2727	0.1635	0.4185
		2009	1.13	2400	74	0.4865	0.3761	0.5982
		2010	3.92	2400	115	0.3652	0.2829	0.4563
		2011	3.21	2400	110	0.3909	0.3049	0.4843
		2014	3.42	2400	102	0.2647	0.1888	0.3577
		2015	1.38	2400	95	0.5474	0.4474	0.6437
		2016	0.70	2000	111	0.4234	0.3356	0.5164
		2017	2.67	2400	105	0.3048	0.2249	0.3984
		2018	0.38	2400	45	0.3333	0.2136	0.4793
		2019	1.75	1600	111	0.3874	0.3020	0.4803
MN	**St. Croix State Park**	**12**	**2.92**	**2400**	**1291**	**0.3261**	**0.3011**	**0.3522**
		2006	3.00	2000	130	0.2462	0.1801	0.3268
		2007	1.50	800	40	0.3250	0.2008	0.4798
		2008	3.75	2400	102	0.2843	0.2058	0.3784
		2009	2.92	2400	157	0.3248	0.2565	0.4015
		2010	0.75	2400	45	0.5556	0.4118	0.6906
		2011	4.21	2400	171	0.3450	0.2779	0.4190
		2014	5.58	2400	114	0.2807	0.2064	0.3693
		2015	3.50	2400	108	0.4907	0.3984	0.5837
		2016	1.50	1000	109	0.3853	0.2993	0.4791
		2017	NA	NA	100	0.2900	0.2101	0.3854
		2018	1.45	2000	100	0.2600	0.1840	0.3537
		2019	2.29	2400	115	0.2609	0.1893	0.3479
WI	**Stevens Point**	**20**			**1947**	**0.2861**	**0.2664**	**0.3066**
		2000	NA	NA	81	0.0370	0.0127	0.1033
		2001	NA	NA	8	0.1250	0.0064	0.4709
		2002	NA	NA	36	0.0833	0.0287	0.2183
		2003	NA	NA	21	0.1905	0.0767	0.4000
		2004	NA	NA	109	0.2477	0.1762	0.3364
		2005	NA	NA	85	0.1059	0.0567	0.1891
		2006	NA	NA	20	0.3000	0.1455	0.5190

Survey site information			*I. scapularis* adult density[a]		*B. burgdorferi* s.s. prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak adults/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
		2007	NA	NA	142	0.2394	0.1767	0.3159
		2008	NA	NA	93	0.3118	0.2267	0.4119
		2009	NA	NA	76	0.3816	0.2806	0.4940
		2010	NA	NA	89	0.2809	0.1981	0.3818
		2011	NA	NA	124	0.2984	0.2249	0.3840
		2012	NA	NA	108	0.3426	0.2599	0.4361
		2013	NA	NA	192	0.3542	0.2900	0.4241
		2014	NA	NA	100	0.2900	0.2101	0.3854
		2015	NA	NA	151	0.5033	0.4245	0.5820
		2016	NA	NA	232	0.2629	0.2105	0.3231
		2017	NA	NA	56	0.2679	0.1696	0.3959
		2018	NA	NA	92	0.2500	0.1728	0.3473
		2019	NA	NA	132	0.3106	0.2380	0.3940

[a] Ticks were collected via drag cloth during peak adult activity periods. Site summary densities and area dragged are the median of all years sampled.

[b] To identify *B. burgdorferi* s.s. in *I. scapularis* adults, ticks were tested individually using species specific molecular assays which met the minimum criteria for acceptability according to the Centers for Disease Control and Prevention Guidelines: "Surveillance for *Ixodes scapularis* and pathogens found in this tick species in the United States" (2018). https://www.cdc.gov/ticks/resources/TickSurveillance_Iscapularis-P.pdf. Point estimates and 95% confidence intervals were calculated using the Wilson score interval to account for years with low tick sample sizes.

Supplemental Table 4. *Ixodes scapularis* nymphal density and *A. phagocytophilum* prevalence by year at 10 sampling sites in the Upper Midwest. Site summary information includes total years sampled, median nymphal density, median distance dragged per year, total number of ticks tested, and site prevalence and 95%CI for all years combined.

Survey site information			*I. scapularis* nymph density[a]		*A. phagocytophilum* prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak nymphs/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
MN	**Itasca State Park**	**12**	**0.83**	**2000**	**723**	**0.0733**	**0.0565**	**0.0946**
		2005	0.90	1000	20	0.0000	0.0000	0.1611
		2006	3.33	2400	100	0.0600	0.0278	0.1248
		2007	2.39	800	51	0.0588	0.0202	0.1592
		2008	1.96	2400	102	0.0784	0.0403	0.1472
		2009	0.46	2400	69	0.0435	0.0149	0.1202
		2010	0.63	2400	35	0.0571	0.0158	0.1861
		2011	1.38	2400	82	0.0732	0.0340	0.1506
		2015	1.25	1600	59	0.0339	0.0093	0.1154
		2016	0.50	1200	53	0.1887	0.1059	0.3136
		2017	0.67	2400	48	0.0208	0.0011	0.1090
		2018	0.75	1200	66	0.1364	0.0734	0.2393
		2019	0.75	1600	38	0.0789	0.0272	0.2080
MN	**Camp Ripley**	**11**	**1.54**	**2400**	**892**	**0.0998**	**0.0818**	**0.1212**
		2006	5.21	2400	100	0.0600	0.0278	0.1248
		2007	12.50	1000	49	0.1429	0.0710	0.2667
		2008	1.54	2400	102	0.0980	0.0541	0.1711
		2009	0.38	2400	80	0.2750	0.1892	0.3814
		2010	2.13	2400	89	0.0337	0.0115	0.0945
		2011	1.54	2400	125	0.0720	0.0383	0.1312
		2015	1.30	1000	51	0.0784	0.0309	0.1850
		2016	0.69	1600	58	0.1207	0.0597	0.2288
		2017	0.63	2400	83	0.0723	0.0336	0.1489
		2018	1.57	1400	89	0.1573	0.0961	0.2469
		2019	0.75	2400	66	0.0152	0.0008	0.0810
MN	**Richard J. Dorer Memorial Hardwood State Forest**	**8**	**0.46**	**2000**	**310**	**0.0419**	**0.0247**	**0.0704**
		2006	1.54	2400	89	0.0000	0.0000	0.0414
		2009	0.71	2400	39	0.0000	0.0000	0.0897
		2010	0.38	800	106	0.0943	0.0521	0.1650
		2011	1.13	800	19	0.0000	0.0000	0.1682
		2015	0.42	2400	24	0.0417	0.0021	0.2024
		2016	0.06	1600	6	0.1667	0.0085	0.5635
		2018	0.50	1800	21	0.0476	0.0024	0.2267
		2019	0.18	2200	6	0.0000	0.0000	0.3903
MN	**St. Croix State Park**	**11**	**2.40**	**2300**	**1132**	**0.0557**	**0.0437**	**0.0706**
		2006	3.54	2400	170	0.0647	0.0365	0.1121
		2007	12.00	800	51	0.0000	0.0000	0.0700
		2008	2.04	2400	102	0.0686	0.0336	0.1349

Survey site information			*I. scapularis* nymph density[a]		*A. phagocytophilum* prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak nymphs/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
		2009	0.67	2400	122	0.1475	0.0954	0.2212
		2010	3.10	1000	105	0.0286	0.0098	0.0807
		2011	2.75	2400	137	0.0949	0.0563	0.1556
		2015	0.96	2400	69	0.0000	0.0000	0.0527
		2016	NA	NA	105	0.0000	0.0000	0.0353
		2017	4.25	1600	111	0.0631	0.0309	0.1245
		2018	0.59	2200	62	0.0161	0.0008	0.0859
		2019	1.50	1800	98	0.0306	0.0105	0.0862
WI	**American Legion Northern Highland**	**5**	**2.50**	**3600**	**567**	**0.0406**	**0.0272**	**0.0601**
		2012	3.08	3600	111	0.0360	0.0141	0.0890
		2013	6.44	3600	232	0.0345	0.0176	0.0666
		2014	2.17	3600	78	0.0128	0.0007	0.0691
		2015	2.50	3600	90	0.0778	0.0382	0.1519
		2016	1.62	3450	56	0.0536	0.0184	0.1461
WI	**Big Eau Pleine County Park**	**4**	**10.33**	**3145**	**1827**	**0.0996**	**0.0867**	**0.1142**
		2013	65.70	1760	738	0.1287	0.1065	0.1548
		2015	9.85	4530	445	0.1011	0.0764	0.1326
		2016	4.72	12610	594	0.0657	0.0484	0.0885
		2018	10.80	1000	50	0.0600	0.0206	0.1622
WI	**Black River Falls State Forest**	**8**	**3.70**	**1000**	**734**	**0.0572**	**0.0426**	**0.0764**
		2009	NA	NA	6	0.0000	0.0000	0.3903
		2010	NA	NA	110	0.0636	0.0312	0.1256
		2011	NA	NA	128	0.0078	0.0004	0.0429
		2013	12.10	1000	121	0.0331	0.0129	0.0819
		2014	2.10	1000	103	0.0777	0.0399	0.1458
		2015	3.30	1000	111	0.0180	0.0050	0.0633
		2016	5.60	1000	106	0.1887	0.1256	0.2735
		2018	3.70	1000	49	0.0000	0.0000	0.0727
WI	**Kettle Moraine State Forest-Southern Unit**	**10**	**5.60**	**1000**	**889**	**0.1125**	**0.0934**	**0.1349**
		2009	NA	NA	20	0.1500	0.0524	0.3604
		2010	NA	NA	117	0.1111	0.0661	0.1809
		2011	NA	NA	130	0.0462	0.0213	0.0970
		2012	0.33	2150	7	0.0000	0.0000	0.3543
		2013	9.00	1300	117	0.1111	0.0661	0.1809
		2014	1.80	1000	105	0.0857	0.0457	0.1549
		2015	9.30	1000	124	0.1774	0.1202	0.2540
		2016	2.20	1000	99	0.2121	0.1431	0.3026
		2017	12.40	1000	120	0.0833	0.0459	0.1466
		2018	NA	NA	50	0.0600	0.0206	0.1622
WI	**Flambeau State Forest**	**5**	**1.79**	**2400**	**263**	**0.0494**	**0.0291**	**0.0827**
		2012	1.67	2400	28	0.0000	0.0000	0.1206
		2013	3.83	2400	92	0.0652	0.0302	0.1351

Survey site information			*I. scapularis* nymph density[a]		*A. phagocytophilum* prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak nymphs/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
		2014	0.92	2400	22	0.0455	0.0023	0.2180
		2015	3.25	2400	78	0.0641	0.0277	0.1414
		2016	1.79	2400	43	0.0233	0.0012	0.1206
WI	**McCaslin Brook**	**4**	**2.44**	**2400**	**225**	**0.0267**	**0.0123**	**0.0569**
		2012	0.96	2400	23	0.0000	0.0000	0.1431
		2013	2.46	2400	59	0.0000	0.0000	0.0611
		2014	2.42	2400	58	0.0862	0.0374	0.1864
		2015	2.80	3000	85	0.0118	0.0006	0.0637

[a] Ticks were collected via drag cloth during peak nymphal activity periods. Site summary densities and area dragged are the median of all years sampled.

[b] To identify *A. phagocytophilum* in *I. scapularis* nymphs, ticks were tested individually using species specific molecular assays which met the minimum criteria for acceptability according to the Centers for Disease Control and Prevention Guidelines: "Surveillance for *Ixodes scapularis* and pathogens found in this tick species in the United States" (2018). https://www.cdc.gov/ticks/resources/TickSurveillance_Iscapularis-P.pdf. Point estimates and 95% confidence intervals were calculated using the Wilson score interval to account for years with low tick sample sizes.

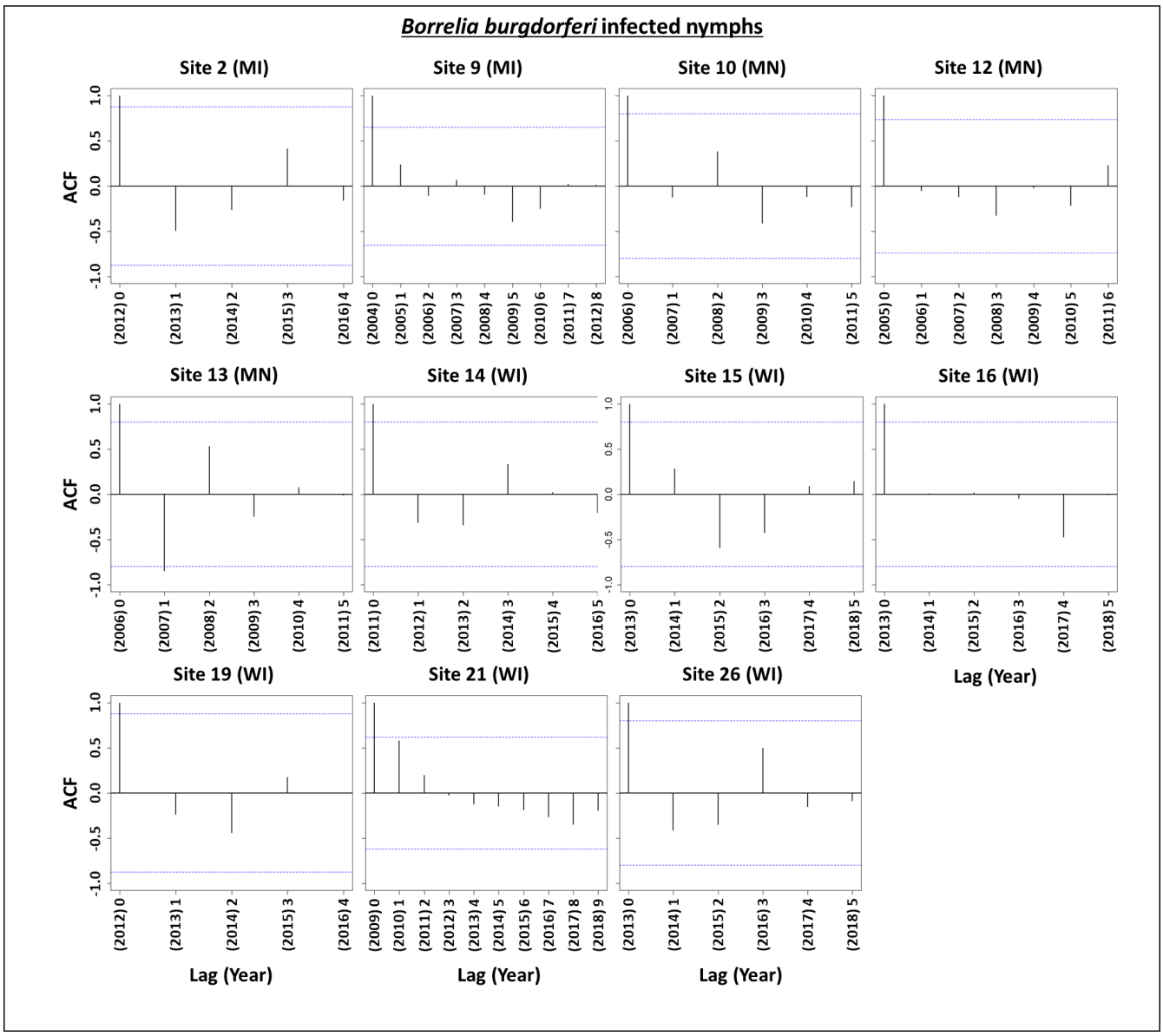
Supplemental Table 5. *Ixodes scapularis* adult density and *A. phagocytophilum* prevalence by year at 5 sampling sites in the Upper Midwest. Site summary information includes total years sampled, median adult density, median distance dragged per year, total number of ticks tested, and site prevalence and 95%CI for all years combined.

Survey site information			*I. scapularis* adult density[a]		*A. phagocytophilum* prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak adults/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
MN	**Itasca State Park**	**13**	**1.73**	**2400**	**1145**	**0.1223**	**0.1045**	**0.1425**
		2005	1.4	1000	41	0.0976	0.0386	0.2255
		2006	1.5	2400	100	0.0900	0.0481	0.1623
		2007	0.75	800	26	0.1538	0.0615	0.3353
		2008	3.17	2400	102	0.0392	0.0154	0.0965
		2009	1.96	2400	98	0.0714	0.0350	0.1402
		2010	0.75	2400	25	0.0800	0.0222	0.2497
		2011	2.25	2400	116	0.1293	0.0800	0.2024
		2014	4.54	2400	110	0.1636	0.1061	0.2439
		2015	2.13	1600	104	0.1442	0.0894	0.2244
		2016	0.54	2400	101	0.1980	0.1320	0.2862
		2017	NA	NA	100	0.1700	0.1089	0.2555
		2018	1.17	1200	103	0.1165	0.0679	0.1927
		2019	2.9	1000	119	0.1092	0.0650	0.1780
MN	**Camp Ripley**	**12**	**3.67**	**2400**	**1218**	**0.0944**	**0.0792**	**0.1121**
		2006	1.33	2400	80	0.1000	0.0515	0.1851
		2007	5.1	1000	48	0.1042	0.0453	0.2217
		2008	4.5	2400	102	0.0490	0.0211	0.1097
		2009	2.54	2400	177	0.0678	0.0392	0.1148
		2010	1	800	27	0.1481	0.0592	0.3248
		2011	3.42	2400	150	0.0800	0.0464	0.1346
		2014	7.21	2400	123	0.0000	0.0000	0.0303
		2015	2.79	2400	99	0.2121	0.1431	0.3026
		2016	3.92	2400	105	0.1429	0.0885	0.2224
		2017	5.75	2400	106	0.1415	0.0877	0.2204
		2018	2.63	2400	100	0.0800	0.0411	0.1500
		2019	5.54	2400	101	0.0990	0.0547	0.1727
MN	**Richard J. Dorer Memorial Hardwood State Forest**	**10**	**1.565**	**2400**	**912**	**0.0428**	**0.0314**	**0.0579**
		2006	1.04	2400	44	0.0000	0.0000	0.0803
		2009	1.13	2400	74	0.0541	0.0212	0.1309
		2010	3.92	2400	115	0.0870	0.0479	0.1527
		2011	3.21	2400	110	0.0182	0.0050	0.0639
		2014	3.42	2400	102	0.0000	0.0000	0.0363
		2015	1.38	2400	95	0.0316	0.0108	0.0888
		2016	0.7	2000	111	0.0721	0.0370	0.1358
		2017	2.67	2400	105	0.0476	0.0205	0.1067
		2018	0.38	2400	45	0.0222	0.0011	0.1157
		2019	1.75	1600	111	0.0541	0.0250	0.1129

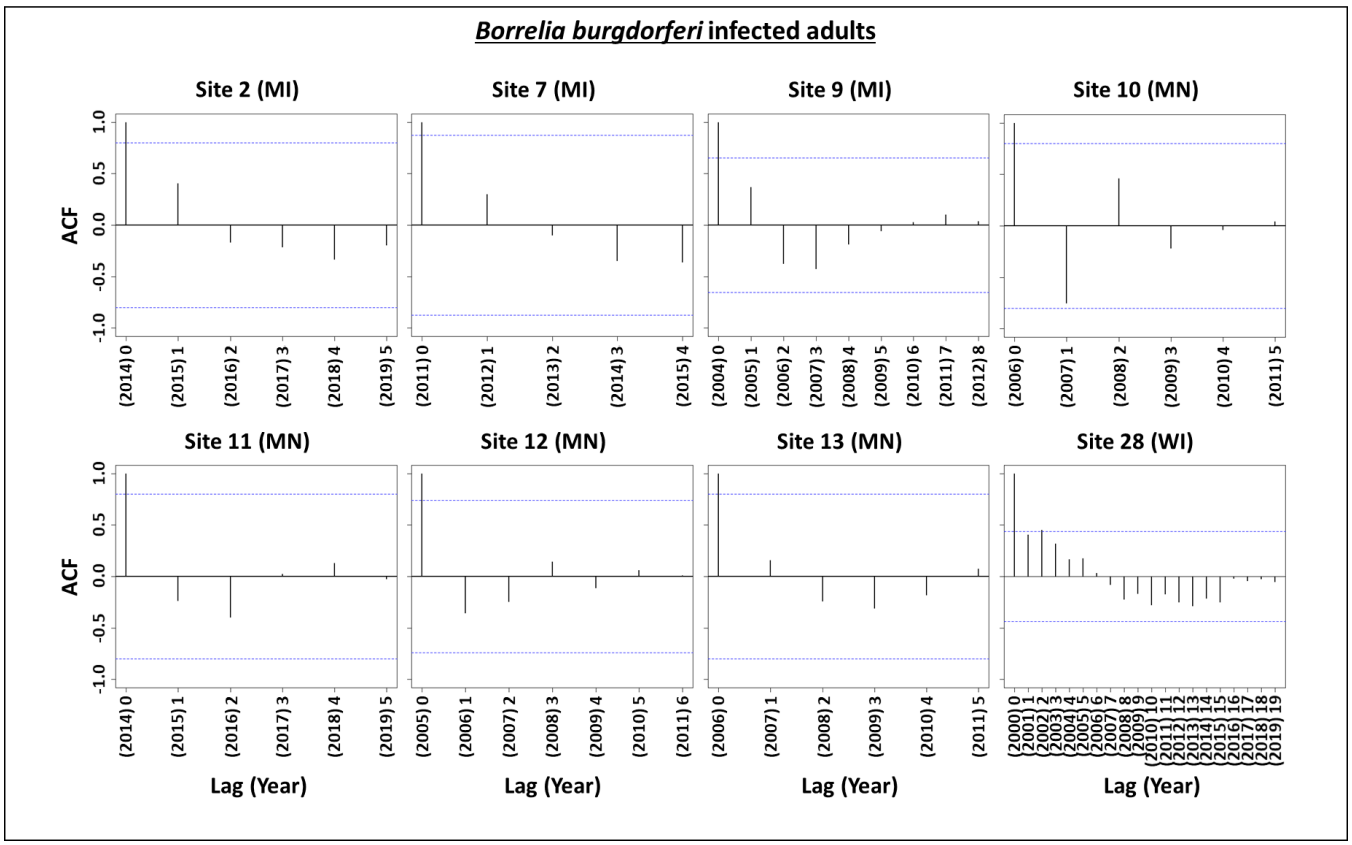
Survey site information			*I. scapularis* adult density[a]		*A. phagocytophilum* prevalence estimate 95% confidence interval[b]			
State	**Site Name**	**Years Sampled**	**Peak adults/ 100m2**	**Area dragged (m2)**	**N ticks tested**	**Point estimate**	**Lower 95CI**	**Upper 95CI**
MN	**St. Croix State Park**	**12**	**2.92**	**2400**	**1291**	**0.0790**	**0.0655**	**0.0950**
		2006	3	2000	130	0.0923	0.0536	0.1544
		2007	1.5	800	40	0.1250	0.0546	0.2611
		2008	3.75	2400	102	0.0098	0.0005	0.0535
		2009	2.92	2400	157	0.0828	0.0490	0.1365
		2010	0.75	2400	45	0.0444	0.0123	0.1483
		2011	4.21	2400	171	0.0936	0.0584	0.1466
		2014	5.58	2400	114	0.0000	0.0000	0.0326
		2015	3.5	2400	108	0.0556	0.0257	0.1159
		2016	1.5	1000	109	0.1193	0.0710	0.1934
		2017	NA	NA	100	0.1300	0.0776	0.2098
		2018	1.45	2000	100	0.0900	0.0481	0.1623
		2019	2.29	2400	115	0.1043	0.0607	0.1736
WI	**Stevens Point**	**20**	**NA**	**NA**	**1815**	**0.0909**	**0.0785**	**0.1050**
		2000	NA	NA	81	0.0000	0.0000	0.0453
		2001	NA	NA	8	0.0000	0.0000	0.3244
		2002	NA	NA	36	0.0000	0.0000	0.0964
		2003	NA	NA	21	0.0000	0.0000	0.1546
		2004	NA	NA	107	0.0280	0.0096	0.0792
		2005	NA	NA	59	0.1186	0.0587	0.2252
		2006	NA	NA	20	0.1000	0.0279	0.3010
		2007	NA	NA	133	0.0451	0.0208	0.0949
		2008	NA	NA	54	0.0556	0.0191	0.1511
		2009	NA	NA	67	0.0448	0.0153	0.1236
		2010	NA	NA	89	0.1910	0.1228	0.2848
		2011	NA	NA	111	0.0901	0.0497	0.1579
		2012	NA	NA	104	0.1635	0.1046	0.2463
		2013	NA	NA	192	0.1615	0.1161	0.2201
		2014	NA	NA	70	0.1286	0.0691	0.2266
		2015	NA	NA	151	0.0530	0.0271	0.1011
		2016	NA	NA	232	0.1034	0.0705	0.1493
		2017	NA	NA	56	0.1071	0.0500	0.2147
		2018	NA	NA	92	0.0761	0.0373	0.1488
		2019	NA	NA	132	0.0909	0.0528	0.1522

[a] Ticks were collected via drag cloth during peak adult activity periods. Site summary densities and area dragged are the median of all years sampled.

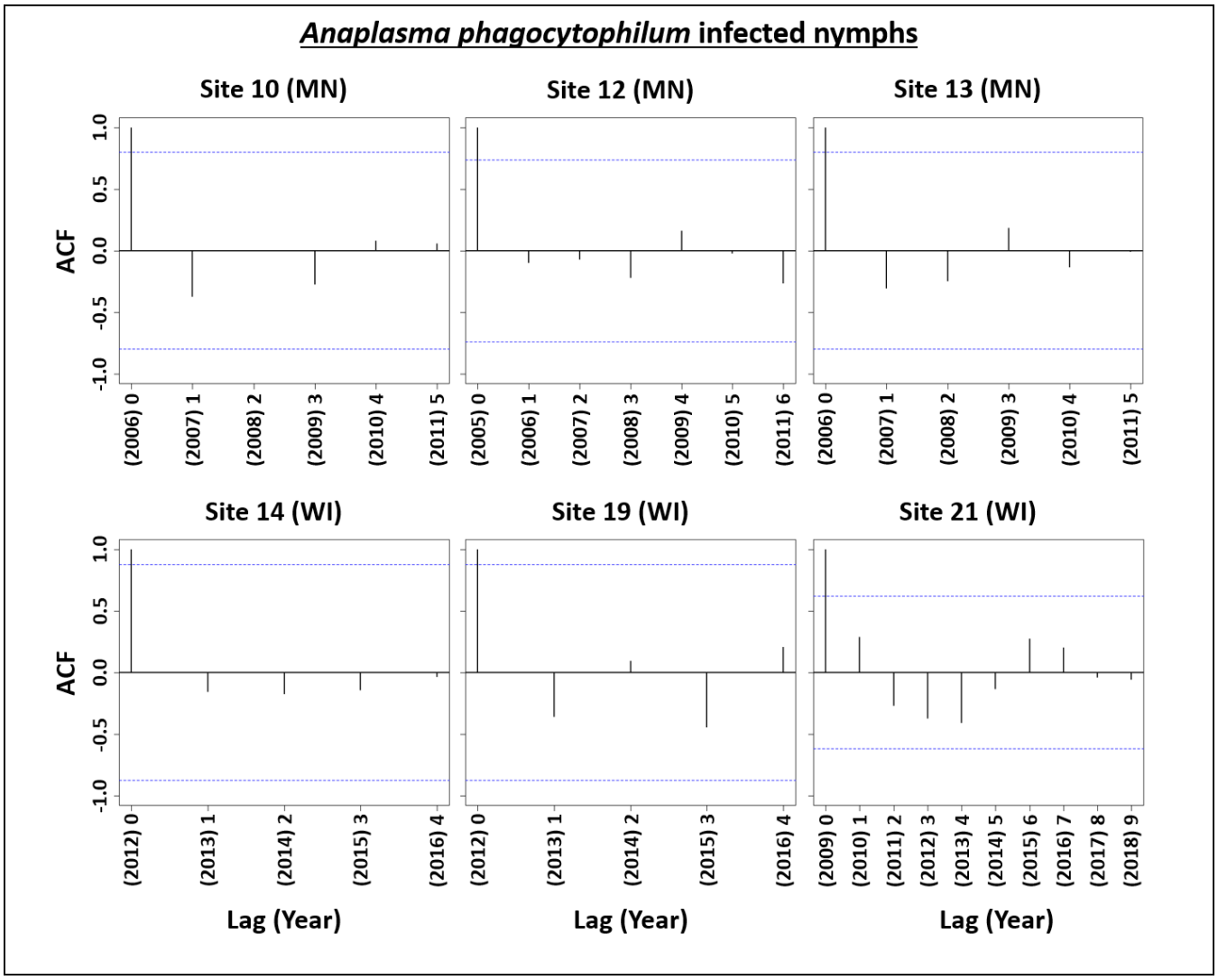
[b] To identify *A. phagocytophilum* in *I. scapularis* adults, ticks were tested individually using species specific molecular assays which met the minimum criteria for acceptability according to the Centers for Disease Control and Prevention Guidelines: "Surveillance for *Ixodes scapularis* and pathogens found in this tick species in the United States" (2018). https://www.cdc.gov/ticks/resources/TickSurveillance_Iscapularis-P.pdf. Point estimates and 95% confidence intervals were calculated using the Wilson score interval to account for years with low tick sample sizes.



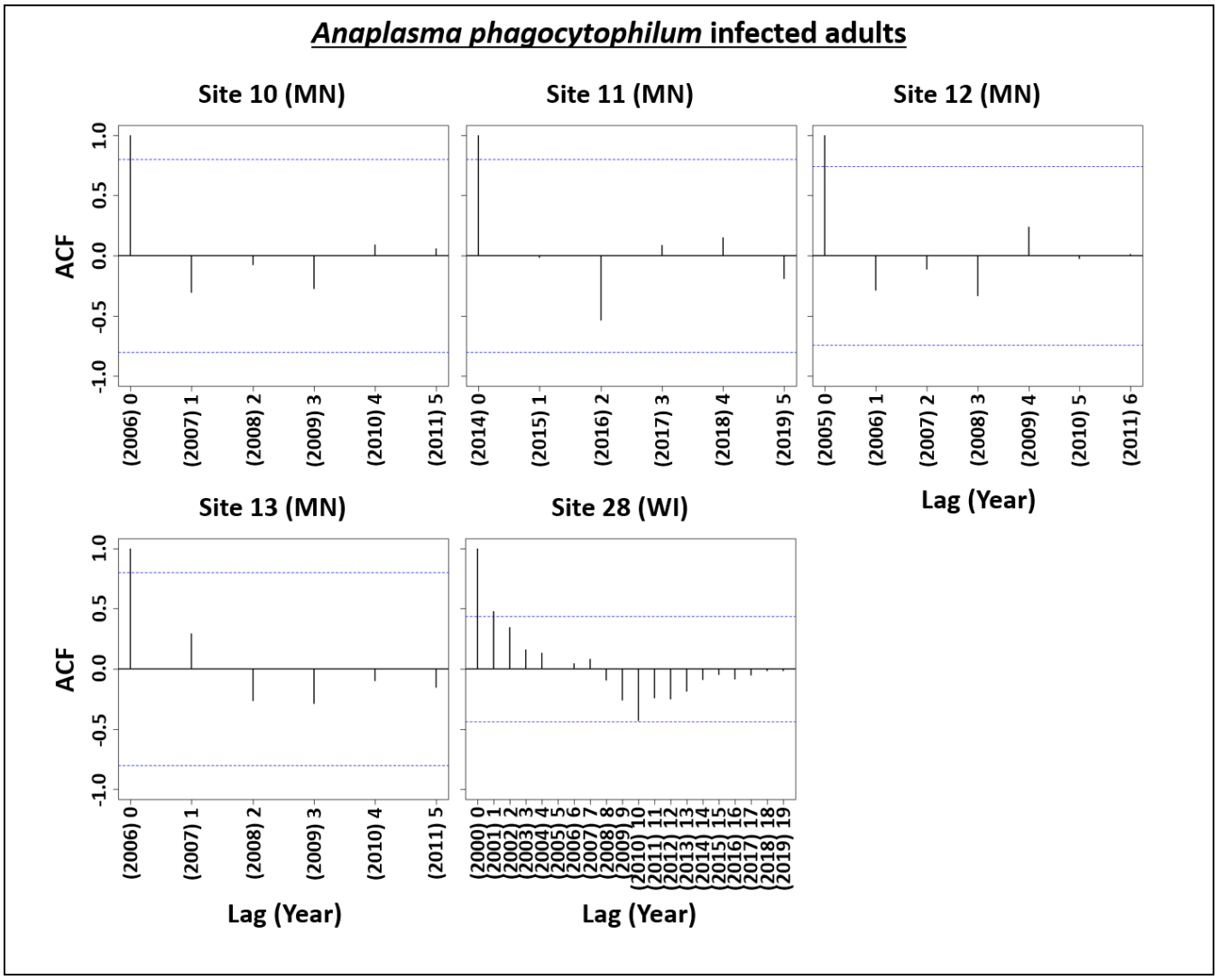
Supplemental Figure 1. Autocorrelation function plots (ACF) for the annual proportion of *I. scapularis* nymphs infected with *B. burgdorferi* s.s. at 11 sites in the Upper Midwest with ≥ 5 contiguous years of data. ACF determines whether infection rate in one year can predict the next. Dotted blue lines represent 95% CI. Any black line (except lag = 0) that crosses the 95% CI indicates temporal autocorrelation.



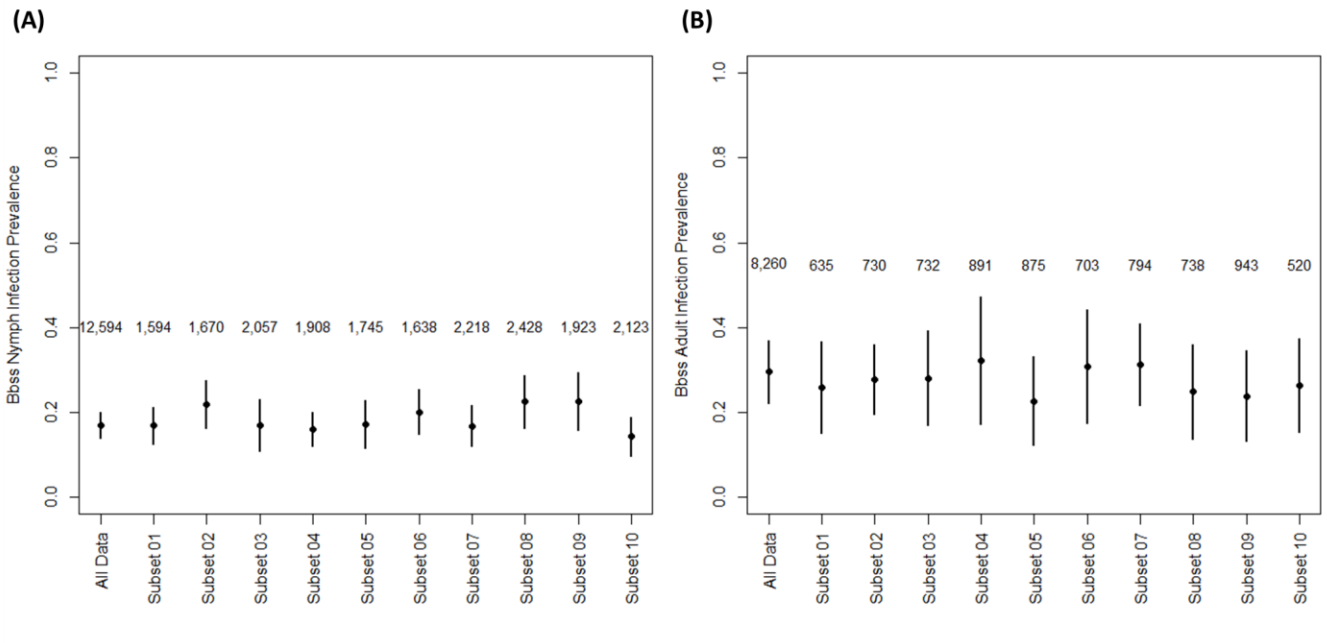
Supplemental Figure 2. Autocorrelation function plots (ACF) for the annual proportion of *I. scapularis* adults infected with *B. burgdorferi* s.s. at 8 sites in the Upper Midwest with ≥ 5 contiguous years of data. ACF determines whether infection rate in one year can predict the next. Dotted blue lines represent 95% CI. Any black line (except lag = 0) that crosses the 95% CI indicates temporal autocorrelation.



Supplemental Figure 3. Autocorrelation function plots (ACF) for the annual proportion of *I. scapularis* nymphs infected with *A. phagocytophilum* at 6 sites in the Upper Midwest with ≥ 5 contiguous years of data. ACF determines whether infection rate in one year can predict the next. Dotted blue lines represent 95% CI. Any black line (except lag = 0) that crosses the 95% CI indicates temporal autocorrelation.



Supplemental Figure 4. Autocorrelation function plots (ACF) for the annual proportion of *I. scapularis* adults infected with *A. phagocytophilum* at 5 sites in the Upper Midwest with ≥ 5 contiguous years of data. ACF determines whether infection rate in one year can predict the next. Dotted blue lines represent 95% CI. Any black line (except lag = 0) that crosses the 95% CI indicates temporal autocorrelation.



Supplemental Figure 5. *B. burgdorferi* s.s. nymph (A) and adult (B) prevalence mean and 95% CI for all sampling years and 10 elimination subsets. The 95% CIs were based upon t-statistics as sample sizes were < 30. The 'All Data' category includes the full dataset with all collection years. For nymphs, each subset contains all 25 sites, but each with only one year of data. For adults, each subset contains all 14 sites. Each of the 10 subsets represents an independent randomized sample from the full data set. The numbers above each figure represent the total number of ticks tested in each subset. There was no significant difference between the full data set and the subsets for nymph according to an ANOVA (df = 10,264; F = 1.26; p = 0.253), or adults (df = 10,143; F = 0.383, p = 0.952). Post hoc Tukey tests for pairwise comparisons also found no significant difference between the full datasets and any of the subsets individually for either nymphs or adults.