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Memo to: Mike Armstrong, Andrew King and Robyn Niver

From: Mark Ford *Mark*

Subject: Kaleidscope 4.0.0

Contained are the results of the recently submitted Kaleidscope version 4.0.0 modification for the New York and West Virginia echolocation datasets. Again, per the request of the vendor, we ran this program only on the -1 “most sensitive” setting. Based on U.S. Fish and Wildlife standards set forth for testing on the simulated full community New York dataset and West Virginia dataset, the more sensitive -1 setting of 4.0.0 **passed** for northern long-eared bats (*Myotis septentrionalis*) and Indiana bats (*Myotis sodalis*; Table 1) by denoting strong likelihood of presence when in fact they were present in the test dataset. This version produced identical bat classification and MLE results as that of previously approved version 3.1.7 as no changes were been made to the classification algorithms or MLE calculations. When northern long-eared bats were removed from the data, the submitted software correctly showed the species to not be present with confidence with only 2 and 1 passes assigned to northern long-eared bats in the New York and West Virginia datasets, respectively. However, when Indiana bats were removed, the software provided incorrect false positives for New York ( $p = 0.0002$ ) with 14 passes identified as such and for West Virginia ( $p = 0.0008$ ) with 12 passes identified as such. As was noted with 3.1.7, further work to address false positive rates for Indiana bats should be a priority in future software versions.

cc: A. Silvis

Table 1. Comparison of post-identification per species confidence ( $p$ ) from maximum likelihood estimator (see program specifications for details) of known echolocation pulses for Kaleidoscope 4.0.0 on the more sensitive setting (-1) for simulated New York and West Virginia datasets based on Ford et al. (2011, 2005).

<b>Species New York</b>	<b><math>p</math>-value</b>	<b>actually present</b>	<b>identified by software</b>	<b>sensitivity</b>	<b>specificity</b>
EPFU	0	28	26	0.92308	0.98113
LABO	0	51	58	1	0.86574
LACI	0	21	22	0.95455	1
LANO	1	9	6	0.60000	0.98684
MYLE	0.00045	7	5	0.55556	0.99127
MYLU	0	68	53	0.65934	0.94558
MYSE	0.00003	14	18	0.70588	0.99095
MYSO	0	32	31	0.66667	0.93365
PESU	0.00147	8	11	0.80000	1
<b>Species West Virginia</b>	<b><math>p</math>-value</b>	<b>actually present</b>	<b>identified by software</b>	<b>sensitivity</b>	<b>specificity</b>
EPFU	0	26	28	0.92308	0.99024
LABO	0	58	51	0.94872	0.90625
LACI	0	22	21	0.95455	0.99521
LANO	1	6	9	0.60000	0.98673
MYLE	0.01307	5	7	0.22222	0.98649
MYLU	0	54	68	0.66667	0.90643
MYSE	0	19	14	0.81818	0.99522
MYSO	0	31	32	0.70370	0.94118
PESU	0.00002	11	8	0.66667	0.99537