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Memo to: Mike Armstrong, Andrew King and Robyn Niver

From: Mark Ford *Mark*

Subject: Kaleidoscope Classifier 5.2.0 running in 5.1.9 on Expanded Data

Below are the returned MLE p -values on the estimates of presence or absence of bat community composition datasets (also with runs of northern long-eared bats *Myotis septentrionalis* removed or Indiana bats *Myotis sodalis* removed) for the 0, -1 and +1 settings over ten independent and randomly generated test libraries as well as associated producer's and user's accuracy (Tables 1-6). Setting 0 would fail for northern long-eared bats and nominally pass for Indiana bats. Setting -1 would pass for northern long-eared bats and fail for Indiana bats. Setting +1 would fail for northern long-eared bats and pass for Indiana bats. Performance for other species bats continues to be problematic.

cc: A. Silvis

Table 1. MLE values at version 5.1.9 using 5.2.0 classifier at setting 0. Red shading indicates unacceptable false positive MLE scoring.

KALEIDOSCOPE 5.1.9															
Bats of North America 5.2.0 S/A: 0		CORTOW	EPTFUS	LASBOR	LASCIN	LASNOC	MYOAUS	MYOGRI	MYOLEI	MYOLUC	MYOSEP	MYOSOD	NYCHUM	PERSUB	
Test 1	all	1	0	0	0	1	1	0	0.033324	0	0	0	0.000093	0	
	no MYSE	1	0	0	0	1	1	0	0.027014	0	0.0435019	0	0.000094	0	
	no MYSO	1	0	0	0	1	1	0	0.000363	0	0	0.1350857	0.000069	0	
Test 2	all	0.087628	0.0000002	0	0	0.89046	1	0	0.04678	0	0.0000004	0.0000013	0.000078	0	
	no MYSE	0.081252	0.0000004	0	0	0.916845	1	0	0.059302	0	1	0.0000132	0.0003744	0	
	no MYSO	0.086878	0.0000003	0	0	0.890878	1	0	0.006383	0	0.0000004	0.0503838	0.0000728	0	
Test 3	all	1	0	0	0	0.962134	1	0	0.11183	0	0	0.0000001	0.0000029	0	
	no MYSE	1	0	0	0	0.962137	1	0	0.109105	0	0.42022	0.0000001	0.0000029	0	
	no MYSO	1	0	0	0	0.962143	1	0	0.003756	0	0	0.357066	0.0000021	0	
Test 4	all	0.164564	0	0	0	1	1	0	0.612081	0	0	0	0.0005029	0	
	no MYSE	0.153891	0	0	0	1	1	0	0.618311	0	1	0	0.0004543	0	
	no MYSO	0.165781	0	0	0	1	1	0	0.029179	0	0	0.2987554	0.0005499	0	
Test 5	all	1	0	0	0	0.840423	1	0	0.245232	0	0	0	0.0000009	0	
	no MYSE	1	0	0	0	0.840422	1	0	0.229921	0	0.0391516	0	0.0000009	0	
	no MYSO	1	0	0	0	0.840442	1	0	0.013121	0	0	0.0309338	0.0000007	0	
Test 6	all	1	0	0	0	1	1	0	0.064671	0	0	0	0.0010946	0	
	no MYSE	1	0	0	0	1	1	0	0.068156	0	0.535867	0	0.0010947	0	
	no MYSO	1	0	0	0	1	1	0	0.000496	0	0	0.2783064	0.0008762	0	
Test 7	all	0.153675	0	0	0	0.892821	1	0	0.164109	0	0	0	0.0000652	0	
	no MYSE	0.151451	0	0	0	0.895458	1	0	0.160984	0	0.0354091	0	0.0000703	0	
	no MYSO	0.152435	0	0	0	0.893827	1	0	0.007557	0	0	0.0080099	0.0000764	0	
Test 8	all	1	0	0	0	0.97567	1	0	0.119378	0	0	0.0000001	0.0001076	0	
	no MYSE	1	0	0	0	0.975672	1	0	0.115556	0	0.0054621	0.0000001	0.0001084	0	
	no MYSO	1	0	0	0	0.975683	1	0	0.004991	0	0	0.2449303	0.0001126	0	
Test 9	all	1	0	0	0	1	1	0	0.001481	0	0	0.0000047	0.0722358	0	
	no MYSE	1	0.0000333	0	0	1	1	2.2E-05	0.036681	0	0.7856842	0.0000037	0.0493607	0	
	no MYSO	1	0.0000332	0	0	1	1	2E-05	0.000607	0	0.0000004	0.7999354	0.0500062	0	
Test 10	all	1	0.0000006	0	0	0.734385	1	0	0.007096	0	0.0000005	0.0002129	0.0022211	0	
	no MYSE	1	0.0000006	0	0	0.734393	1	0	0.007441	0	0.0371622	0.0001523	0.0022382	0	
	no MYSO	1	0.0000006	0	0	0.734421	1	0	5.63E-05	0	0.0000003	0.9368827	0.0023007	0	

Table 2. Producer's and user's accuracy for version 5.1.9 using 5.2.0 classifier setting 0.

	Found (Producer)	SD	Common mis-ID	Found (User)	SD	Common mis-ID
EPTFUS	0.68	0.68	NOID	0.64	0.62	LASNOC
LASBOR	0.54	0.39	NOID	0.75	0.54	NYCHUM/MYOGRI
LASCIN	0.95	0.87	NOISE	0.17	0.19	NOISE
LASNOC	0.3	0.37	NOID/EPTFUS	0.38	0.32	EPTFUS
MYAUS	0	0	NOID	0	0	MYOGRI
MYOGRI	0.35	0.3	NOID	0.42	0.42	MYOSOD
MYOLEI	0.17	0.21	NOID	1	1	MYOSEP/NOID
MYOLUC	0.42	0.3	NOID	0.73	0.53	MYOSEP/NOID
MYOSEP	0.33	0.23	NOID	0.82	0.66	NOID
MYOSOD	0.45	0.37	NOID/MYOLUC	0.66	0.47	MYOLUC/NOID
NYCHUM	0.39	0.39	NOID	0.06	0.27	LASBOR/NOID
PERSUB	0.69	0.52	NOID	0.64	0.52	MYOGRI/NYCHUM

Table 3. MLE values at version 5.1.9 using 5.2.0 classifier at setting -1. Red shading indicates unacceptable false positive MLE scoring.

KALEIDOSCOPE 5.1.9														
Bats of North America 5.2.0 S/A:-1		CORTOW	EPTFUS	LASBOR	LASCIN	LASNOC	MYOAUS	MYOGRI	MYOLEI	MYOLUC	MYOSEP	MYOSOD	NYCHUM	PERSUB
Test 1	all	0.100566	0	0	0	0.3788904	1	0	0.0000002	0	0	0	0.0000001	0
	no MYSE	0.0958604	0	0	0	0.4458882	1	0	0	0	0.2053841	0	0.0000002	0
	no MYSO	0.0998445	0	0	0	0.3845445	1	0	0	0	0	0.0000038	0	0
Test 2	all	0.0000838	0.0014964	0	0	0.2552132	1	0	0.1278781	0	0	0	0.0037774	0.0000341
	no MYSE	0.0000753	0.0014797	0	0	0.2312411	1	0	0.0868258	0	0.2336986	0	0.00247	0.0000242
	no MYSO	0.0000839	0.0015004	0	0	0.261365	1	0	0.04968	0	0	0.0000004	0.0033295	0.0000278
Test 3	all	0.43534	0	0	0	0.2332974	1	0	0	0	0	0	0.0000005	0
	no MYSE	0.4358003	0	0	0	0.201687	0.7298338	0	0.0000003	0	0.3042916	0	0.0000005	0
	no MYSO	0.4359724	0	0	0	0.2157177	0.9693142	0	0	0	0	0.0004599	0.0000004	0
Test 4	all	0.3451878	0	0	0	0.8485511	1	0	0.0000219	0	0	0	0.0000299	0
	no MYSE	0.3417196	0	0	0	0.8252434	0.9106422	0	0.0001326	0	0.8530901	0	0.0000268	0
	no MYSO	0.3411886	0	0	0	0.8213407	1	0	0.0000026	0	0	0.0001589	0.0000215	0
Test 5	all	0.0087661	0.0000005	0	0	0.0752528	1	0	0	0	0	0	0.0000032	0
	no MYSE	0.0082727	0.0000005	0	0	0.0697571	0.6205265	0	0.0000362	0	0.0531787	0	0.0000035	0
	no MYSO	0.008543	0.0000006	0	0	0.0746087	1	0	0	0	0	0.0004356	0.0000038	0
Test 6	all	0.0996034	0	0	0	0.5732741	1	0	0.0000047	0	0	0	0.0007759	0
	no MYSE	0.0931316	0	0	0	0.5818348	0.9999977	0	0.0000067	0	0.119219	0	0.0014298	0
	no MYSO	0.0993856	0	0	0	0.5792234	1	0	0.0000009	0	0	0.0000058	0.0004861	0
Test 7	all	0.001531	0	0	0	0.2685512	1	0	0.0000012	0	0	0	0.0013574	0
	no MYSE	0.0014109	0	0	0	0.2831816	0.9925908	0	0.0000417	0	0.0868189	0	0.0018534	0
	no MYSO	0.0015294	0	0	0	0.2705464	1	0	0	0	0	0.0000014	0.0020971	0
Test 8	all	0.0157142	0	0	0	0.1777866	0.9089668	0	0.0000005	0	0	0	0.0000123	0
	no MYSE	0.0157525	0	0	0	0.1685476	0.458972	0	0.0000041	0	0.1626114	0	0.0000122	0
	no MYSO	0.0159962	0	0	0	0.1762706	0.8060517	0	0.0000002	0	0	0.0007359	0.000016	0
Test 9	all	0.8997358	0	0	0	0.6728856	1	0	0	0	0	0	0.0298507	0.000001
	no MYSE	0.5559784	0.0002659	0	0	0.9520456	1	0	0.000079	0	0.7544295	0	0.004947	0
	no MYSO	0.5804655	0.0003356	0	0	0.9451235	1	0	0.0000002	0	0	0.0181642	0.0022597	0
Test 10	all	0.1096536	0.0005646	0	0	0.162779	1	0	0	0	0	0	0.0000687	0
	no MYSE	0.1019794	0.0003244	0	0	0.2227131	0.9322783	0	0.0000005	0	0.2052197	0	0.0001031	0
	no MYSO	0.1088948	0.0005596	0	0	0.1692171	1	0	0	0	0	0.1364282	0.0000946	0

Table 4. Producer's and user's accuracy for version 5.1.9 using 5.2.0 classifier setting -1.

	Found (Producer)	SD	Common mis-ID	Found (User)	SD	Common mis-ID
EPTFUS	0.74	0.67	LASCIN	0.58	0.53	LASNOC
LASBOR	0.56	0.38	NYCHUM	0.59	0.39	NYCHUM
LASCIN	0.95	0.87	NOISE	0.11	0.15	NOISE
LASNOC	0.53	0.37	EPTFUS	0.38	0.28	CORTOW/EPTFUS
MYAUS	0.00	0.00	MYOSOD	0.00	0.00	MYOGRI/MYOSOD
MYOGRI	0.94	0.90	NOID/NOISE	0.39	0.50	NOID
MYOLEI	0.33	0.33	MYOSEP/MYOSOD	0.65	0.46	MYOGRI/MYOSEP
MYOLUC	0.64	0.39	MYOSOD	0.66	0.45	MYOSOD/MYOSEP
MYOSEP	0.73	0.53	NOISE	0.62	0.49	MYOLEI
MYOSOD	0.61	0.48	MYOLUC	0.47	0.41	MYOLUC
NYCHUM	0.82	0.64	LASBOR	0.43	0.24	LASBOR
PERSUB	0.79	0.62	NOISE/NYCHUM	0.58	0.48	MYOGRI

Table 5. MLE values at version 5.1.9 using 5.2.0 classifier at setting +1. Red shading indicates unacceptable false positive MLE scoring.

KALEIDOSCOPE 5.1.9															
Bats of North America 5.2.0 S/A:+1		CORTOW	EPTFUS	LASBOR	LASCIN	LASNOC	MYOAUS	MYOGRI	MYOLEI	MYOLUC	MYOSEP	MYOSOD	NYCHUM	PERSUB	
Test 1	all	1	0.0000158	0	0	1	1	0	0.020408	0	0	0.0000054	0.001331	0	
	no MYSE	1	0.0000157	0	0	1	1	0	0.021575	0	0.0243068	0.0000031	0.001342	0	
	no MYSO	1	0.0000157	0	0	1	1	0	0.000223	0	0	0.6650804	0.001389	0	
Test 2	all	0.032639	0.0449969	0	0	1	1	0	0.03475	0	0.0000001	0.0001197	0.04373	0	
	no MYSE	0.031069	0.0526401	0	0	1	1	0	0.049809	0	1	0.0001253	0.077196	0	
	no MYSO	0.032364	0.0480023	0	0	1	1	0	0.003147	0	0	0.4329168	0.050918	0	
Test 3	all	1	0	0	0	1	1	0	0.049043	0	0	0.0002785	0.018757	0	
	no MYSE	1	0	0	0	1	1	0	0.053447	0	0.3883956	0.0001241	0.018872	0	
	no MYSO	1	0	0	0	1	1	0	0.001369	0	0	0.8928121	0.019401	0	
Test 4	all	0.110602	0.0000001	0	0	1	1	0	0.353001	0	0	0	0.014756	0	
	no MYSE	0.08627	0.0000001	0	0	1	1	0	0.379758	0	1	0	0.01551	0	
	no MYSO	0.109066	0.0000001	0	0	1	1	0	0.009056	0	0	1	0.016768	0	
Test 5	all	1	0.0000001	0	0	1	1	0	0.091448	0	0	0.0000044	0.001645	0	
	no MYSE	1	0.0000001	0	0	1	1	0	0.097552	0	0.027515	0.0000018	0.001645	0	
	no MYSO	1	0.0000001	0	0	1	1	0	0.002989	0	0	0.5776033	0.001727	0	
Test 6	all	1	0	0	0	1	1	1E-07	0.030995	0	0	0.0000004	0.038961	0	
	no MYSE	1	0	0	0	1	1	1E-07	0.033441	0	0.4891165	0.0000002	0.038965	0	
	no MYSO	1	0	0	0	1	1	1E-07	0.000298	0	0	0.5764677	0.039459	0	
Test 7	all	0.086255	0.0000047	0	0	1	1	0	0.085007	0	0	0.0000001	0.014225	0	
	no MYSE	0.086261	0.0000048	0	0	1	1	0	0.091059	0	0.0270307	0	0.014299	0	
	no MYSO	0.086042	0.0000048	0	0	1	1	0	0.003538	0	0	0.1899869	0.015037	0	
Test 8	all	1	0	0	0	1	1	0	0.068748	0	0	0.0000352	0.008983	0	
	no MYSE	1	0	0	0	1	1	0	0.072836	0	0.0038202	0.0000183	0.009042	0	
	no MYSO	1	0	0	0	1	1	0	0.002109	0	0	0.7321029	0.009368	0	
Test 9	all	1	0	0	0	1	1	0	0.001444	0	0	0.0004225	0.508207	0	
	no MYSE	1	0.0084327	0	0	1	1	0.000605	0.04622	0	0.7583502	0.000196	0.376521	0	
	no MYSO	1	0.0084207	0	0	1	1	0.000581	0.000357	0	0	1	0.379728	0	
Test 10	all	1	0.0019419	0	0	1	1	0	0.002245	0	0	0.0214883	0.061745	0	
	no MYSE	1	0.0019399	0	0	1	1	0	0.00241	0	0.0226155	0.0162937	0.062161	0	
	no MYSO	1	0.0019314	0	0	1	1	0	8.8E-06	0	0	1	0.064515	0	

Table 6. Producer's and user's accuracy for version 5.1.9 using 5.2.0 classifier setting +1.

	Found (Producer)	SD	Common mis-ID	Found (User)	SD	Common mis-ID
EPTFUS	0.32	0.29	NOID	0.65	0.63	LASNOC
LASBOR	0.52	0.38	NOID	0.77	0.60	NYCHUM
LASCIN	0.95	0.87	NOISE	0.24	0.25	NOISE
LASNOC	0.25	0.40	EPTFUS	0.59	0.41	EPTFUS
MYAUS	0.00	0.00	NOID	0.00	0.00	MYOLUC/MYOSOD
MYOGRI	0.32	0.26	NOID	0.53	0.48	NOID
MYOLEI	0.17	0.22	NOID	1.00	1.00	MYOGRI
MYOLUC	0.42	0.28	NOID	0.73	0.52	MYOSOD/NOID
MYOSEP	0.32	0.24	NOID	0.82	0.66	NOID
MYOSOD	0.34	0.33	NOID	0.73	0.54	MYOLUC/NOID
NYCHUM	0.39	0.39	NOID	0.07	0.30	LASBOR
PERSUB	0.65	0.50	NOID	0.64	0.53	MYOGRI