

Figure S1.

Recording of stimuli at the experimental site from the position of the bird. Spectra shown are (A) the broadband pulse and tones at 1, 2 and 4 kHz (B, C, and D respectively).

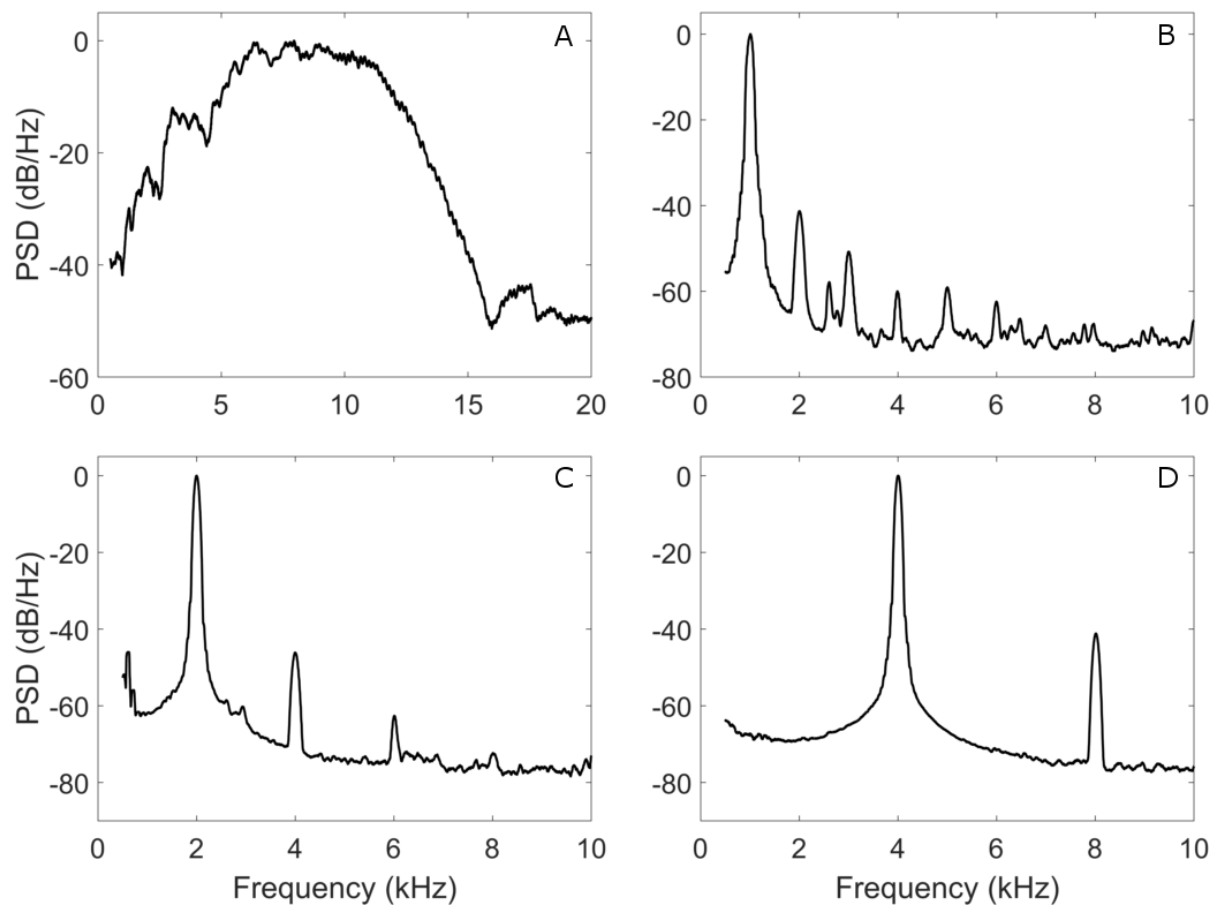


Figure S2.

Audiograms data for 9 Atlantic puffins showing individuals by color. Individual variability is notable.

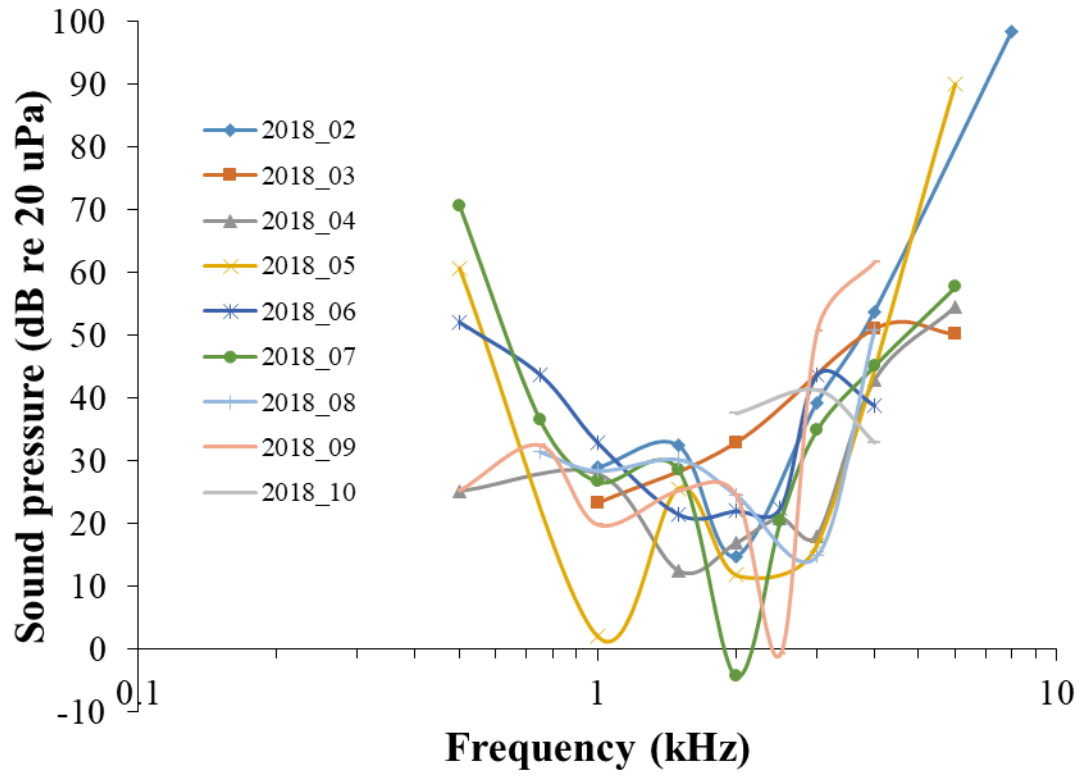


Figure S3.

Comparative audiograms of multiple bird taxa using (A) AEP methods, and (B) a broader array of physiological methods including AEPs and cochlear action potentials. References for the audiograms include: (Beatini et al., 2018; Brittan-Powell et al., 2002; Brittan-Powell et al., 2005; Chen et al., 1993; Crowell et al., 2015; Gleich et al., 1995; Gummer et al., 1987; Köppl and Gleich, 2007; Larsen et al., 2020).

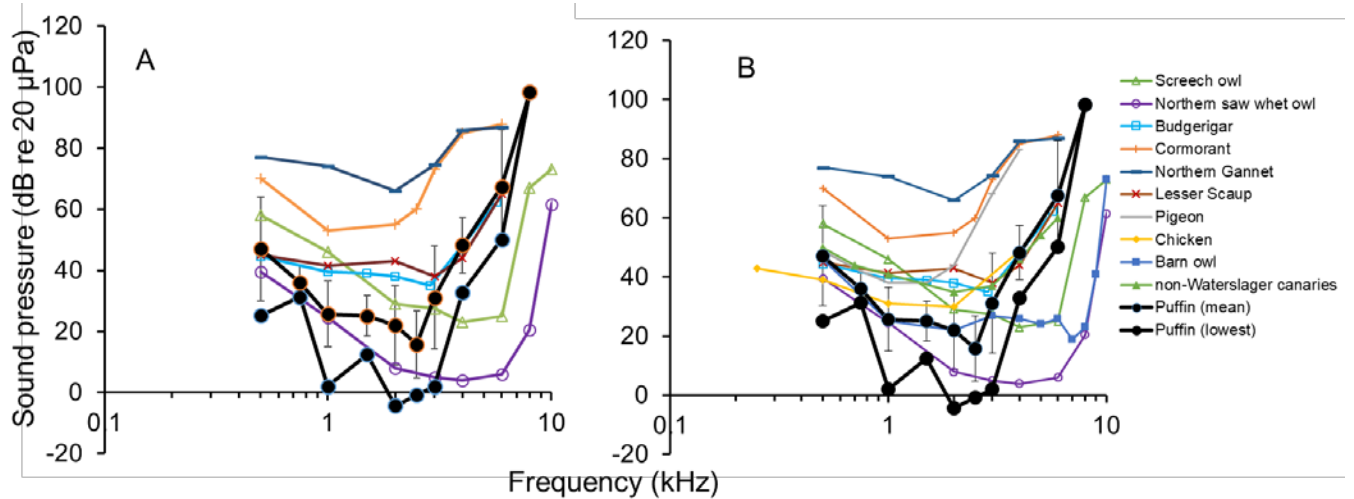


Table S1. Hearing thresholds and meta data of animals and hearing experiment.

Animal ID (inc year)	Fa2018_01	Fa2018_02	Fa2018_03	Fa2018_04	Fa2018_05	Fa2018_06	Fa2018_07	Fa2018_08	Fa2018_09	Fa2018_10	Mean
Weight	550	550	450	450	485	510	540	480	590	530	514
Total handling time (HH:MM)	1:25	3:59	2:11	2:48	2:19	3:06	2:49	2:19	2:36	2:13	3:52 (2:34)
Total audiogram time (1st to last record)	0:44	1:45	1:15	1:37	1:13	1:45	1:31	1:12	1:25	0:46	1:34 (1:19)
Hearing test frequency (kHz)	Hearing thresholds (dB re 20 uPa)										
0.5		NR	NR	17.0	50.3	52.0	70.7		45.5		47.1
0.75						43.6	43.6	31.4	12.2		32.7
1		28.9	25.7	10.8	27.9	32.8	41.9	2.0	39.9		26.3
1.5		32.4		6.6	25.6	21.4	32.4	12.5	19.9		21.6
2		14.8	22.0	13.1	23.2	22.0	39.3	-4.3	43.6	43.6	24.1
2.5				11.1		22.5	22.5		23.3		19.8
3		39.2		16.9	37.0	43.6	50.6	2.1	48.5	48.5	35.8
4		53.6	48.2	9.2		38.8	61.7	32.9	28.8	28.8	37.7
6			67.5	18.6	57.7	NR	90.0	NR	NR	NR	58.4
8		98.4									98.4
click	29.0	5.0	15.4	2.4	5.9	8.7	-15.9	2.6	4.0	4.3	6.1

**Beatini, J. R., Proudfoot, G. A. and Gall, M. D.** (2018). Frequency sensitivity in Northern saw-whet owls (*Aegolius acadicus*). *Journal of Comparative Physiology A* **204**, 145-154.

**Brittan-Powell, E. F., Dooling, R. J. and Gleich, O.** (2002). Auditory brainstem responses (ABR) in adult budgerigars (*Melopsitacus undulatus*). *Journal of the Acoustical Society of America* **112**, 999-1008.

**Brittan-Powell, E. F., Lohr, B., Hahn, D. C. and Dooling, R. J.** (2005). Auditory brainstem responses in the eastern screech owl: an estimate of auditory thresholds. *The Journal of the Acoustical Society of America* **118**, 314-321.

**Chen, L., Salvi, R. and Hashino, E.** (1993). Recovery of CAP threshold and amplitude in chickens following kanamycin ototoxicity. *Hearing Research* **69**, 15-24.

**Crowell, S. E., Wells-Berlin, A. M., Carr, C. E., Olsen, G. H., Therrien, R. E., Yannuzzi, S. E. and Ketten, D. R.** (2015). A comparison of auditory brainstem responses across diving bird species. *Journal of Comparative Physiology A* **201**, 803-815.

**Gleich, O., Klump, G. M. and Dooling, R. J.** (1995). Peripheral basis for the auditory deficit in Belgian Waterslager canaries (*Serinus canarius*). *Hearing Research* **82**, 100-108.

**Gummer, A. W., Smolders, J. W. and Klinke, R.** (1987). Basilar membrane motion in the pigeon measured with the Mössbauer technique. *Hearing Research* **29**, 63-92.

**Köppl, C. and Gleich, O.** (2007). Evoked cochlear potentials in the barn owl. *Journal of Comparative Physiology A* **193**, 601-612.

**Larsen, O. N., Wahlberg, M. and Christensen-Dalsgaard, J.** (2020). Amphibious hearing in a diving bird, the great cormorant (*Phalacrocorax carbo sinensis*). *Journal of Experimental Biology* **223**, jeb217265.