

Fig. S1. Waterfall plot of all call power spectra from control trials. With the possible exception of a modest relative deemphasis of the spectral peak at ≈ 43 kHz at very high source levels, no significant changes occur in the spectrum across the range of source levels emitted in control trials ($n = 5205$).

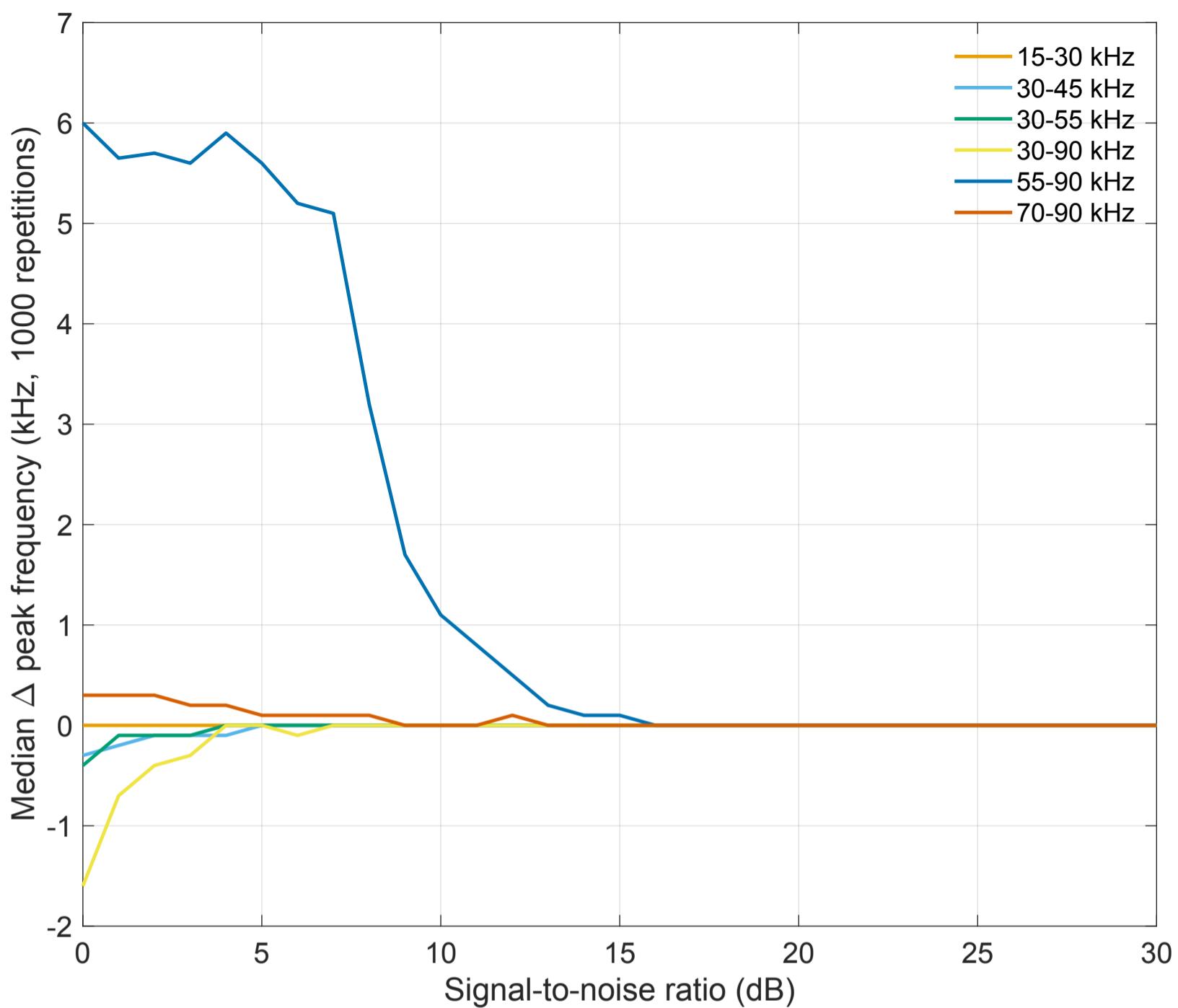


Fig. S2. Median Δ peak frequency estimate before and after artificially layering noise. The efficacy of the FFT-filter noise removal remains high for 5 of the 6 noise-bands down to an SNR of \approx 5 dB, but tapers off at \approx 15 dB for the 55-90 kHz noise. For all treatments, the median threshold for when deviations in estimated peak frequencies occur is well below average SNR (**Fejl! Henvisningskilde ikke fundet.**).

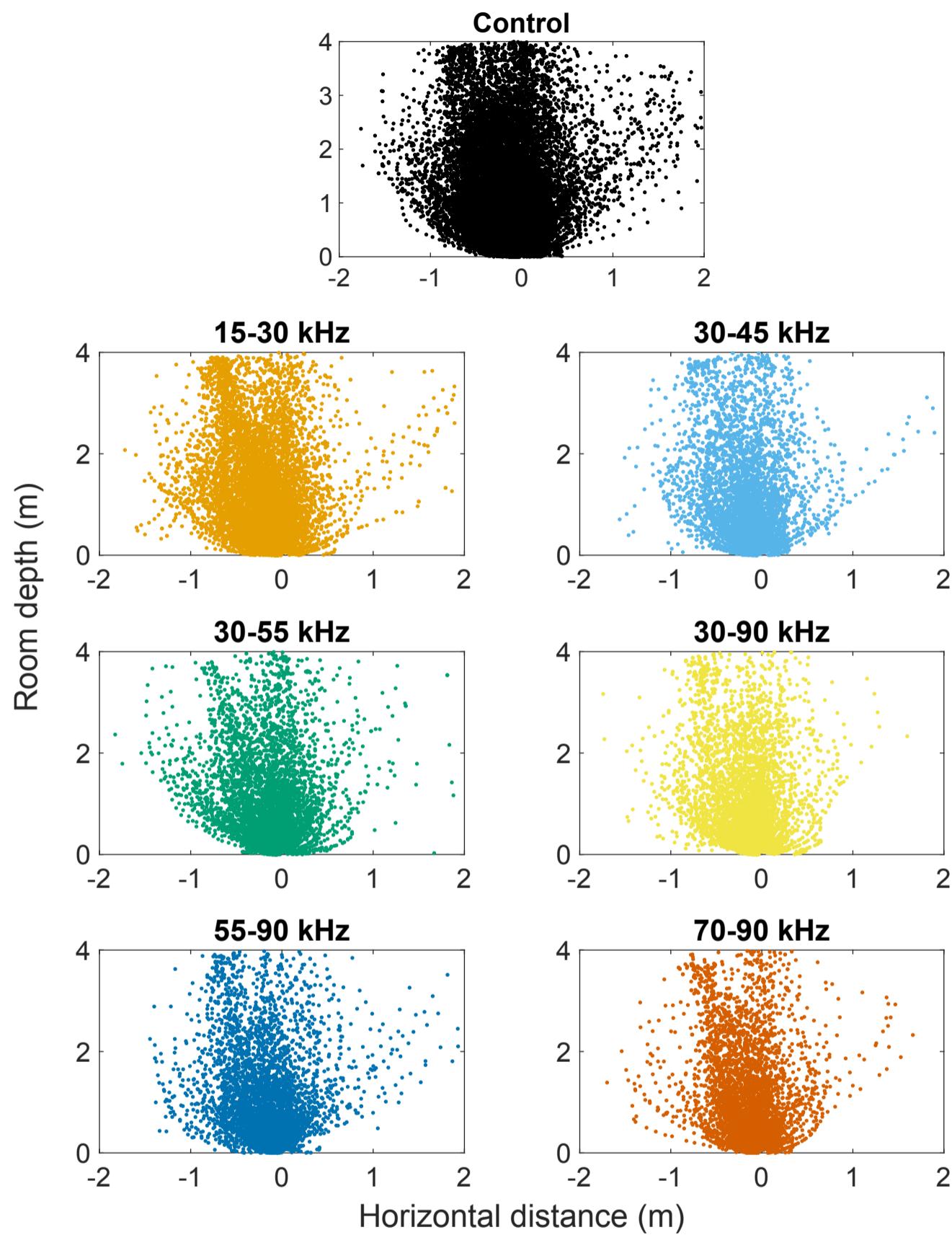


Fig. S3. Localized tracks of all flight paths. The bats directly approach the target (coordinates 0,0) and the path chosen does not deviate from control across treatments.

Table S1. Statistical models for changes in Source level when exposed to masking noise.

Model <- SL ~ noiseband + $\log_{10}(\text{distance})$ + animal + noise level:noiseband + (1 date/event)				
Covariates	Estimate \pm s.e.m.	df	t-value	p-value
Intercept (15-30 kHz, bat #1)	102.99 \pm 0.31	257.44	329.738	< 2·10 ⁻¹⁶
30-45 kHz	-1.08 \pm 0.36	2177.49	-2.963	3.08·10 ⁻³
30-55 kHz	-1.67 \pm 0.36	2177.52	-4.601	4.438·10 ⁻⁶
30-90 kHz	-2.48 \pm 0.36	2177.88	-6.792	1.4231·10 ⁻¹¹
55-90 kHz	-0.93 \pm 0.36	2177.80	-2.585	9.8·10 ⁻³
70-90 kHz	-0.18 \pm 0.37	2178.21	-0.485	0.62761
$\log_{10}(\text{distance})$	11.38 \pm 0.15	10613.74	77.401	< 2·10 ⁻¹⁶
Bat #2	-1.65 \pm 0.16	2182.93	-10.484	< 2·10 ⁻¹⁶
Bat #3	-1.15 \pm 0.156	2185.28	-7.408	1.83·10 ⁻¹³
Bat #4	-0.37 \pm 0.16	2186.57	-2.363	1.822·10 ⁻²
Bat #5	-0.98 \pm 0.16	2184.99	-6.111	5.8162·10 ⁻¹⁰
15-30 kHz : noise level	0.05 \pm 0.005	2190.82	11.368	< 2·10 ⁻¹⁶
30-45 kHz : noise level	0.12 \pm 0.005	2179.00	24.793	< 2·10 ⁻¹⁶
30-55 kHz : noise level	0.15 \pm 0.005	2178.32	32.202	< 2·10 ⁻¹⁶
30-90 kHz : noise level	0.17 \pm 0.005	2179.50	36.473	< 2·10 ⁻¹⁶
55-90 kHz : noise level	0.10 \pm 0.005	2178.23	22.488	< 2·10 ⁻¹⁶
70-90 kHz : noise level	0.06 \pm 0.005	2178.36	12.364	< 2·10 ⁻¹⁶

Table S2. Contrasts in slopes across noise treatments. Results are averaged over the levels of: animal & noise level. P-values are adjusted with the Tukey method for comparing a family of 6 estimates.

model.trends<-ltrends(mymodel, "noiseband", var="noiseflevel")				
Contrasts	Estimate \pm s.e.m.	df	t-ratio	p-value
15-30 kHz : 30-45 kHz	-0.06 \pm 0.007	2182	-9.814	<.0001
15-30 kHz : 30-55 kHz	-0.099 \pm 0.007	2182	-15.186	<.0001
15-30 kHz : 30-90 kHz	-0.12 \pm 0.007	2182	-18.325	<.0001
15-30 kHz : 55-90 kHz	-0.05 \pm 0.007	2182	-8.033	<.0001
15-30 kHz : 70-90 kHz	-0.008 \pm 0.007	2183	-1.183	0.8450
30-45 kHz : 30-55 kHz	-0.04 \pm 0.007	2177	-5.319	<.0001
30-45 kHz : 30-90 kHz	-0.06 \pm 0.007	2177	-8.438	<.0001
30-45 kHz : 55-90 kHz	0.01 \pm 0.007	2177	1.804	0.4631
30-45 kHz : 70-90 kHz	0.06 \pm 0.007	2177	8.463	<.0001
30-55 kHz : 30-90 kHz	-0.02 \pm 0.007	2177	-3.121	0.0225
30-55 kHz : 55-90 kHz	0.05 \pm 0.007	2177	7.146	<.0001
30-55 kHz : 70-90 kHz	0.09 \pm 0.007	2177	13.734	<.0001
30-90 kHz : 55-90 kHz	0.07 \pm 0.007	2177	10.275	<.0001
30-90 kHz : 70-90 kHz	0.11 \pm 0.007	2177	16.822	<.0001
55-90 kHz : 70-90 kHz	0.04 \pm 0.007	2177	6.709	<.0001

Table S3. Statistical models for changes in half-power onset and terminal frequencies when exposed to masking noise.

-3dB onset frequency \sim noiseband + animal + (1 date/event)				
	Mean \pm s.e.m	df	t-ratio	p-value
Intercept (Control trials, bat #1)	71.32 \pm 0.27	61.78	265.25	$<2 \cdot 10^{-16}$
15-30 kHz	-0.83 \pm 0.31	2232.31	-2.65	0.008
30-45 kHz	-3.98 \pm 0.33	2285.20	-12.21	$<2 \cdot 10^{-16}$
30-55 kHz	-3.16 \pm 0.33	2275.86	-9.58	$<2 \cdot 10^{-16}$
30-90 kHz	-3.17 \pm 0.33	2275.77	-9.63	$<2 \cdot 10^{-16}$
55-90 kHz	-1.98 \pm 0.33	2274.94	-5.99	$2.4 \cdot 10^{-9}$
70-90 kHz	-2.57 \pm 0.33	1174.78	-7.79	$1.05 \cdot 10^{-14}$
Bat #2	-0.55 \pm 0.28	2270.12	-1.95	0.051
Bat #3	-3.56 \pm 0.28	2268.12	-12.7	$<2 \cdot 10^{-16}$
Bat #4	-6.05 \pm 0.28	2268.33	-21.23	$<2 \cdot 10^{-16}$
Bat #5	-2.45 \pm 0.28	2269.08	-8.607	$<2 \cdot 10^{-16}$
-3dB terminal frequency \sim noiseband + animal + (1 date/event)				
	Mean \pm s.e.m	df	t-ratio	p-value
Intercept (Control trials, bat #1)	56.98 \pm 0.19	236.39	305.09	$<2 \cdot 10^{-16}$
15-30 kHz	-0.68 \pm 0.25	1439.42	-2.67	$7.72 \cdot 10^{-3}$
30-45 kHz	-2.29 \pm 0.27	2282.71	-8.47	$<2 \cdot 10^{-16}$
30-55 kHz	-1.28 \pm 0.27	2282.97	-4.68	$3.02 \cdot 10^{-6}$
30-90 kHz	-1.51 \pm 0.27	2282.96	-5.51	$3.95 \cdot 10^{-8}$
55-90 kHz	-0.87 \pm 0.27	2282.54	-3.17	$1.53 \cdot 10^{-3}$
70-90 kHz	-1.84 \pm 0.27	2282.24	-6.72	$2.25 \cdot 10^{-11}$
Bat #2	-0.45 \pm 0.24	2270.33	-1.90	0.058
Bat #3	-1.11 \pm 0.24	2266.27	-4.74	$2.22 \cdot 10^{-6}$
Bat #4	-2.01 \pm 0.24	2267.72	-8.51	$<2 \cdot 10^{-16}$
Bat #5	-1.03 \pm 0.24	2268.46	-4.36	$1.39 \cdot 10^{-5}$