

Noise as a global change driver: a meta-analysis of its fitness consequences for birds

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Abstract

Anthropogenic noise is a widespread yet underappreciated global pollutant. Despite mounting evidence that noise may affect the physiology and behaviour of birds, its consequences for fitness, and thus its capacity to impact population and evolutionary processes, remain unclear. Here, we conduct a pre-registered systematic review and meta-analysis of the causal effects of anthropogenic noise on avian fitness, both at the mean and variance levels. We synthesised 535 effect sizes from 53 experimental studies (45 species) published between 1990 and 2024. Our results demonstrate that overall, avian fitness is reduced by noise exposure, with a consistent negative impact observed across various direct and indirect fitness measures. This suggests that the consequences of noise exposure are not limited to a single behavioural or physiological pathway. Effects were stronger when exposure occurred before fledging, suggesting that the early juvenile life stage is a particularly sensitive window. Notably, the magnitude of the effects depended on the ecological realism of the experimental exposure: realistic anthropogenic noise led to stronger negative effects than synthetic or acoustically unrealistic stimuli. This finding highlights the importance of reproducing the acoustic conditions that animals encounter in their natural environments when assessing the consequences of sensory pollution. In contrast, fitness effects were not consistently related to noise level or exposure duration, suggesting that the biological consequences of noise cannot be understood from noise dosage alone. By demonstrating that anthropogenic noise can reduce avian fitness independently of other environmental stressors, and suggesting that anthropogenic noise may also lead to an increase in variance in direct fitness (i.e., the opportunity for selection), our synthesis establishes noise pollution as a crucial aspect of ecological change. Consequently, anthropogenic noise should be considered alongside more conspicuous drivers of global change as a potentially important force affecting the performance, persistence, and dynamics of wildlife populations.

Keywords: noise pollution, acoustic pollution, human-induced rapid environmental change, sensory ecology, anthropogenic soundscape, acoustic masking, Anthropocene, urbanisation, habitat degradation, traffic noise

Author contributions (CRediT)

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Data and code accessibility: All materials, data and code associated with this study have been archived on Zenodo (<https://doi.org/10.5281/zenodo.23722170>, Sánchez-Tójar et al., 2026b).

Introduction

Anthropogenic noise is among the most widespread yet underappreciated forms of environmental change of our time. Rapid expansion of transportation networks, urbanisation, industrial activity, and energy infrastructure has dramatically increased acoustic disturbance across terrestrial, freshwater, and marine ecosystems. This is exposing wildlife to both acute and chronic noise levels far beyond historical baselines (Barber et al., 2010; Shannon et al., 2016). Unlike many other pollutants, noise propagates across habitat boundaries, fluctuates dynamically through time, and can permeate otherwise structurally intact ecosystems, altering ecological conditions without visibly transforming landscapes (Francis & Barber, 2013). Increasing evidence suggests that anthropogenic noise should not be viewed merely as a transient disturbance. Rather, it may be considered a form of sensory habitat degradation capable of reshaping ecological interactions, movement behaviour, and species distributions (Ware et al., 2015; Brumm & Horn, 2019; Senzaki et al., 2020).

Despite its global extent and potential ecological and evolutionary consequences, noise pollution is underrepresented in global change research relative to other anthropogenic drivers such as climate change, land-use change, or chemical pollution (Dominoni et al., 2020). Anthropogenic noise can influence fitness through multiple pathways. Chronic noise exposure can induce physiological stress that impairs immune function and accelerates cellular ageing (Dorado-Correa et al., 2018; Brumm et al., 2021). By masking biologically important acoustic cues or by distracting attention, noise can also reduce predator detection and increase predation risk (Chan et al., 2010; Simpson et al., 2016). In addition, because many animals perceive anthropogenic noise as an aversive stimulus, it can alter habitat use and reduce foraging efficiency (Luo et al., 2015). Nevertheless, the ecological significance of these effects and their consequences for organismal fitness remain insufficiently quantified at broad spatial and taxonomic scales. Over evolutionary timescales, persistent fitness consequences of anthropogenic noise are expected to impose sustained selection, potentially driving adaptive divergence, reshaping trait distributions, and altering the evolutionary trajectories of populations, with far-reaching consequences for biodiversity in globally changing environments (Swaddle et al., 2015; Gomes et al., 2021).

Birds are a highly relevant taxon for understanding the biological consequences of anthropogenic noise because they rely heavily on acoustic communication and are among the best-monitored taxa globally (Slabbekoorn & Ripmeester, 2008; Kight & Swaddle, 2011). Avian acoustic signals are crucial to territory defence, mate attraction, predator detection, parent–offspring communication, and social coordination. Consequently, birds are especially vulnerable to acoustic interference from various noise sources (Catchpole & Slater, 2008). Previous studies reported that anthropogenic noise can impair predator detection in birds (Templeton et al., 2016), decrease reproductive performance (Kight et al., 2012), and elevate physiological stress and delay development (Injaian et al., 2018c; Zollinger et al., 2019). All these effects may be amplified at the population level and thus affect population dynamics, alter community composition, and modify ecosystem functioning (Francis et al., 2009, 2012). Conveniently, birds' nesting habits allow reliable and repeatable quantification of fitness metrics, including offspring survival and development as well as parental care and investment. Therefore, studies on birds are particularly well-suited to assess how noise affects fitness and, ultimately, to understand how sensory pollution may restructure ecological systems more broadly.

A rapidly growing body of literature has documented a variety of responses to anthropogenic noise in birds using correlational, experimental, and quasi-experimental approaches. However, the magnitude, generality, and eco-evolutionary significance of these responses are difficult to evaluate because findings vary substantially among species, habitats, life stages, and study designs. Importantly, many observational studies are confounded by co-occurring anthropogenic factors such as habitat degradation, chemical pollution, artificial light at night, urbanisation, or human presence, making it challenging to isolate the causal effects of noise itself (Summers et al., 2011; Swaddle et al., 2015). Recent syntheses have substantially advanced our understanding of anthropogenic noise effects in birds by documenting widespread impacts on communication, behaviour, physiology, habitat use, and reproduction, and by identifying species traits associated with variation in sensitivity (Shannon et al., 2016; Kunc & Schmidt, 2021; Engel et al., 2024; Madden et al., 2026). Collectively, these studies have linked noise pollution to numerous changes in avian phenotypes. However, because existing syntheses have included many other traits with unclear links to fitness, often jointly considered observational and experimental studies, or evaluated responses by their magnitude rather than their (directional) implications for fitness, the extent to which anthropogenic noise affects fitness remains unresolved. Considerable variation in methodological approaches (e.g., playback designs) and the quality of reporting further complicates efforts to identify the conditions under which noise exposure is most biologically consequential.

Here, we present a pre-registered systematic review and meta-analysis of the causal effects of anthropogenic noise on avian fitness, based exclusively on experimental studies. Previous meta-analyses have included fitness-related responses and provided an important foundation for evaluating biological impacts, but the evidence base has been expanded substantially in recent years. The avian subset of 36 studies in Kunc and Schmidt's (2021) synthesis comprised 149 effect sizes from 38 species, published between 2006 and 2018, while the experimental subset of 42 studies on reproduction, growth, and physiology included in Madden et al. (2026) comprised 188 effect sizes from 24 species. Our synthesis compiles 535 fitness-related effect sizes from 53 studies encompassing 45 species and spans research published between 1990 and 2024, including a large body of evidence generated since previous reviews. By restricting analyses only to studies in which noise exposure was experimentally manipulated, and by focusing on direct fitness measurements and on fitness proxies with well-accepted directional predictions, we isolate the effects of acoustic pollution from correlated environmental stressors and provide a robust estimate of its direct biological consequences.

We ask whether anthropogenic noise reduces fitness across bird species. To address this question, we examined variation among direct fitness components (reproductive performance and survival-related measures) and indirect fitness components (parental investment, morphology and growth, and physiological measures), while evaluating the influence of life stage at exposure, exposure duration, and noise level. We also assessed potential methodological bias (ecological realism) and publication biases (small-study effects, decline effect, incomplete reporting). Specifically, we test the following hypotheses:

- H1: Noise negatively affects avian fitness, also increasing the opportunity for selection (Predictions 1–6).
- H2: Noise's negative effects on avian fitness are stronger early in life (Predictions 7–8).
- H3: Noise's negative effects on avian fitness are additive (Predictions 9–12).

- H4: Noise's negative effects on avian fitness differ across different methods (Predictions 13–16).
- H5: The literature on the noise fitness effects of birds suffers from publication biases (Predictions 17–19).

All predictions are detailed in our pre-registration (Sánchez-Tójar et al., 2026a) and the Supporting Information (Appendix S1). By quantifying the causal effects of anthropogenic noise on avian fitness across experimental studies, we provide a critical test of whether sensory pollution constitutes a biologically meaningful driver of global change.

Methods

Registration, reporting and search strategy

This systematic review protocol is consistent with established guidelines for the field (e.g., Foo et al., 2021), and it is reported following the PRISMA Eco-Evo guidelines (O'Dea et al., 2021). We pre-registered our hypotheses, predictions, methodology and analysis prior to data analysis (22/07/2026) at the Open Science Framework (Sánchez-Tójar et al., 2026a: <https://doi.org/10.17605/OSF.IO/HBPSE>). Unless stated otherwise, we adhered to the pre-registered protocol. Throughout, we used R v4.3.1 (R Core Team, 2023).

Manual scoping searches initially conducted via Google Scholar identified 25 studies considered relevant to our review, which were subsequently used to design keyword search strings for Web of Science ('WoS') Core Collection and Scopus (17/01/2025; details in Appendix S2). Our keyword search string included terms designed to capture: (i) relevant species (e.g., "passerine*", "bird*", along with a list of bird genera); (ii) fitness or fitness-proxies of interest (e.g., "body size", "survival", "clutch size", "breeding success"); and (iii) anthropogenic noise pollution (e.g., "anthropogenic noise" OR "traffic noise"). The full keyword search strings are available in Appendix S6. In addition, backwards and forwards searches were conducted for the initial 25 studies using the 'citationchaser' Shiny app (v0.0.3; Haddaway et al., 2022). Records from all searches were deduplicated via the R package 'revtools' (v0.4.1; Westgate, 2019), initially giving 2,826 unique records for the title-and-abstract screening, which we performed using Rayyan (Ouzzani et al., 2016). A second set of backwards and forwards searches was then conducted using a subset of 27 narrative reviews, systematic reviews, or meta-analyses identified from the initial set of records (27/02/2025), which was again deduplicated against the original searches to bring the total number of records that went through title-and-abstract screening to 5,679.

Two independent screeners (LdF, AC) conducted the title-and-abstract screening based on our inclusion criteria (details below). Three training sets of 100 studies were initially and iteratively screened by both observers independently to ensure that criteria were being applied consistently. Only when the disagreement rate was below 5% did the two screeners begin the screening of the remaining records; 71% of all records were screened by both screeners. All conflicting decisions ($n = 43$) were resolved collaboratively. In all, 119 records were included for full-text screening, with 50% of records being screened by both observers (LdF, AC). Conflicting decisions ($n = 9$) were resolved by both observers collaboratively.

Study selection

Studies were first screened at the title-and-abstract stage and retained if (1) they were written in English, German, Spanish, Korean or Italian; (2) they reported primary empirical data

(excluding reviews, meta-analyses and purely theoretical work); (3) the study species was a bird that was not a farm animal in a production setting; (4) they assessed the effect of noise specifically, rather than a general urban-rural contrast or artificial light at night; (5) they measured fitness or a fitness proxy; and (6) they included either a control group or a noise gradient. At the full-text stage, papers additionally had to meet the following criteria: (7) the full text was available after a thorough search, including contacting authors; (8) the paper was written in English, German, Spanish, Korean or Italian; (9) noise was quantified and measured in dB or dB(A); and (10) noise levels were manipulated experimentally. In cases where data published in a study or thesis were also fully included within another published format (e.g., where thesis results were also published in a journal article, or vice versa; $n = 11$), both studies were considered to meet the inclusion criteria. However, only one was included in the final quantitative dataset (i.e., generally the more comprehensively reported record, or the one for which data could be more readily extracted). In total, 69 studies were identified that met the inclusion criteria, of which 58 unique records were included in data extraction, with only 53 studies reporting enough information to make it to the meta-analysis. Screening records, extraction databases, and PRISMA records are archived (Sánchez-Tójar et al., 2026b). Further literature search, processing and screening details are available in Appendix S2 and S6.

Data extraction and preparation

Initial extractions were conducted by LdF, AC and NPM, and extractions were reviewed by one other author to ensure consistency. For each study, we extracted several variables, many of which correspond to our moderators (full list in Appendix S3). For calculating effect sizes, summary data for fitness proxy variables (control and experiment group means, sample sizes, standard deviations) were extracted from studies if reported, or calculated using the studies' public raw dataset if available ($k = 284$ effect sizes, $n = 18$ studies) using the R package 'dplyr' v1.1.4 (Wickham et al., 2026). The extraction directly from available raw data prioritised direct measures of fitness and fitness proxies used in the study itself. Three studies ($k = 23$) using experimental gradient designs were included. Reported correlation coefficients were extracted directly from these studies or, whenever necessary, Pearson's r correlation coefficients were calculated where public raw datasets were available. Data from study figures were extracted when summary or raw data were not provided using the R package 'metaDigitise' (v1.0.2; Pick et al., 2019). We did not calculate any effect sizes from inferential statistics. We contacted corresponding authors for 29 studies that had missing or incomplete data reporting using a standard email template (Appendix S5). In case of no response after 2 weeks, we sent a reminder. If no response was provided after an additional 3 weeks, we sent a second reminder, after which any variable with insufficient data available to calculate an effect size was excluded from the analyses. Author correspondence allowed us to recover data for a total of 16 studies.

Effect size calculation

Our dataset contained three different types of experimental designs: (i) independent control-treatment comparisons ($k = 470$, $n = 43$), (ii) dependent pre- and post-exposure comparisons ($k = 42$, $n = 10$), and (iii) experimental gradients ($k = 23$, $n = 3$). Using the means, standard deviations and sample sizes for each independent control-treatment comparison and dependent pre- and post-exposure comparisons (assuming an $r = 0.5$), we calculated our main effect size of interest and its associated sampling variance for the meta-analysis of means, i.e., the standardised mean difference with heteroskedasticity correction (SMDH), and our supplementary effect size (Appendix S4), i.e., the log response ratio (lnRR); both using the function 'escalc' from the R package 'metafor' v4.6-0 (Viechtbauer, 2010). For the meta-

analysis of variance (Nakagawa et al., 2015), we used the means, standard deviations and sample sizes for each independent control–treatment comparison to calculate our main effect size of interest and its associated sampling variance, i.e., the log coefficient of variation ratio (lnCVR), and our supplementary effect size (Appendix S4), i.e., the log variation ratio (lnVR); both using the function ‘escalc’ from the R package ‘metafor’ v4.6-0 (Viechtbauer, 2010). To calculate lnCVR and lnVR for dependent pre- and post-exposure comparisons, we used the equations developed by Senior et al. (2020). Finally, the 23 effect sizes from the experimental gradients were transformed into SMD following Mathur and VanderWeele (2020).

In cases where the same control or treatment group was used in multiple comparisons (e.g., experiments with more than 2 groups), sample sizes were adjusted before calculating effect sizes by dividing them by the number of times each group was used in a comparison to account for shared group nonindependence. Shared group nonindependence was also accounted for via random effects (see below). Finally, whenever necessary, the sign of the effect sizes was inverted after effect size calculation to ensure that a negative value consistently meant a decrease in fitness across all fitness proxies (i.e., to ensure comparability across effect sizes). Thus, negative values indicate either a negative effect of anthropogenic noise on fitness (SMD.H, lnRR) or a decrease in variance in fitness (lnCVR, lnVR).

Data analysis

All phylogenetic multilevel meta-analytical models and meta-regressions were fitted using the function ‘rma.mv’ from the R package ‘metafor’ v4.6-0 (Viechtbauer, 2010; method = “REML”, test = “t”). Sampling variances were modelled as variance–covariance matrices assuming a correlation of 0.5 between sampling variances from the same study (Noble et al., 2017) using the function ‘vcalc’ from the R package ‘metafor’ v4.6-0 (Viechtbauer, 2010).

All our models included the random effects we had outlined in our pre-registration: (a) effect size ID, which is a unit-level effect and represents residual/within-study variance; (b) shared group ID, which encompasses effect sizes for which one of the comparison groups is shared; (c) repeated trait ID, which encompasses effect sizes on the same trait taken for the same exact group of individuals in a temporal fashion (e.g., body mass measured several days from hatching to fledging); (d) study ID, which encompasses effect sizes extracted from the same study; (e) laboratory ID, which contains effect sizes obtained from the same research group; (d) species name, which encompasses effect sizes derived from the same specie; and (e) phylogeny, which consists of the phylogenetic correlation matrix and informs about the relatedness between species. Decomposing species-level variation into two components facilitates obtaining unbiased estimates (Cinar et al., 2022). For generating the phylogenetic correlation matrix among species, we used v1.5 of the new global tree of birds (McTavish et al., 2025), output in the 2024 taxonomy, which we obtained using the functions ‘taxonomyGet’ and ‘extractTree’ from the R package ‘clouti’ v0.1.2 (Miller et al., 2025). Branch lengths are in millions of years (Figure S2; more in McTavish et al., 2025). Non-pre-registered sensitivity analyses using different random effects structures confirmed the robustness of our overall effect (Table S4).

Our analytical procedure consisted of, first, fitting the corresponding multilevel intercept-only meta-analytical models to test the overall effect of anthropogenic noise on fitness, its uncertainty and heterogeneity (Hypothesis 1, Predictions 1 and 2). Then, we ran a series of meta-regressions to test all remaining hypotheses and predictions (Hypotheses 1–5, Predictions 3–19) strictly following our pre-registration (see also Appendix S1). For hypothesis

4, specifically, we focused on testing a series of potential methodological differences across studies, some of which could be considered an exploration of risk of bias (*sensu* Culina et al., 2026). Hypothesis 5 concerned publication bias, specifically, two types that are commonplace in ecology and evolutionary biology: small-study (i.e., smaller sample size studies reporting larger overall effect sizes than larger sample size studies) and decline effects (i.e., effect sizes decreasing over time; Yang et al., 2023). Following Nakagawa et al. (2022), to test for small-study effects, we ran a multilevel meta-regression using the ‘square-root of the inverse of the effective sample size’ as the moderator; and to test for decline effects, we ran a multilevel meta-regression using ‘year of publication’ (mean-centred) as the moderator. In addition, previous meta-analyses have shown that studies not reporting or reporting results partially tend to provide larger effects than studies reporting their results in full (Kim et al., 2021; Moran et al., 2021), which we also tested.

Last, we performed three additional non-pre-registered sensitivity analyses to explore potential methodological factors. First, following recommendations in Sánchez-Tójar & D’Amelio (2026), we tested whether effect sizes differed depending on effect size origin, that is, between study designs comparing independent, dependent or gradient designs. Second, we tested the robustness of our results to the existence of effect sizes that failed Geary’s test. Third, we tested whether effect sizes obtained from PhD theses ($n = 7$) differed from effect sizes obtained from published articles.

For all intercept-only models, we estimated the total amount of absolute heterogeneity (σ^2 ; i.e., the total variation not explained by sampling error), its sources or relative heterogeneity (I^2), a mean-standardised (CVH2) and variance-mean-standardised metric of heterogeneity (M2) following the pluralistic approach suggested by Yang et al. (2025). For all meta-regressions, we estimated R^2_{marginal} , which corresponds to the percentage of heterogeneity explained by the moderators (Nakagawa & Schielzeth, 2012). All heterogeneity metrics, R^2_{marginal} and plots were obtained using the R package ‘orchaRd’ v2.0 (Nakagawa et al., 2023). Throughout, 95% CI and 95% PI refer to 95% confidence intervals and 95% prediction intervals, respectively.

Results

We obtained 535 eligible effect sizes from 53 studies published between 1990 and 2024 (median = 2019), with 59% of the studies published since 2015. From the 53 studies, 7 corresponded to PhD theses, whereas the remaining 46 were published across a total of 34 scientific journals. Most studies were performed in North America ($n = 34$), followed by Europe ($n = 15$), Oceania ($n = 2$) and South America ($n = 2$; Figure 1). The studies were conducted on 45 species by 30 research groups (median = 1 study per research group, max = 7). Most species (67%) were studied in a single study, with two species being particularly common in our dataset: *Tachycineta bicolor* (10 studies, 63 effect sizes) and *Taeniopygia guttata* (8 studies, 150 effect sizes). The seven most commonly studied species represented 75% of all effect sizes and 73% of all studies. The mean ($\pm$ standard deviation) number of effect sizes calculated per study was 10.1 ± 11.0 (median: 6, range: 1–56) and the mean adjusted sample size (i.e., after accounting for shared group nonindependence sample size adjustments) was 48 ± 53 (median: 29, range: 6–609 nests/individuals; only 67 data points (12.9%) had a total sample size of 95 or more).

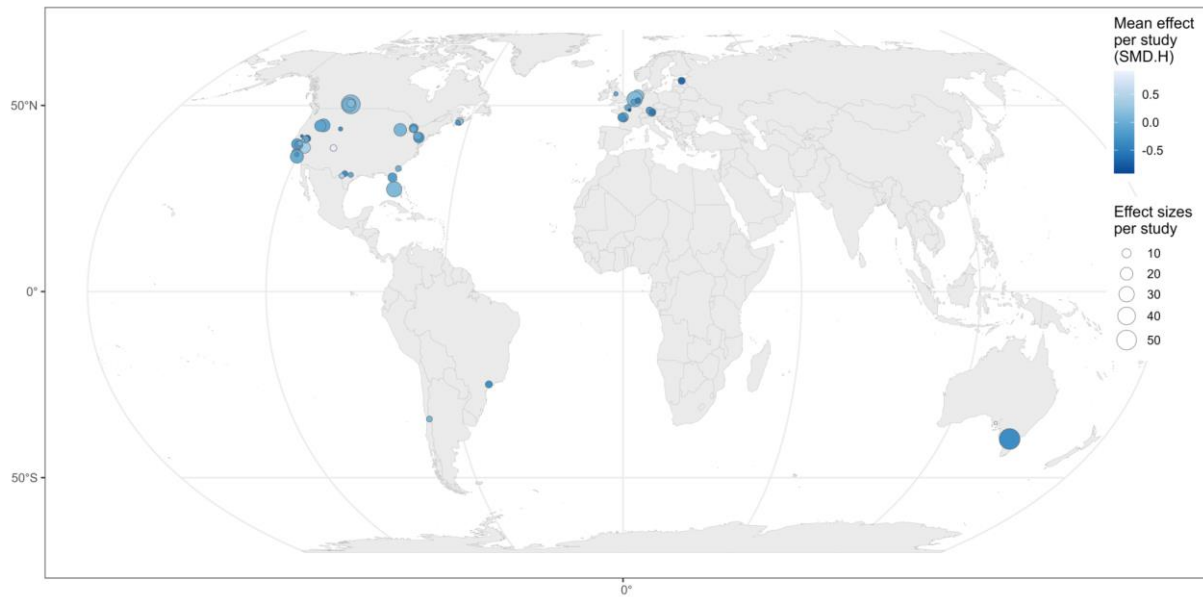


Figure 1. Geographical distribution of the 53 studies included in the meta-analysis testing the fitness effects of anthropogenic noise in birds (Holthuijzen et al., 1990; Tempel & Gutierrez, 2003; Leonard & Horn, 2008; Francis, 2010; Hayward et al., 2011; Delaney et al., 2011; Lackey, 2011; Blickley et al., 2012; Grenna, 2013; Crino et al., 2013; Naguib et al., 2013; Meillère et al., 2015a,b; Ware et al., 2015; Leonard et al., 2015; Potvin & MacDougall-Shackleton, 2015; Lucass et al., 2016; Angelier et al., 2016; Halfwerk et al., 2016; Potvin et al., 2016; Wolfenden, 2017; Long et al., 2017; Brischoux et al., 2017; Davies et al., 2017; Huet Des Aunay et al., 2017; Injaian et al., 2018a,b,c; Mulholland et al., 2018; Dorado-Correa et al., 2018; Heathcote, 2019; Flores et al., 2019; Zollinger et al., 2019; Injaian et al., 2019; Walthers & Barber, 2020; Ferraro et al., 2020; Williams et al., 2021; Brumm et al., 2021; Pandit et al., 2021; Obomsawin et al., 2021; Carey, 2021; Bird, 2022; Rosa & Koper, 2022; Liu et al., 2022; MacLeod et al., 2022; Dharmasiri et al., 2022; Viigipuu et al., 2023; Iasiello & Colombelli-Négrel, 2023; Daria et al., 2023; Sieving et al., 2024; Barbosa-Moyano et al., 2024; Meillère et al., 2024; Ozkan et al., 2024). Point size reflects the number of effect sizes calculated from each location (range: 1–56), and colour denotes the estimated SMD.H (see legend). The map was performed using the R packages ‘sf’ v1.0-16 (Pebesma et al., 2026) and ‘rnaturalearth’ v1.2.0 (Massicotte et al., 2026), with country boundaries from Natural Earth (1:50m) and study locations projected onto an equal-area Equal Earth projection (EPSG:8857).

Main effect models (P1–P2)

The intercept-only meta-analysis of means showed an average negative effect of anthropogenic noise on fitness (Hypothesis 1, P.1). Birds under an experimental increase in anthropogenic noise showed an average statistically significant decrease in fitness estimates (Figure 2A; SMD.H = -0.114 , 95% CI: $[-0.181, -0.047]$, 95% PI: $[-0.681, 0.453]$, p -value < 0.001 , $k = 535$ effect sizes, $n = 53$ studies). Heterogeneity among effect sizes was low to moderate. Total raw heterogeneity (σ^2) was 0.082 ($Q = 1422.8$, p -value < 0.001), and both relative ($I^2_{\text{total}} = 52.4\%$) and standardised heterogeneity metrics ($CVH2_{\text{total}} = 6.31$; $M2_{\text{total}} = 0.86$) lay between the 10th and 65th percentile of empirically derived estimates (Yang et al., 2025). Results were robust to using the lnRR as effect size; however, the effect size was smaller, statistically non-significant, and more heterogeneous (Appendix S4). In addition, the meta-analytic mean was robust to 12 non-pre-registered sensitivity analyses run with different data subsets and/or random effect structure (Table S4).

The intercept-only meta-analysis of variance showed an average small and statistically non-significant increase in variance in fitness among birds under anthropogenic noise (Hypothesis 1, P.2; Figure 2B; lnCVR = 0.022 , 95% CI: $[-0.046, 0.089]$, 95% PI: $[-0.533, 0.576]$, p -value = 0.532 , $k = 501$ effect sizes, $n = 51$ studies). Heterogeneity among effect sizes was low to high. Total raw heterogeneity (σ^2) was 0.079 ($Q = 1518.5$, p -value < 0.001), and although I^2

suggested relatively low levels of heterogeneity ($I^2_{\text{total}} = 58.5\%$), the other standardised heterogeneity metrics suggested high levels ($CVH2_{\text{total}} = 169.0$; $M2_{\text{total}} = 0.99$; Yang et al., 2025). Results were robust to using $\ln VR$ as the effect size (Appendix S4).

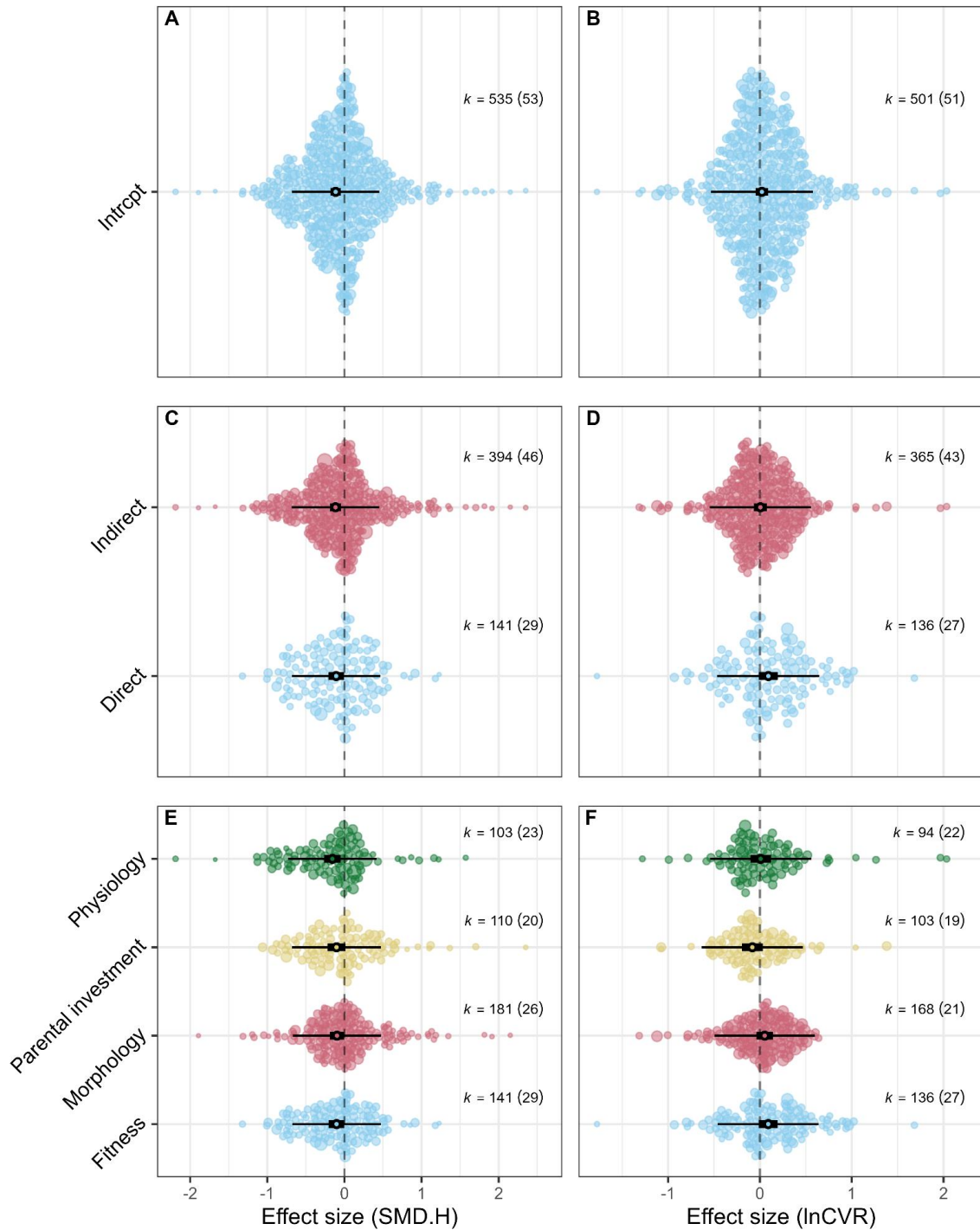


Figure 2. Overall and fitness-category effects of anthropogenic noise on mean fitness (A, C, E) and variance in fitness (B, D, E). The meta-analytic means (black-border circle), 95% confidence intervals (thicker bars) and 95% prediction intervals (thinner bars) are shown along with the data points (coloured circles) scaled by precision (inverse of standard error, $1/SE$). k: number of effect sizes (number of studies is shown in brackets).

Fitness type effects (P3–P6)

At the mean level, we did not find clear evidence for the effect of noise being larger when fitness was measured directly. Our meta-regressions using SMD.H as effect size showed that both direct and indirect effects were negative (Hypothesis 1, P.3; Table 1a; Figure 2C), did not differ statistically from each other (p -value = 0.852), and the moderator explained virtually no heterogeneity ($R^2_{\text{marginal}} = 0.0\%$). In addition, we did not observe a decreasing effect of noise from direct fitness proxies to parental investment, morphology and growth, and physiology (Hypothesis 1, P.5; Table 1a; Figure 2E), and none of the four categories differed statistically significantly from each other (p -value > 0.351; $R^2_{\text{marginal}} = 0.6\%$). Results were generally robust when using lnRR as effect size (Table S1a).

At the variance level, the variance tended to be larger when fitness was measured directly compared to when it was measured indirectly (lnCVR: Hypothesis 1, P.4; Table 1b; Figure 2D), although statistically significant so (p -value = 0.074; $R^2_{\text{marginal}} = 1.9\%$). In addition, we did not observe a decreasing variance effect of noise from direct fitness proxies to parental investment, morphology and growth, and physiology (Hypothesis 1, P.6; Table 1b; Figure 2F), but the category of parental investment showed a reduction in variance that was statistically significantly different from the categories direct fitness (p -value = 0.008) and morphology and growth (p -value = 0.039; all other comparisons p -value > 0.222). This moderator also explained a non-negligible amount of heterogeneity ($R^2_{\text{marginal}} = 4.8\%$). Results were generally robust when using the lnVR as effect size (Table S2a).

Table 1a. Meta-regression models containing categorical moderators fitted without an intercept, giving the estimate of SMD.H for each level.

Model	Term	Estimate	P-value	95% CI	k	n
Fitness proxy level (H1, P3)	direct	-0.107	0.039	-0.208, -0.006	141	29
	indirect	-0.116	0.001	-0.186, -0.046	394	46
Fitness proxy category (H1, P5)	fitness	-0.102	0.049	-0.204, -0.000	141	29
	morphology	-0.096	0.040	-0.188, -0.004	181	26
	parental investment	-0.103	0.081	-0.218, 0.013	110	20
	physiology	-0.156	0.005	-0.264, -0.048	103	23
Bird stage (H2, P7)	post-fledging	-0.075	0.051	-0.151, 0.000	361	47
	pre-fledging	-0.178	<0.001	-0.265, -0.090	174	27
Noise treatment extent (H3, P9)	post-hatching	-0.102	0.086	-0.219, 0.015	158	18
	pre-hatching	-0.147	0.058	-0.299, 0.005	57	7
	unclear	-0.368	0.003	-0.608, -0.129	15	5
	whole-breeding	-0.090	0.048	-0.180, -0.001	278	26

Note. Values in bold indicate $p < 0.05$ or a 95% confidence interval (CI) not overlapping zero. k = number of effect sizes; n = number of studies.

Table 1b. Meta-regression models containing categorical moderators fitted without an intercept, giving the estimate of lnCVR for each level.

Model	Term	Estimate	P-value	95% CI	k	n
Fitness proxy level (H1, P4)	direct	0.092	0.081	-0.011, 0.194	136	27
	indirect	0.005	0.882	-0.065, 0.076	365	43
Fitness proxy category (H1, P6)	fitness	0.090	0.086	-0.013, 0.194	136	27
	morphology	0.052	0.251	-0.037, 0.141	168	21
	parental investment	-0.083	0.155	-0.196, 0.031	103	19
	physiology	0.008	0.886	-0.104, 0.120	94	22

Note. Values in bold indicate $p < 0.05$ or a 95% confidence interval (CI) not overlapping zero. k = number of effect sizes; n = number of studies.

Table 1c. Meta-regression models containing continuous moderators for SMD.H.

Model	Term	Estimate	P-value	95% CI	k	n
Time after hatching (H2, P8)	intercept	-0.127	0.007	-0.219, -0.035	294	36
	bird age	-0.000	0.770	-0.002, 0.002	NA	NA
Time and intensity of exposure (H3, P10-P11)	intercept	-0.070	0.854	-0.819, 0.679	300	32
	sampling time after noise	-0.005	0.567	-0.021, 0.011	NA	NA
	experimental noise level	-0.000	0.966	-0.011, 0.011	NA	NA
	sampling time after noise * experimental noise level	0.000	0.575	-0.000, 0.000	NA	NA
Noise treatment (H3, P12)	intercept	-0.130	0.078	-0.274, 0.014	294	25
	difference control- experimental noise	0.003	0.400	-0.004, 0.010	NA	NA

Note. Values in bold indicate $p < 0.05$ or a 95% confidence interval (CI) not overlapping zero. k = number of effect sizes; n = number of studies; NA = not applicable.

Early-life effects (P7–P8)

As predicted, the negative effect of anthropogenic noise on fitness was stronger early in life, with effects being more negative pre- vs. post-fledging (SMD.H: p -value = 0.028; Hypothesis 2, P.7; Table 1a; Figure 3A); although the moderator explained little heterogeneity ($R^2_{\text{marginal}} = 0.6\%$). When focusing on the subset of effect sizes for which bird age (days) was available, which was substantially smaller, there was no evidence for the negative effect of noise on fitness becoming smaller as time progresses from hatching (Hypothesis 2, P.8; Table 1c; $R^2_{\text{marginal}} = 0.1\%$). Results were generally robust when using the lnRR as effect size, although the pre- vs post-fledging difference was not statistically significant (Table S1a,b).

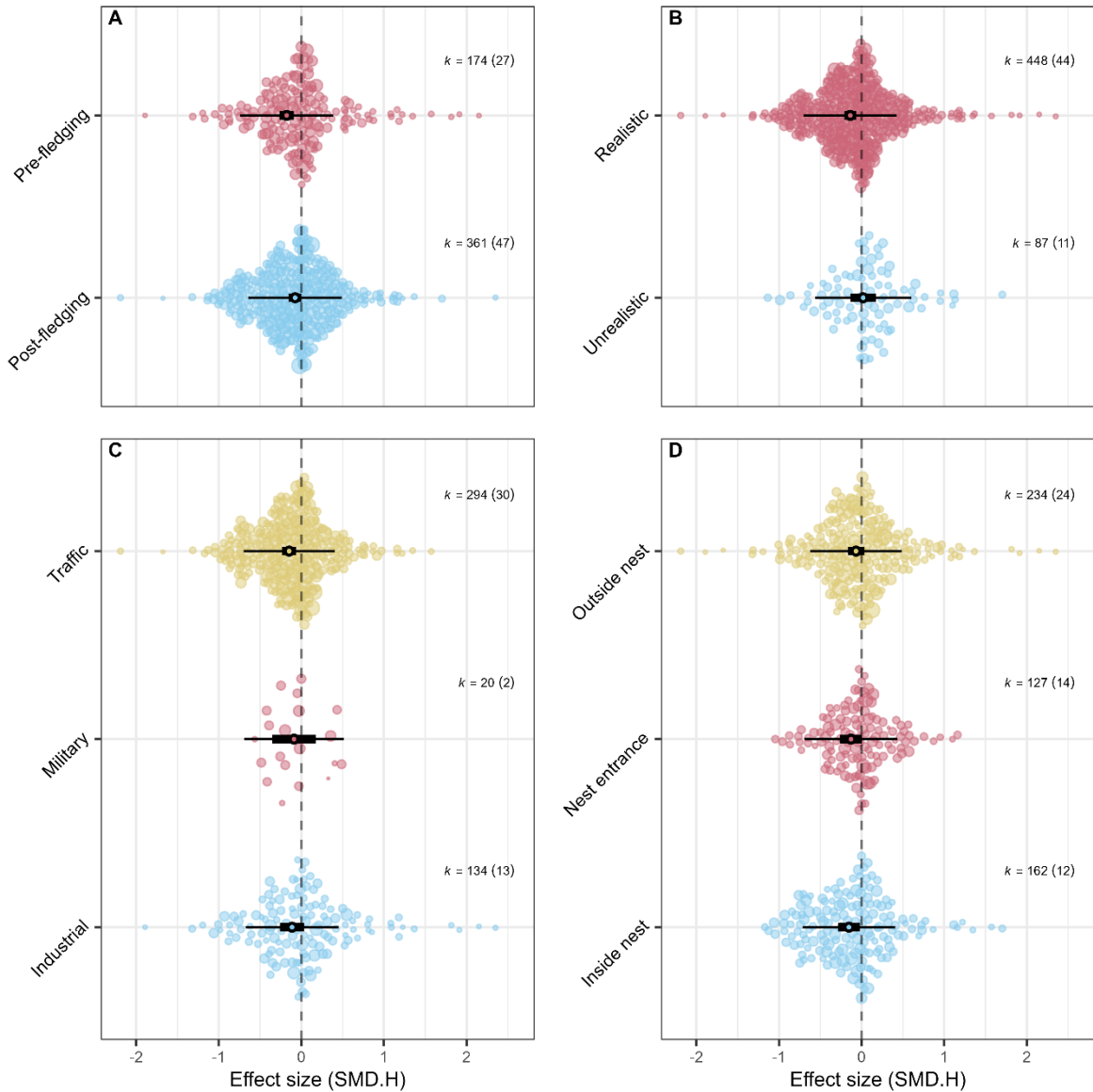


Figure 3. Early-life (A: P.7) and methodological (B: P.13; C: P.14; D: P.16) effects of anthropogenic noise on mean fitness. The meta-analytic means (black-border circle), 95% confidence intervals (thicker bars) and 95% prediction intervals (thinner bars) are shown along with the data points (coloured circles) scaled by precision (inverse of standard error, $1/SE$). k: number of effect sizes (number of studies is shown in brackets).

Additive effects (P9–P12)

We found no clear evidence that the negative effects of anthropogenic noise were stronger when noise was broadcasted for longer or when it was louder, whether in absolute terms or relative to ambient levels (SMD.H: Hypothesis 3, P.9-P12; Table 1a,c). The meta-regression testing the negative effect of noise on fitness is larger when noise exposure takes place over the whole breeding period, followed by treatments taking place post-hatching, and then pre-hatching showed an unexpected stronger negative effect for effect sizes categorised as unclear ($R^2_{\text{marginal}} = 2.7\%$); however, caution should be taken when interpreting this result given the small sample size of this level ($k = 15$ effect sizes, $n = 5$ studies). Results were generally robust when using the lnRR as effect size (Table S1a,b).

Methodological effects (P13–P16)

Our meta-regressions suggested differences in effect size across methods. First, experimental designs using ecologically realistic noise sources such as traffic or industrial, tended to cause larger negative effects of noise on fitness than unrealistic noise sources such as synthetic noise (SMD.H: Hypothesis 4, P.13; Table 2, Figure 3B). Although that difference was not statistically significant (p -value = 0.065), this moderator explained a non-negligible amount of heterogeneity ($R^2_{\text{marginal}} = 3.9\%$). Second, further exploring only studies using realistic noise sources for differences between types of noise sources (no directional prediction) did not show strong evidence for differences (SMD.H: Hypothesis 4, P.14; p -value > 0.678 for all comparisons; Table 2, Figure 3C; $R^2_{\text{marginal}} = 0.5\%$).

Third, we explored whether noise effects differed between studies conducted in the wild versus in the laboratory, and for those in the lab, whether the negative effects of noise were stronger in captive-bred vs wild-caught populations, but found no clear evidence for any differences (SMD.H: Hypothesis 4, P.15; p -value > 0.575 for all comparisons; Table 2; $R^2_{\text{marginal}} = 0.4\%$). Finally, as predicted, studies measuring sound pressure levels inside versus at the entrance and outside the nest tended to find stronger negative effects of noise (Figure 3D), likely due to measurements inside the nest being more biologically relevant; however, none of the pair comparisons was statistically significant (SMD.H: Hypothesis 4, P.16; p -value > 0.310 for all comparisons; Table 2; $R^2_{\text{marginal}} = 1.9\%$). This result was robust to a non-pre-registered sensitivity analysis excluding non-breeding-based estimates ($k = 29$) from the outside nest group, leading to a slightly more pronounced gradient (Table S5; $R^2_{\text{marginal}} = 2.5\%$).

Table 2. Meta-regression models containing categorical moderators fitted without an intercept, giving the estimate for each level.

Model	Term	Estimate	P-value	95% CI	k	n
Noise biological relevance	realistic	0.019	0.810	−0.137, 0.175	87	11
	unrealistic	−0.135	<0.001	−0.207, −0.064	448	44
Noise type	industrial	−0.113	0.129	−0.259, 0.033	134	13
	military	−0.089	0.512	−0.355, 0.177	20	2
	traffic	−0.145	0.001	−0.230, −0.061	294	30
Study location	lab (long-term)	−0.152	0.047	−0.301, −0.002	104	10
	lab (short-term)	−0.138	0.635	−0.708, 0.432	6	1
	wild	−0.102	0.008	−0.178, −0.027	425	42
Noise measuring position	inside nest	−0.153	0.025	−0.287, −0.019	162	12
	nest entrance	−0.123	0.069	−0.255, 0.010	127	14
	outside nest	−0.067	0.181	−0.166, 0.032	234	24

Note. Values in bold indicate $p < 0.05$ or a 95% confidence interval (CI) not overlapping zero. k = number of effect sizes; n = number of studies.

Publication bias (P17–P19)

We found no conclusive evidence for the existence of publication biases in the published literature. First, there was no statistical evidence for asymmetry in the funnel plot, and thus, no statistical evidence for small-study effects (Slope = -0.057 , 95% CI: $[-0.467, 0.353]$, p -value = 0.785 , $k = 535$, $n = 53$; $R^2_{\text{marginal}} = 0.1\%$; Hypothesis 5, P.17; Table S3). Second, since effect sizes did not change over time (Slope = -0.000 , 95% CI: $[-0.011, 0.010]$, p -value = 0.978 , $k = 535$, $n = 53$, $R^2_{\text{marginal}} = 0.0\%$; Table S3), our analyses suggest no clear evidence of decline effects (Hypothesis 5, P.18; Table S3). Last, effect sizes from studies reporting data incompletely were not statistically different to those from studies (presumably) reporting data in full (Hypothesis 5, P.19; p -value = 0.856 ; $R^2_{\text{marginal}} = 0.0\%$; Table S3).

Additional non-pre-registered sensitivity analyses

We did not find statistical evidence that effect sizes differed depending on effect size origin, (i) independent control-treatment comparisons ($k = 470$, $n = 43$), (ii) dependent pre- and post-exposure comparisons ($k = 42$, $n = 10$), and (iii) experimental gradients ($k = 23$, $n = 3$; p -value > 0.144 for all comparisons; Table S6, $R^2_{\text{marginal}} = 2.3\%$). Second, although effect sizes that failed the Geary's test ($k = 58$) were statistically significantly more negative than those that passed it (p -value = 0.041 ; Table S6, $R^2_{\text{marginal}} = 2.2\%$), the overall effect remained statistically significantly negative (SMD(H) = -0.123 , 95% CI: $[-0.194, -0.052]$, 95% PI: $[-0.678, 0.432]$, p -value < 0.001 , $k = 454$ effect sizes, $n = 47$ studies). Last, effect sizes obtained from PhD theses ($k = 67$) did not differ statistically from effect sizes obtained from published articles ($k = 468$; p -value = 0.983 ; Table S6, $R^2_{\text{marginal}} = 0.0\%$).

Discussion

Our pre-registered meta-analysis indicated that anthropogenic noise reduces avian fitness. Across 535 effect sizes from 53 studies and 45 species, experimental exposure to anthropogenic noise resulted in a small but statistically robust reduction in fitness-related measures. This overall effect was supported by multiple sensitivity analyses and was not readily explained by publication bias. In addition, heterogeneity in effect sizes was small to moderate, implying generalisability. Importantly, our synthesis focused exclusively on experimentally manipulated noise exposure, thereby providing stronger causal evidence than would be possible from the broader observational literature. These findings support the view that anthropogenic noise is not merely a transient disturbance but can impose biologically meaningful fitness costs on birds, strengthening the case for considering noise pollution as an important component of global environmental change.

Noise affects multiple dimensions of avian fitness

The negative effect of noise was remarkably consistent across different measures of fitness. We found no evidence that effects were stronger for direct fitness measures than for indirect fitness proxies, nor did effect sizes differ consistently between direct fitness, parental investment, morphology and growth, and physiological measures. This finding extends the results of Madden et al. (2026), who documented statistically significant effects for communication, risk-taking, aggression, foraging and physiology at the magnitude level (i.e., non-directional), but, contrary to ours, not for reproduction or growth. In addition, our pre-registered meta-analysis extends their synthesis by explicitly comparing direct and indirect measures of fitness and by establishing a causal link between exposure and variation in fitness. The broadly similar effects across categories in our analysis suggest that the

consequences of noise are unlikely to be restricted to a single physiological or behavioural pathway. Instead, anthropogenic noise may affect several components of organismal performance that ultimately converge on fitness.

As confirmed by our synthesis, noise exposure can disrupt parental behaviour (Ozkan et al., 2024; Sieving et al., 2024), induce physiological stress and impair development (Injaian et al., 2018c; Zollinger et al., 2019). These pathways may operate simultaneously and interactively, such that effects that are modest when considered in isolation can accumulate over an individual's life. The absence of statistically detectable differences between fitness categories should therefore not be interpreted as evidence that these mechanisms are equivalent. Rather, it suggests that different pathways may produce similarly negative consequences for organismal performance.

In this context, the relatively small average mean effect size is worth considering. An average standardised mean difference of -0.114 does not imply that noise has negligible biological importance. Anthropogenic noise is widespread, and individuals may experience repeated or chronic exposure over extended periods. Therefore, small reductions in individual performance may become ecologically important when they are persistent, affect many individuals or occur repeatedly across populations. This is particularly relevant given the growing awareness of anthropogenic noise as a widespread environmental stressor rather than an isolated local disturbance (Shannon et al., 2016).

Early life is a sensitive window to noise exposure

We found evidence of stronger noise effects when birds were exposed before fledging than after fledging. The estimated effect for pre-fledging birds was more than twice as large as that for post-fledging birds, suggesting that exposure during early development may carry particularly strong fitness consequences. Young birds may be particularly vulnerable because they are dependent on parental care and undergo substantial physiological, morphological, and behavioural development. Noise during this period could therefore interfere with several processes simultaneously, including parent–offspring communication, resource provisioning, growth, and physiological regulation. Such developmental effects could be especially important if early-life exposure produces persistent changes that extend beyond the period of exposure, such as increased cellular ageing (Dorado-Correa et al., 2018) and cognitive impairments (Brumm et al., 2021).

While our results identify the nestling stage as a potentially critical period, they do not establish a monotonic relationship between age and noise vulnerability. This is evident from the absence of a significant relationship between age and effect size – although age was only available for about half of the dataset. Future experiments that manipulate exposure timing across developmental stages are needed to determine the exact period that has disproportionate and potentially persistent consequences for fitness (i.e., sensitive windows). Importantly, studies must consider the auditory capacities and the ontogeny of hearing of the species studied (e.g., Anttonen et al., 2025).

Noise effects are not simply determined by noise dosage

We found little evidence that the magnitude of fitness effects was explained by exposure duration or by the mean or difference in noise levels. The absence of clear dose–response relationships may appear surprising, especially since the harmful effects of noise on human health appear to be dose-dependent (Basner et al., 2014). Perhaps, our findings reflect a

ceiling effect in such that the experimental noise of the synthesised studies already triggered maximum responses at low levels. At the same time, our results may highlight another important characteristic of anthropogenic noise: its biological effects may depend not only on how much noise animals experience, but also on other acoustic characteristics and the ecological context. This interpretation is consistent with previous syntheses showing substantial heterogeneity in responses to anthropogenic noise and with the growing recognition that species traits and ecological context can mediate sensitivity (Kunc & Schmidt, 2021; Madden et al., 2026).

Unlike many chemical pollutants, for which concentration can provide a relatively direct measure of exposure, the biological significance of a sound depends on its frequency spectrum, sound pressure level, temporal structure, predictability, and relationship to the animal's sensory environment. Consequently, two noise treatments with similar sound pressure levels may differ substantially in their biological consequences. Noise that, for instance, overlaps with the hearing range of the targeted species, masks biologically important signals, or is unpredictable (and thereby increasing the physiological burden (de de Boer et al., 1989)), may have stronger effects than noise with different spectral and temporal properties. Moreover, noise that occurs during sensitive windows may impose greater costs than similar noise experienced at more resilient life stages. The lack of a simple relationship between noise level and fitness effects in our dataset therefore suggests that future research should move beyond sound pressure levels as the primary descriptor of exposure and increasingly characterise noise in relation to the sensory and ecological context in which it occurs.

Ecological realism shapes the consequences of noise

Our analyses provide evidence that the ecological realism of noise treatments can influence the magnitude of fitness effects. In other words, the methodological choices that researchers made in experimental design accounted for heterogeneity in findings across studies (see also Smith et al., 2010; Dimri et al., 2026). Studies using ecologically realistic noise types (e.g., traffic noise) showed a statistically significant negative effect on fitness, whereas those using ecologically unrealistic noise types (e.g., synthetic white or pink noise) showed no detectable effect. This contrast suggests that the fitness consequences of noise exposure depend partly on how closely experimental treatments reproduce the acoustic conditions that birds encounter in naturally noise-polluted environments (i.e., on ecological realism). Importantly, this result does not imply that birds respond only to sounds with particular ecological realism; rather, it indicates that realistic representations of anthropogenic noise likely provide a more informative representation of its effects than artificial stimuli.

This finding is particularly relevant when interpreting the broader literature on anthropogenic noise. Experimental studies, whether in the laboratory or the wild, necessarily simplify the acoustic environments in which animals live, and differences in playback design can influence the magnitude and ecological interpretation of observed responses. Previous studies have highlighted substantial variation in noise exposure protocols and in species' responses to anthropogenic sound (Shannon et al., 2016; Kunc & Schmidt, 2021; Engel et al., 2024; Madden et al., 2026). Our results suggest that, beyond whether they take place in the laboratory or in the wild, experiments exposing birds to sounds of little ecological relevance may either underestimate or misrepresent the consequences of noise pollution, whereas ecologically realistic playbacks may better capture the cumulative effects of exposure under ecologically relevant conditions. Importantly, even when noise treatments are ecologically realistic,

exposure may be mischaracterised if it is not quantified at the location actually occupied by the focal individuals, as suggested by our finding that the position at which noise exposure was measured (inside or outside the nest) seemingly explained variation in the observed fitness effects.

Ecological realism is therefore not simply a matter of reproducing average sound levels. Realistic experiments should ideally capture relevant features of natural exposure, including the frequency spectrum, temporal variation, intermittency, and predictability of anthropogenic noise. At the same time, highly realistic experimental treatments can make it more difficult to isolate the mechanisms responsible for observed effects. A useful experimental framework therefore requires a balance between causal control and ecological realism: controlled experiments in the laboratory can identify mechanisms and establish causality, whereas field experiments can test whether these mechanisms operate under realistic environmental conditions. Our finding that ecologically realistic noise types produced stronger effects underscores the importance of this distinction and suggests that future experimental work should increasingly incorporate the acoustic characteristics of real-world soundscapes.

Noise variance effects on direct fitness

In contrast to the clear reduction in mean fitness-related measures, the statistical evidence that anthropogenic noise consistently increased variance in fitness proxies was not conclusive. Although the estimated overall increase in variance in fitness-related measures was small and statistically non-significant, heterogeneity for this meta-analysis was substantial, highlighting context-dependency. Indeed, our analysis testing whether the variance effect differed between direct and indirect fitness proxies suggested an average 9.6% increase in variance in direct fitness, although this was statistically not significant. Previous meta-analyses of variance focusing on different stressors have also found similar increases in direct fitness, such as an 8% increase in longevity due to diet (Senior et al., 2017). Our results support the notion that, across stressors, variance effects seem particularly strong in direct vs indirect fitness proxies (e.g., 21% increase in reproduction due to multiple stressors, Sánchez-Tójar et al., 2020). A recent meta-analysis comparing urban and non-urban bird populations also found an overall increase in fitness, particularly in phenology (19.2% increase, Capilla-Lasheras et al., 2022). This effect may have been partially driven by exposure to anthropogenic noise. Thus, our results suggest that the predominant pattern across the available literature is a downward shift in average performance across traits, with an inconclusive increase in variance in direct fitness measures that should be further investigated.

This distinction is relevant to the potential evolutionary consequences of noise. Swaddle et al. (2015) proposed that anthropogenic noise can act as an agent of selection by altering survival and reproductive success and thereby potentially influencing evolutionary change. Our findings of reduced mean fitness and a tentative increase in direct fitness variance provide empirical support for two important components of this conceptual framework, with the latter suggesting increased opportunity for selection. Whether or not noise exposure alters evolutionary trajectories will ultimately depend on whether noise-induced differences in fitness are associated with heritable variation, and on whether individuals or populations can respond adaptively. The evolutionary consequences may nevertheless be substantial if noise exposure is persistent and spatially widespread. Selection imposed by noise pollution could favour traits that reduce acoustic interference or physiological costs, alter signalling strategies, or increase tolerance of noisy environments. Such responses could in turn influence population differentiation and community composition. These possibilities remain largely untested,

however, and our results should be interpreted as evidence that noise can generate a potential selective pressure rather than evidence that adaptive evolution is already occurring.

Limitations and priorities for future research

Several limitations constrain the extent to which our findings can be generalised across birds. Most importantly, the evidence base remains taxonomically uneven. Although our synthesis included 45 species, two species accounted for a disproportionately large number of effect sizes, and 67% of species were represented by only a single study. Our multilevel meta-analytic approaches can account for nonindependence among effect sizes, but they cannot fully compensate for a literature in which evidence is concentrated in a small number of well-studied species. This issue is also apparent in previous syntheses. Madden et al. (2026) found that species traits and ecological characteristics can strongly mediate non-directional responses to noise. Importantly, Madden et al. (2026) included both observational and experimental studies, and investigated a large set of behavioural traits (e.g., aggression, foraging, cognition) for which the relationship with fitness was treated as unknown. Expanding experimental research of fitness-related traits across a broader range of taxa, habitats, and noise sources is essential for determining the generality of the patterns identified in our pre-registered meta-analysis.

A second limitation concerns the distinction between fitness proxies and fitness. We deliberately included morphological and growth, parental-investment, and physiological measures, but contrary to previous syntheses (Kunc & Schmidt, 2019; Madden et al., 2026), we only included traits for which their relationship with fitness had a well-established directional prediction. Including directional fitness proxies in addition to reproduction and survival estimates allowed us to increase the breadth of the evidence base and test whether noise effects extend across levels of biological organisation. Furthermore, as the first noise meta-analysis focusing exclusively on experiments, our study makes a decisive step towards understanding the causal relationship between anthropogenic noise and fitness in birds. Nevertheless, the indirect, fitness-related measures should not be regarded as interchangeable with reproductive success or survival. Establishing the population-level consequences of noise will ultimately require more experiments that measure demographic parameters directly and, ideally, follow individuals across substantial portions of their life cycles.

Finally, experimental exposure to noise does not necessarily reproduce the complexity of anthropogenic soundscapes. In the real world, noise often occurs alongside habitat modification, artificial light, chemical pollution, human disturbance, and other environmental changes. Although our experimentally focused meta-analytic approach is a major strength for isolating the causal effect of noise, it also means that the estimated effects may not capture interactions among multiple stressors. This is particularly relevant because anthropogenic drivers frequently co-occur and may interact in ways that cannot be inferred from single-stressor experiments alone (Swaddle et al., 2015). Additionally, the high proportion of missing data for several moderators limited the number of variables that could be analysed simultaneously, necessitating multiple uni-moderator models and preventing a more comprehensive assessment of their combined effects. Future work should therefore combine experimental isolation of noise effects with factorial and field-based approaches capable of testing how acoustic pollution interacts with other components of global environmental change.

Noise pollution as a component of global change

Taken together, our findings demonstrate that anthropogenic noise can impose measurable fitness costs on birds. The consistency of negative effects across direct (reproduction and survival) and indirect measures (morphology and growth, parental investment, and physiology), together with the stronger responses to ecologically relevant noise, suggests that acoustic pollution can influence organismal performance through multiple pathways while remaining fundamentally dependent on the sensory and ecological context of exposure. Although tentative, the effect of noise on variance in direct fitness further hints that noise could increase the opportunity for selection, highlighting an important avenue for future research.

Given the widespread and increasing distribution of noise pollution (EEA, 2020), even relatively small average effects may have important consequences when experienced repeatedly by individuals and populations. More broadly, our results support a shift in how anthropogenic noise is conceptualised within global change biology. Environmental degradation does not require physical transformation of habitat; human activities can alter the sensory environment while leaving the visible structure of ecosystems largely intact. By demonstrating that such sensory modification can translate into reduced fitness, our study identifies anthropogenic noise as a biologically meaningful component of global environmental change. Noise pollution should therefore be considered alongside more conspicuous drivers of global change as a potentially important force shaping the performance, persistence, and dynamics of wildlife populations.

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Conflict of interest: The authors declare having no conflict of interest

Supplementary information

Appendix S1. Predictions

Appendix S2. Search Strategy and Study Selection Details

Appendix S3. Data Extraction Details

Appendix S4. Supplementary Analyses

Appendix S5. Author correspondence email template

Appendix S6. Keyword search strings

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Supplementary Materials for:

Noise as a global change driver: a meta-analysis of its fitness consequences for birds

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S1: Predictions

Hypothesis 1: Noise negatively affects bird fitness, also increasing the opportunity for selection

- P1. We predict that experimental exposure of birds to noise will lead to reduced fitness regardless of whether direct or indirect fitness proxies are used (intercept-only mean model)
- P2. We predict that experimental exposure of birds to noise will lead to higher variance in fitness compared to control groups regardless of whether direct or indirect fitness proxies are used (intercept-only variance model)
- P3. We predict that the negative effect of noise on fitness is larger when fitness is measured directly than when it is measured indirectly (factor: Outcome_level)
- P4. We predict that the increased variance in fitness due to noise is larger when fitness is measured directly than when it is measured indirectly (factor: Outcome_level)
- P5. We predict that the negative effect of noise on fitness differs among fitness proxy categories, from larger to smaller effects being observed for: direct fitness proxies, parental investment, morphology and growth, and physiology (factor: Outcome_4)
- P6. We predict that the variance effect of noise on fitness differs among fitness proxy categories, from larger to smaller variance effects being observed for: direct fitness proxies, parental investment, morphology and growth, and physiology (factor: Outcome_4)

Hypothesis 2: Noise's negative effects on bird fitness are stronger early in life

- P7. We predict that the negative effect of noise on fitness is larger in juveniles than in adults (factor: Bird_age_category)
- P8. We predict that the negative effect of noise on fitness becomes smaller as time passes from hatching (continuous: Bird_age_2)

Hypothesis 3: Noise's negative effects on bird fitness are additive

- P9. We predict that the negative effect of noise on fitness is larger when noise exposure takes place over the whole breeding period, followed by treatments taking place post-hatching, and then pre-hatching (factor: Broadcast_period_3)
- P10. We predict that the negative effect of noise on fitness is larger, the longer the individual has been exposed to noise (continuous: Spl_time_after_noise_2)
- P11. We predict that the negative effect of noise on fitness is larger, the louder the noise treatments are (dB; continuous: Expe_noise_mean_2).
- P12. We predict that the negative effect of noise on fitness is larger, the larger the difference between the control and the noise treatments is (dB; continuous: Dif_noise_mean).

Hypothesis 4: Noise's negative effects on bird fitness differ across different methods

We will conduct several analyses on subsets of suitable data for each analysis, provided we have sufficient effect sizes per moderator level (i.e., at least 5 effect sizes per moderator level). These analyses will focus on a series of methodological differences, some of which could be considered as categories of risk of bias (more in Culina et al. 2026), between studies that are expected to lead to differences in effect sizes:

- P13. We predict that experimental designs using true and ecologically relevant noise sources (e.g., traffic, industrial) will lead to a larger negative effect on bird fitness than synthetic noise and unnatural noise sources (e.g., pink, white; factor: Noise_type_3).
- P14. For studies using true and ecologically relevant noise sources, we predict a difference in the magnitude of the negative effects of noise on bird fitness between different types of true and ecologically relevant noise sources (i.e., traffic, industrial, traffic & industrial, military; factor: Noise_type_4), but we have no specific directional expectation.
- P15. We predict a difference in the magnitude of the negative effects of noise on bird fitness between studies conducted in the wild versus in the laboratory, but we have no specific directional expectation (factor: Captive_generation_2). On the one hand, wild animals are exposed to a greater number of additional stressors (e.g., predation, parasites, disease, starvation, temperature extremes, aggression), and noise may act as the straw that breaks the camel's back, resulting in stronger effects in the wild. On the other hand, laboratory studies are often conducted with birds bred in captivity for many generations, which may have reduced their resilience through relaxed selection, potentially resulting in stronger effects in the lab. For studies conducted in the laboratory, we predict stronger negative effects of noise on bird fitness in captive-bred populations than in wild-caught populations. Beyond potentially reduced resilience due to relaxed selection, wild-caught birds are more accustomed to natural

variation in ambient noise levels (e.g., wind, rain, thunderstorms) and may therefore be less physiologically stressed when exposed to increased noise in a laboratory setting.

- P16. We predict stronger negative effects of noise on bird fitness in studies that measured sound pressure levels inside versus outside the nest (factor: SPLm_pos_2). Inside-nest measurements are more biologically relevant as they better reflect the noise levels actually received by the birds. For studies using nest boxes in particular, outside measurements are likely to overestimate received noise levels, since the box itself attenuates environmental sound. As a result, outside measurements may yield an apparent mismatch between measured and received noise, potentially leading to an underestimation of effect sizes in studies relying on outside measurements.

Hypothesis 5: The literature on the noise fitness effects of birds suffers from publication biases

- P17. We predict that there is asymmetry in the funnel plot, indicating the existence of small-study effects. This is because we expect that studies on small numbers of individuals with statistically nonsignificant results tend to remain unpublished (continuous: effective_N).
- P18. We predict that evidence for a negative effect of noise on fitness has decreased since first tested. That is, that effect sizes have become smaller over time, providing evidence of a decline effect (continuous: Year.c).
- P19. We predict larger effect sizes from studies reporting data incompletely (e.g., missing effect sizes, relationships reported as simply 'non-significant') than from studies (presumably) reporting data in full. This test will be done at the study level (factor: ES_source_2).

S2: Search Strategy and Study Selection Details

The study selection process is shown in the PRISMA diagram in Figure S1.

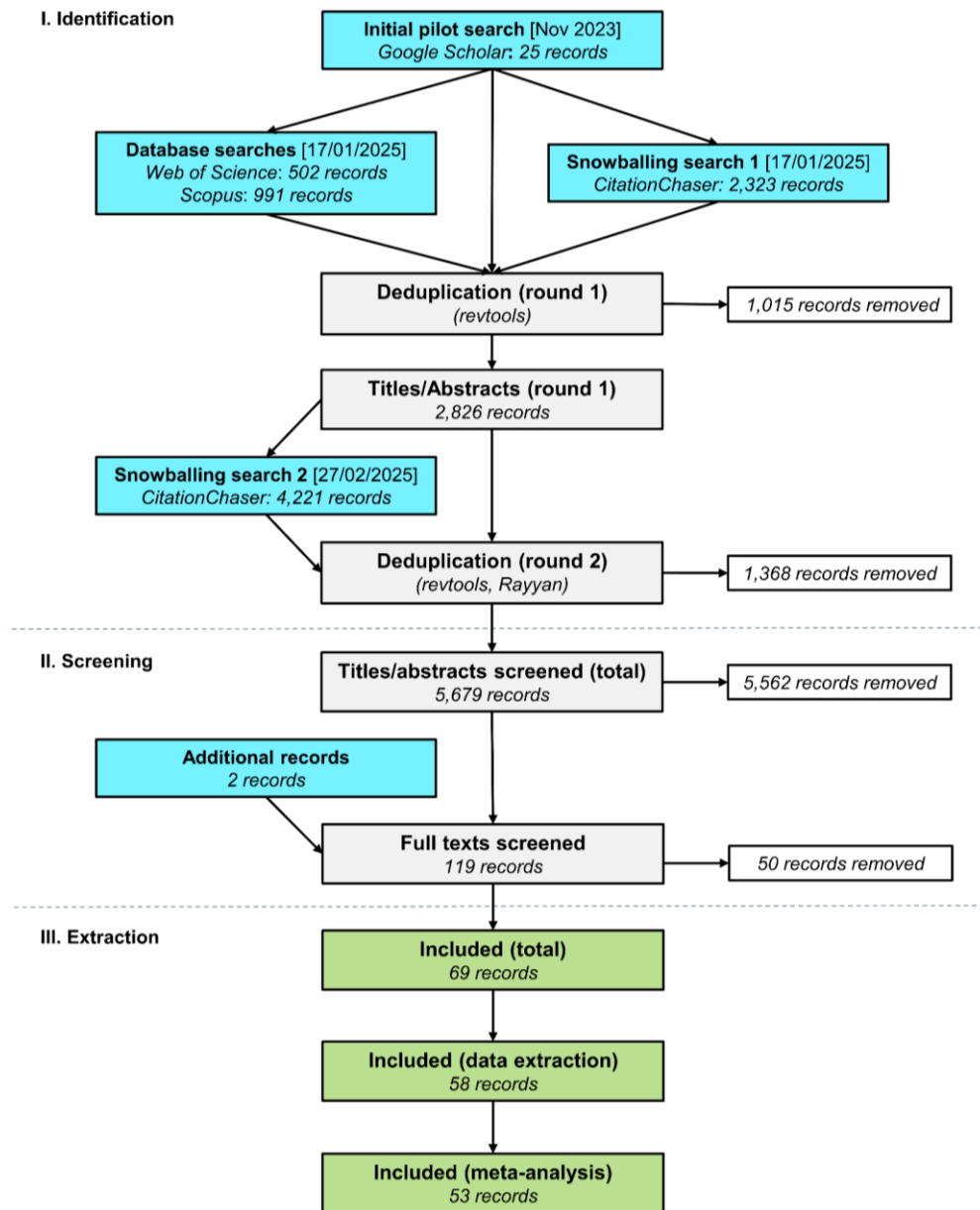


Figure S1: PRISMA diagram for the systematic review process. Initial pilot searches were conducted to identify a set of relevant studies, which was used to design database search queries. Round 1 of snowballing searches includes 1280 backwards snowballing records, and 1043 forwards snowballing records. Round 2 of snowballing was based on a set of 27 reviews and meta-analyses relevant to the research question, which were identified from within the initial set of 2,862 records. These were deduplicated to provide an additional 2,853 records for title-abstract screening. Two additional records were included during the full text screening/data extraction phases. These were both theses that were linked to other included studies. 11 studies were found to meet exclusion criteria but not included for data extraction. Data from these studies were also published in another included record, so only one study was included for extraction to avoid duplicated effect sizes. 5 additional studies were included for data extraction, but no effect sizes could be calculated from the data extracted (e.g., due to insufficient/incomplete data reporting).

Database searches were conducted in Scopus and Web of Science on the 17th of January, 2025, finding 502 and 991 records, respectively.

The following inclusion criteria were applied at the title-and-abstract screening stage.

1. Is the paper written in English, German, Spanish, Korean or Italian?
2. Does the paper report primary empirical data (i.e., not a review, meta-analysis, or purely theoretical study)?
3. Is the study species a bird, and not a farm animal in a farm/production setting?
4. Does the study assess the effect of noise specifically (i.e., not a generalised urban vs rural contrast; or ALAN)?
5. Does the study measure a measure of fitness or a fitness-related indicator (e.g., clutch size, productivity, fledgling success, recruitment rate, breeding success, longevity, body size, body mass, body condition, growth rate, etc)?
6. Does the study have a control group or explore noise gradients?

The following additional inclusion criteria were applied at the full-text screening stage.

1. Is the full text available (after thorough search, including contacting authors)?
2. Is the paper written in English, German, Spanish, Korean or Italian?
3. Is noise quantified and measured in dB or dB(A)?
4. Are noise levels manipulated experimentally?

S3: Data Extraction Details

The following variables were extracted from all studies (note that not all variables are used in the analyses, with some only being reported in the eventually provided open datasets):

- Species_latin: species latin name
- Lab_Wild: experiment in the lab or in the wild
- Captive_generation: (lab studies only) number of generations since captive (0, 1, 2, a lot)
- Latitude_N: decimal degrees
- Latitude_E: decimal degrees
- Altitude: meters above sea level (if reported)
- Season: wintering / pre-breeding /breeding / post-breeding. Refer to author's description
- Year_collection: first year of data collection
- LS_position: in nestbox / outside nestbox / distance to nestbox
- Noise_type: city / traffic / aircraft / white / other
- Group_compar_YN: is the study a group comparison (yes = 1, no = 0)
- dB_weight: e.g., A, F, C, Z
- dB_measure: e.g., Laeq or peakLA
- SPLm_pos: nestbox entrance / in nest / outside nest
- Broadcast_period: whole breeding / nest building / laying / incubation / nestling
- Ctrl_noise_min: min noise level of control group
- Ctrl_noise_max : max noise level of control group

- Ctrl_noise_mean: average noise level of control group
- Ctrl_noise_SD: standard deviation of control group
- Ctrl_noise_SE: standard error of control group
- Expe_noise_min: min noise level of experimental group
- Expe_noise_max: maximum noise level of experimental group
- Expe_noise_mean: average noise amplitude of experimental group
- Expe_noise_SD: standard deviation of experimental group
- Expe_noise_SE: standard error of experimental group
- PB_period: number of hours of noise per day / continuous
- Outcome: description of outcome measure/ fitness variable
- Outcome_unit: unit of the outcome measure/ fitness variable
- Transformation: if variable is transformed, including for modelling
- Bird_age: age of bird at measurement of outcome (in days / ad if adult / f if fledgling)
- Spl_time_after_noise: how long has the bird been exposed to noise in days
- Outcome_expected_sign_authors: direction of expected effect of noise according to authors 1 = expected increase with higher noise, -1 = expected decrease with higher noise

The following variables were also extracted as potential random effects/grouping factors:

- Lab_PI: likely primary principal investigator for study
- Pop_ID: description of specific population origin/location
- Group_ID: if several experiments are conducted with the same study using different groups of birds, give each group a unique identifier (e.g., if data is presented for 2 species, species 1 = A, species 2 = B)
- Shared_Ctrl_ID: if several treatment groups share one control group, give a unique identifier to each variable that shares a control group here (ID can be nested within Group_ID). If two rows within a Group_ID share a Shared_Ctrl_ID, the same control (or experimental) group are used across both rows.
- Shared_Ctrl_N: if several treatment groups share one control group, indicate the number of treatment groups that are sharing a control groups (note, where data includes shared experimental groups instead, or any other more complex design, this is noted here also).
- Repeated_trait_ID: if trait repeatedly measured across time, identify here (ID can be nested within Group_ID). If two rows within a Group_ID share a Repeated_trait_ID, the same variable is being measures in the same group of birds at two different time points relative to the noise treatment.

In addition to these, some additional data relating to the modelling details were also extracted, including inferential statistics (e.g., p-values, T, F, and chi-squared statistics) where they may be potentially used to calculate effect sizes in the absence of fully reported summary statistics or raw data.

A small number of studies included fully crossed treatment groups (e.g., early rearing x late rearing treatment groups). Marginalised means and errors were calculated to combine early and late treatment groups to include each treatment stage as distinct effect sizes in analysis, based on the equations in Pick et al. 2023 (as implemented in Moran et al. 2021).



Figure S2: Phylogenetic tree of the species included in the meta-analysis.

S4: Supplementary Analyses

S4. Hypothesis 1, P.1: lnRR

For lnRR, birds under an experimental increase in anthropogenic noise showed an average decrease in fitness estimates, but this was not statistically significant (figure SX; lnRR = -0.013 , 95% CI: $[-0.032, 0.006]$, 95% PI: $[-0.227, 0.202]$, p-value = 0.186, $k = 501$ effect sizes, $n = 51$ studies). Heterogeneity among effect sizes was low in absolute terms but high relative to sampling variance. Total raw heterogeneity (σ^2) was 0.012 ($Q = 1834.7$, p-value < 0.001), which fell in the lowest 5% of empirically derived estimates. In contrast, relative heterogeneity ($I^2_{\text{total}} = 92.5\%$) lay between the 35th and 40th percentile, and standardised heterogeneity metrics ($CVH2_{\text{total}} = 73.68$; $M2_{\text{total}} = 0.99$) lay between the 90th and 95th percentile of empirically derived estimates (Yang et al. 2025).

S4. Hypotheses 1-3, P.3, P.5-P.12: lnRR

Table S1a. Meta-regression models containing categorical moderators fitted without an intercept, giving the estimate of lnRR for each level.

Model	Term	Estimate	P-value	95% CI	k	n
Fitness proxy level (H1, P3)	direct	-0.017	0.394	-0.056, 0.022	136	27
	indirect	-0.012	0.234	-0.032, 0.008	365	43
Fitness proxy category (H1, P5)	fitness	-0.020	0.327	-0.059, 0.020	136	27
	morphology	-0.005	0.679	-0.028, 0.018	168	21
	parental investment	-0.013	0.544	-0.054, 0.029	103	19
	physiology	-0.053	0.034	-0.102, -0.004	94	22
Bird stage (H2, P7)	post-fledging	-0.010	0.380	-0.031, 0.012	343	46
	pre-fledging	-0.018	0.181	-0.044, 0.008	158	23
Noise treatment extent (H3, P9)	post-hatching	-0.005	0.801	-0.043, 0.034	151	18
	pre-hatching	-0.037	0.198	-0.093, 0.019	56	7
	unclear	-0.110	0.042	-0.216, -0.004	15	5
	whole-breeding	-0.007	0.656	-0.036, 0.023	252	23

Note. Values in bold indicate $p < 0.05$ or a 95% confidence interval (CI) not overlapping zero. k = number of effect sizes; n = number of studies; NA = not applicable.

Table S1b. Meta-regression models containing continuous moderators for lnRR.

Model	Term	Estimate	P-value	95% CI	k	n
Time after hatching (H2, P8)	intercept	-0.010	0.384	-0.033, 0.013	270	33
	Bird age 2	-0.000	0.893	-0.000, 0.000	NA	NA
Time of exposure (H3, P10-P11)	intercept	0.098	0.428	-0.145, 0.341	289	32
	Spl time after noise 2	-0.005	0.112	-0.011, 0.001	NA	NA
	Expe noise mean 2	-0.002	0.356	-0.005, 0.002	NA	NA
	Spl time after noise 2 * Expe noise mean 2	0.000	0.081	-0.000, 0.000	NA	NA
Noise treatment (H3, P12)	intercept	-0.001	0.973	-0.040, 0.039	285	25
	Dif noise mean	-0.000	0.857	-0.002, 0.002	NA	NA

Note. Values in bold indicate $p < 0.05$ or a 95% confidence interval (CI) not overlapping zero. k = number of effect sizes; n = number of studies.

S4. Hypothesis 1, P.2, P.4 and P.6: lnVR

For lnVR, the intercept-only meta-analysis of variance showed an average small and statistically non-significant increase in variance in fitness proxies among birds under anthropogenic noise (Hypothesis 1, P.2; figure SX; lnVR = 0.042, 95% CI: [-0.017, 0.101], 95% PI: [-0.552, 0.635], p-value = 0.166, k = 501 effect sizes, n = 51 studies). Heterogeneity among effect sizes was low to high. Total raw heterogeneity (σ^2) was 0.090 ($Q = 2295.9$, p-value < 0.001), and although I^2 suggested low heterogeneity ($I^2_{\text{total}} = 69.4\%$), the other standardised heterogeneity metrics suggested high levels of heterogeneity ($CVH2_{\text{total}} = 52.2$; $M2_{\text{total}} = 0.98$; Yang et al. 2025).

Table S2a. Meta-regression models containing categorical moderators fitted without an intercept, giving the estimate of lnVR for each level.

Model	Term	Estimate	P-value	95% CI	k	n
Fitness proxy level (H1, P4)	direct	0.068	0.141	-0.023, 0.158	136	27
	indirect	0.033	0.299	-0.030, 0.096	365	43
Fitness proxy category (H1, P6)	fitness	0.066	0.154	-0.025, 0.157	136	27
	morphology	0.066	0.141	-0.022, 0.154	168	21
	parental investment	-0.043	0.426	-0.147, 0.062	103	19
	physiology	0.063	0.225	-0.039, 0.165	94	22

Note. Values in bold indicate $p < 0.05$ or a 95% confidence interval (CI) not overlapping zero. k = number of effect sizes; n = number of studies.

S4. Hypothesis 5, P.17-P.19: Publication biases

Table S3. Meta-regression models testing small-study, decline and reporting effects.

Model	Term	Estimate	P-value	95% CI	k	n
Small study effects	intercept	-0.100	0.113	-0.223, 0.024	535	53
	sqrt inv eff N	-0.057	0.785	-0.467, 0.353	NA	NA
Decline effects	intercept	-0.114	0.001	-0.182, -0.046	535	53
	Year c	-0.000	0.978	-0.011, 0.010	NA	NA
Reporting effects (without intercept)	complete	-0.118	0.004	-0.198, -0.038	380	40
	incomplete	-0.105	0.093	-0.227, 0.018	155	13

Note. Values in bold indicate $p < 0.05$ or a 95% confidence interval (CI) not overlapping zero. k = number of effect sizes; n = number of studies.

Table S4. Sensitivity analyses of the overall SMD(H) effect (intercept-only models; Hypothesis 1, Prediction 1).

Model	Estimate	P-value	95% CI	k	n
Data subsets					
Only relevant noise	-0.135	<0.001	-0.206, -0.065	448	44
Only among-group comparisons	-0.094	0.013	-0.168, -0.019	470	43
Only effect sizes passing the Geary test	-0.123	<0.001	-0.194, -0.052	454	47
Only relevant noise, among-group comparisons and effect sizes passing the Geary test	-0.099	0.109	-0.221, 0.022	347	33
Random effects removed					
Without the repeated trait ID random effect	-0.103	0.002	-0.169, -0.037	535	53
Without the shared control ID random effect	-0.116	<0.001	-0.182, -0.050	535	53
Without the repeated trait ID and shared control ID random effects	-0.098	0.002	-0.161, -0.035	535	53
Without the lab PI random effect	-0.114	<0.001	-0.181, -0.047	535	53
Without the shared control ID, repeated trait ID and lab PI random effects	-0.098	0.002	-0.161, -0.035	535	53
Combined					

Model	Estimate	P-value	95% CI	k	n
Only relevant noise, among-group comparisons and effect sizes passing the Geary test, and without the shared control ID, repeated trait ID and lab PI random effects	-0.091	0.123	-0.206, 0.025	347	33

Study excluded

Excluding one study that provides 21 effect sizes for 21 species	-0.121	<0.001	-0.190, -0.051	514	52
Excluding one study with complex figures from which it was difficult to extract effect sizes using metadigitise	-0.117	<0.001	-0.184, -0.049	532	52

Note. Values in bold indicate $p < 0.05$ or a 95% confidence interval (CI) not overlapping zero. k = number of effect sizes; n = number of studies.

Table S5. Meta-regression sensitivity analysis for Hypothesis 4, Prediction 16, model fitted without an intercept.

Model	Term	Estimate	P-value	95% CI	k	n
Noise measuring position	inside nest	-0.153	0.025	-0.287, -0.019	162	12
	nest entrance	-0.129	0.058	-0.262, 0.004	127	14
	outside nest	-0.054	0.329	-0.162, 0.054	205	22

Note. Values in bold indicate $p < 0.05$ or a 95% confidence interval (CI) not overlapping zero. k = number of effect sizes; n = number of studies.

Table S6. Meta-regressions for additional non-pre-registered sensitivity analyses, model fitted without an intercept

Model	Term	Estimate	P-value	95% CI	k	n
Effect size origin	independent	-0.093	0.017	-0.170, -0.017	470	43
	gradients	0.053	0.763	-0.293, 0.399	23	3
	dependent	-0.207	0.003	-0.342, -0.072	42	10
Geary test category	fail	-0.233	0.001	-0.364, -0.102	58	24
	pass	-0.100	0.004	-0.169, -0.032	454	47
Publication source	journal	-0.114	0.002	-0.184, -0.043	468	46
	thesis	-0.116	0.290	-0.332, 0.100	67	7

Note. Values in bold indicate $p < 0.05$ or a 95% confidence interval (CI) not overlapping zero. k = number of effect sizes; n = number of studies.

S5: Author correspondence email template

<<Study_ID>>

Email: <<CorrAuthEmail>>

Subject: <<AuthorsShort>> (<<Year>>) – data request for meta-analysis

Main text:

Dear <<CorrAuthName>>,

I am conducting a meta-analysis on the effects of anthropogenic noise on the fitness of birds, in collaboration with Dr Henrik Brumm (Max Planck Institute for Biological Intelligence, Germany) and Dr Alfredo Sánchez-Tójar (University of Coimbra, Portugal).

A study that you authored, <<Authors>> (<<Year>>) <<Title>>. <<Journal>>, contains data that would be valuable additions to this analysis, but before we can include and reference it, we require some additional information from the study.

Specifically, we would need the following information:

- <<UnreportedDataText>>.

Would it be possible for you to send us this information, or alternatively, the raw data, so that we can calculate these ourselves?

Your contribution will be acknowledged with a reference to your original publication in our published meta-analysis.

Your help would be greatly appreciated.

Kindly,

Nick

P.S. If you have any unpublished experimental data that could be used to test the fitness effects of anthropogenic noise on birds (means, SD or SE and sample sizes for treatments and controls), we would be very grateful if you could share it with us.

S6: Keyword search strings

The database-specific search queries are as follows:

Scopus:

TITLE-ABS-KEY (("songbird*" OR "passerine*" OR "bird*" OR "aves" OR "avian" OR "ornithol*" OR "passeriform*" OR "Accipiter" OR "Aegypius" OR "Aquila" OR "Aviceda" OR "Busarellus" OR "Butastur" OR "Buteo" OR "Buteogallus" OR "Chondrohierax" OR "Circaetus" OR "Circus" OR "Clanga" OR "Elanoides" OR "Elanus" OR "Gampsonyx" OR "Geranoaetus" OR "Geranospiza" OR "Gypaetus" OR "Gypohierax" OR "Gyps" OR "Haliaeetus" OR "Haliastur" OR "Harpagus" OR "Harpia" OR "Hieraetus" OR "Ictinaetus" OR "Ictinia" OR "Kaupifalco" OR "Leptodon" OR "Leucopternis" OR "Lophotriorchis" OR "Milvus" OR "Morphnarchus" OR "Morphnus" OR "Necrosyrtes" OR "Neophron" OR "Nisaetus" OR "Parabuteo" OR "Pernis" OR "Pithecopaga" OR "Polemaetus" OR "Pseudastur" OR "Rostrhamus" OR "Rupornis" OR "Sarcogyps" OR "Spilornis" OR "Spizaetus" OR "Stephanoaetus" OR "Terathopus" OR "Torgos" OR "Trigonoceps" OR "Cathartes" OR "Coragyps" OR "Gymnogyps" OR "Sarcoramphus" OR "Vultur" OR "Pandion" OR "Sagittarius" OR "Aix" OR "Alopochen" OR "Amazonetta" OR "Anas" OR "Anser" OR "Asarcornis" OR "Aythya" OR "Branta" OR "Bucephala" OR "Cairina" OR "Callonetta" OR "Cereopsis" OR "Chen" OR "Chenonetta" OR "Chloephaga" OR "Clangula" OR "Coscoroba" OR "Cyanochen" OR "Cygnus" OR "Dendrocygna" OR "Heteronetta" OR "Histrionicus" OR "Hymenolaimus" OR "Lophodytes" OR "Lophonetta" OR "Malacorhynchus" OR "Mareca" OR "Marmaronetta" OR "Melanitta" OR "Merganetta" OR "Mergellus" OR "Mergus" OR "Neochen" OR "Netta" OR "Nettapus" OR "Nomonyx" OR "Oxyura" OR "Plectropterus" OR "Polysticta" OR "Pteronetta" OR "Sarkidiornis" OR "Sibirionetta" OR "Somateria" OR "Spatula" OR "Tachyeres" OR "Tadorna" OR "Thalassornis" OR "Anhima" OR "Chauna" OR "Anseranas" OR "Aegotheles" OR "Aerodramus" OR "Aeronautes" OR "Apus" OR "Chaetura" OR "Collocalia" OR "Cypseloides" OR "Cypsiurus" OR "Hirundapus" OR "Panyptila" OR "Streptoprocne" OR "Tachornis" OR "Tachymarpis" OR "Hemiprocne" OR "Abeillia" OR "Adelomyia" OR "Aglaeactis" OR "Aglaiocercus" OR "Amazilia" OR "Androdon" OR "Anopetia" OR "Anthocephala" OR "Anthracothorax" OR "Archilochus" OR "Atthis" OR "Augastes" OR "Avocettula" OR "Basilinna" OR "Boissonneaua" OR "Calliphlox" OR "Calypte" OR "Campylopterus" OR "Chaetocercus" OR "Chalcostigma" OR "Chalybura" OR "Chlorestes" OR "Chlorostilbon" OR "Chrysolampis" OR "Chrysurnia" OR "Clytolaema" OR "Coeligena" OR "Colibri" OR "Cyanophaia" OR "Cynanthus" OR "Discosura" OR "Doricha" OR "Doryfera" OR "Elvira" OR "Ensifera" OR "Eriocnemis" OR "Eugenes" OR "Eulampis" OR "Eulidia" OR "Eupetomena" OR "Eupherusa" OR "Eutoxeres" OR "Florisuga" OR "Glaucis" OR "Goethalsia" OR "Goldmania" OR "Haplophaedia" OR "Heliactin" OR "Heliangelus" OR "Heliodoxa" OR "Heliomaster" OR "Heliophryx" OR "Hylocharis" OR "Juliamyia" OR "Klais" OR "Lafresnaya" OR "Lampornis" OR "Lamprolaima" OR "Lepidopyga" OR "Lesbia" OR "Leucippus" OR "Leucochloris" OR "Lophornis" OR "Mellisuga" OR "Metallura" OR "Microchera" OR "Myrmia" OR "Myrtis" OR "Ocreatus" OR "Opisthopora" OR "Oreonympha" OR "Oreotrochilus" OR "Orthorhynchus" OR "Oxygogon" OR "Panterpe" OR "Patagona" OR "Phaeochroa" OR "Phaethornis" OR "Phlogophilus" OR "Polyonymus" OR "Polytmus" OR "Pterophanes" OR "Ramphodon" OR "Ramphomicron" OR "Rhodopsis" OR "Sappho" OR "Schistes" OR "Selasphorus" OR "Sephanoides" OR "Stephanoxis" OR "Sternoclyta" OR "Taphrospilus" OR "Thalaurania" OR "Thaumastura" OR "Threnetes" OR "Topaza" OR "Trochilus" OR "Urochroa" OR "Urosticte" OR "Apteryx" OR "Anthracoceros" OR "Buceros" OR "Bycanistes" OR "Lophoceros" OR "Penelopides" OR "Rhabdotorrhinus" OR "Rhyticeros" OR "Tockus" OR "Bucorvus" OR "Phoeniculus" OR "Rhinopomastus" OR "Upupa" OR "Anrostomus" OR "Caprimulgus" OR "Chordeiles" OR "Eleothreptus" OR "Eurostopodus" OR "Hydropsalis" OR "Lurocalis" OR "Lyncornis" OR "Nyctidromus" OR "Nyctiphrynus" OR "Nyctipolus" OR "Nyctiprogne" OR "Phalaenoptilus" OR "Setopagis" OR "Systellura" OR "Uropsalis" OR "Nyctibius" OR "Batrachostomus" OR "Podargus" OR "Steatornis" OR "Cariama" OR "Casuarius" OR "Dromaius" OR "Aethia" OR "Alca" OR "Alle" OR "Brachyramphus" OR "Cephus" OR "Cerorhinca" OR "Fratrercula" OR "Pinguinus" OR "Ptychoramphus" OR "Synthliboramphus" OR "Uria" OR "Burhinus" OR "Anarhynchus" OR "Charadrius" OR "Elseynornis" OR "Erythrogonyx" OR "Hoploxypterus" OR "Oreopholus" OR "Peltodytes" OR "Phegornis" OR "Pluvialis" OR "Thinornis" OR "Vanellus" OR "Chionis" OR "Dromas" OR "Cursorius" OR "Glareola" OR "Rhinoptilus" OR "Stiltia" OR "Haematopus" OR "Actophilornis" OR "Hydrophasianus" OR "Irediparra" OR "Jacana" OR "Metopidius" OR "Microparra" OR "Anous" OR "Chlidonias" OR "Chroicocephalus" OR "Creagrus" OR "Gelochelidon" OR "Gygis" OR "Hydrocoloeus" OR "Hydroprogne" OR "Ichthyiaetus" OR "Larosterna" OR "Larus" OR "Leucophaeus" OR "Onychoprion" OR "Pagophila" OR "Phaetusa" OR "Rhodostethia" OR "Rissa" OR "Rynchops" OR "Sterna" OR "Sternula" OR "Thalasseus" OR "Xema" OR "Pedionomus" OR "Pluvianellus" OR "Pluvianus" OR "Himantopus" OR "Recurvirostra" OR "Nycticorax" OR "Rostratula" OR "Actitis" OR "Arenaria" OR "Bartramia" OR "Calidris" OR "Coenocorypha"

OR "Gallinago" OR "Limnodromus" OR "Limosa" OR "Lymnocryptes" OR "Numenius" OR "Phalaropus" OR "Scolopax" OR "Tringa" OR "Xenus" OR "Stercorarius" OR "Attagis" OR "Thinocorus" OR "Turnix" OR "Ciconia" OR "Ephippiorhynchus" OR "Jabiru" OR "Leptoptilos" OR "Mycteria" OR "Colius" OR "Urocolius" OR "Alectroenas" OR "Alopecoenas" OR "Caloenas" OR "Chalcophaps" OR "Claravis" OR "Columba" OR "Columbina" OR "Didunculus" OR "Drepanoptila" OR "Ducula" OR "Ectopistes" OR "Gallicolumba" OR "Geopelia" OR "Geophaps" OR "Geotrygon" OR "Goura" OR "Gymnophaps" OR "Hemiphaga" OR "Henicophaps" OR "Leptotila" OR "Leptotrygon" OR "Leucosarcia" OR "Lopholaimus" OR "Macropygia" OR "Metriopelia" OR "Ocyphaps" OR "Oena" OR "Otidiphaps" OR "Patagioenas" OR "Petrophassa" OR "Pezophaps" OR "Phapitreron" OR "Phaps" OR "Ptilinopus" OR "Raphus" OR "Reinwardtoena" OR "Spilopelia" OR "Streptopelia" OR "Treron" OR "Trugon" OR "Turacoena" OR "Turtur" OR "Uropelia" OR "Zenaida" OR "Zentrygon" OR "Actenoides" OR "Alcedo" OR "Caridonax" OR "Ceryle" OR "Ceyx" OR "Chloroceryle" OR "Cittura" OR "Corythornis" OR "Dacelo" OR "Halcyon" OR "Ispidina" OR "Lacedo" OR "Megaceryle" OR "Melidora" OR "Syma" OR "Tanyptera" OR "Todiramphus" OR "Atelornis" OR "Brachypteracias" OR "Geobiastes" OR "Coracias" OR "Eurystomus" OR "Merops" OR "Nyctornis" OR "Baryphthengus" OR "Electron" OR "Eumomota" OR "Hylomanes" OR "Momotus" OR "Todus" OR "Cacomantis" OR "Carpococcyx" OR "Centropus" OR "Cercococcyx" OR "Chrysococcyx" OR "Clamator" OR "Coccyua" OR "Coccyzus" OR "Coua" OR "Crotophaga" OR "Cuculus" OR "Dasylophus" OR "Dromococcyx" OR "Eudynamys" OR "Geococcyx" OR "Guira" OR "Hierococcyx" OR "Morococcyx" OR "Neomorphus" OR "Pachycoccyx" OR "Phaenicophaeus" OR "Piaya" OR "Rhinortha" OR "Scythrops" OR "Surniculus" OR "Tapera" OR "Urodynamis" OR "Zanclostomus" OR "Dinornis" OR "Anomalopteryx" OR "Emeus" OR "Eurypteryx" OR "Eurypyga" OR "Rhynchoceros" OR "Caracara" OR "Daptrius" OR "Falco" OR "Herpetotheres" OR "Ibycter" OR "Micrastur" OR "Microhierax" OR "Milvago" OR "Phalacrocorax" OR "Polihierax" OR "Spiziapteryx" OR "Aburria" OR "Chamaepetes" OR "Crax" OR "Mitu" OR "Nothocrax" OR "Oreophasis" OR "Ortalis" OR "Pauxi" OR "Penelope" OR "Penelopina" OR "Pipile" OR "Alectura" OR "Megapodius" OR "Acryllium" OR "Guttera" OR "Numida" OR "Callipepla" OR "Colinus" OR "Cyrtonyx" OR "Dendrortyx" OR "Odontophorus" OR "Oreortyx" OR "Philortyx" OR "Ptilopachus" OR "Rhynchortyx" OR "Alectoris" OR "Ammoperdix" OR "Arborophila" OR "Argusianus" OR "Bambusicola" OR "Bonasa" OR "Caloperdix" OR "Centrocerus" OR "Chrysolophus" OR "Coturnix" OR "Crossoptilon" OR "Dendragapus" OR "Excalfactoria" OR "Falcipennis" OR "Francolinus" OR "Gallus" OR "Haematortyx" OR "Ithaginis" OR "Lagopus" OR "Lerwa" OR "Lophophorus" OR "Lophura" OR "Lyrurus" OR "Meleagris" OR "Pavo" OR "Peliperdix" OR "Perdix" OR "Phasianus" OR "Polyplectron" OR "Pternistis" OR "Pucrasia" OR "Rhizothera" OR "Rollulus" OR "Scleroptila" OR "Syrmaticus" OR "Tetrao" OR "Tetraogallus" OR "Tetraophasis" OR "Tragopan" OR "Tympanuchus" OR "Gavia" OR "Aramus" OR "Anthropoides" OR "Antigone" OR "Balearica" OR "Bucconides" OR "Grus" OR "Leucogeranus" OR "Heliornis" OR "Psophia" OR "Aenigmatolimnas" OR "Amaurolimnas" OR "Amauornis" OR "Anurolimnas" OR "Aramides" OR "Atlantisia" OR "Coturnicops" OR "Crex" OR "Dryolimnas" OR "Eulabeornis" OR "Fulica" OR "Gallicrex" OR "Gallinula" OR "Gallirallus" OR "Laterallus" OR "Lewinia" OR "Micropygia" OR "Neocrex" OR "Nesoclopeus" OR "Paragallinula" OR "Pardirallus" OR "Porphyrio" OR "Porphyriops" OR "Porzana" OR "Rallidula" OR "Rallina" OR "Rallus" OR "Tribonyx" OR "Canirallus" OR "Sarothrura" OR "Leptosomus" OR "Corythaeola" OR "Corythaixoides" OR "Crinifer" OR "Musophaga" OR "Tauraco" OR "Opisthocomus" OR "Afrotis" OR "Ardeotis" OR "Chlamydotis" OR "Neotis" OR "Otis" OR "Tetrax" OR "Acanthisitta" OR "Pachyplichas" OR "Traversia" OR "Xenicus" OR "Acanthiza" OR "Acanthornis" OR "Aethomyias" OR "Aphelocephala" OR "Calamanthus" OR "Gerygone" OR "Hylacola" OR "Neosericornis" OR "Oreoscopus" OR "Origma" OR "Pachycare" OR "Pycnoptilus" OR "Pyrrholaemus" OR "Sericornis" OR "Smicronis" OR "Acrocephalus" OR "Arundinax" OR "Calamonastides" OR "Hippolais" OR "Iduna" OR "Nesillas" OR "Aegithalos" OR "Leptopoeile" OR "Psaltiriparus" OR "Aegithina" OR "Alaemon" OR "Alauda" OR "Alaudala" OR "Ammomanes" OR "Calandrella" OR "Calendulauda" OR "Chersomanes" OR "Eremophila" OR "Eremopterix" OR "Galerida" OR "Lullula" OR "Melanocorypha" OR "Mirafr" OR "Pinarocorys" OR "Spizocorys" OR "Artamus" OR "Gymnorhina" OR "Melloria" OR "Bombycilla" OR "Buphagus" OR "Calcarius" OR "Plectrophenax" OR "Rhynchophanes" OR "Callaeas" OR "Heteralocha" OR "Philesturnus" OR "Calyptrichus" OR "Campephaga" OR "Cebalepyris" OR "Coracina" OR "Edolisoma" OR "Lalage" OR "Malindangia" OR "Pericrocotus" OR "Amaurospiza" OR "Cardinalis" OR "Caryothraustes" OR "Chlorothraupis" OR "Cyanococcyz" OR "Cyanoloxia" OR "Granatellus" OR "Habia" OR "Passerina" OR "Periporphyrus" OR "Pheucticus" OR "Piranga" OR "Spiza" OR "Certhia" OR "Salpinctes" OR "Abroscopus" OR "Cettia" OR "Horornis" OR "Phyllergates" OR "Tesia" OR "Urosphena" OR "Chloropsis" OR "Cinclus" OR "Apalis" OR "Artisornis" OR "Camaroptera" OR "Cisticola" OR "Eremomela" OR "Heliolais" OR "Hypergerus" OR "Neomixis" OR "Oreolais" OR "Orthotomus" OR "Phragmacia" OR "Poliolais" OR "Prinia" OR "Schistolais" OR "Urolais" OR "Urorhipis" OR "Climacteris" OR "Cormobates" OR "Conopophaga" OR "Struthidea" OR "Aphelocoma" OR "Calocitta" OR "Cissa" OR "Coloeus" OR "Corvus" OR "Cyanocitta" OR "Cyanocorax" OR "Cyanolyca" OR "Cyanopica" OR

"Dendrocitta" OR "Garrulus" OR "Gymnorhinus" OR "Nucifraga" OR "Perisoreus" OR "Pica" OR "Platylophus" OR "Podoces" OR "Psilorhinus" OR "Ptilostomus" OR "Pyrrhocorax" OR "Urocissa" OR "Ampelioides" OR "Ampelion" OR "Carpornis" OR "Cephalopterus" OR "Conioptilon" OR "Cotinga" OR "Doliornis" OR "Gymnoderus" OR "Haematoderus" OR "Lipaugus" OR "Perissocephalus" OR "Phoenicircus" OR "Phytotoma" OR "Pipreola" OR "Porphyrolaema" OR "Procnias" OR "Pyroderus" OR "Querula" OR "Rupicola" OR "Snowornis" OR "Xipholena" OR "Zaratornis" OR "Dasyornis" OR "Diccaum" OR "Prionochilus" OR "Dicrurus" OR "Donacobius" OR "Dulus" OR "Emberiza" OR "Amadina" OR "Amandava" OR "Cryptospiza" OR "Erythrura" OR "Estrilda" OR "Euodice" OR "Euschistospiza" OR "Lagonosticta" OR "Lonchura" OR "Mandingo" OR "Neochmia" OR "Nesocharis" OR "Nigrita" OR "Ortygospiza" OR "Parmoptila" OR "Pyrenestes" OR "Pytilia" OR "Spermophaga" OR "Stagonopleura" OR "Taeniopygia" OR "Uraeginthus" OR "Calyptomena" OR "Cymbirhynchus" OR "Eurylaimus" OR "Psarisomus" OR "Serilophus" OR "Smithornis" OR "Chamaeza" OR "Formicarius" OR "Acanthis" OR "Agraphospiza" OR "Akialoa" OR "Bucanetes" OR "Carduelis" OR "Carpodacus" OR "Chloris" OR "Chlorodrepanis" OR "Chlorophonia" OR "Chrysocorythus" OR "Coccothraustes" OR "Crithagra" OR "Drepanis" OR "Eophona" OR "Euphonia" OR "Fringilla" OR "Haemorhous" OR "Hemignathus" OR "Himatione" OR "Leucosticte" OR "Linaria" OR "Linurgus" OR "Loxia" OR "Loxioides" OR "Loxops" OR "Magnumma" OR "Melamprosops" OR "Oreomystis" OR "Paroreomyza" OR "Pinicola" OR "Procarduelis" OR "Pseudonestor" OR "Psittirostra" OR "Pyrrhoptectes" OR "Pyrrhula" OR "Rhodopechys" OR "Rhodospiza" OR "Serinus" OR "Spinus" OR "Telespiza" OR "Anabacerthia" OR "Anabazenops" OR "Ancistrops" OR "Anumbius" OR "Aphrastura" OR "Asthenes" OR "Automolus" OR "Berlepschia" OR "Campylorhamphus" OR "Certhiasomus" OR "Certhiaxis" OR "Cinclodes" OR "Clibanornis" OR "Coryphistera" OR "Cranioleuca" OR "Deconychura" OR "Dendrexetastes" OR "Dendrocincla" OR "Dendrocolaptes" OR "Dendroplex" OR "Drymornis" OR "Drymotoxeres" OR "Furnarius" OR "Geocercia" OR "Geositta" OR "Glyphorhynchus" OR "Heliobletus" OR "Hellmayrea" OR "Hylexetastes" OR "Lepidocolaptes" OR "Leptasthenura" OR "Limnortites" OR "Limnornis" OR "Lochmias" OR "Margarornis" OR "Mazaria" OR "Megaxenops" OR "Metopothrix" OR "Microxenops" OR "Nasica" OR "Ochetorhynchus" OR "Phacellodomus" OR "Philydor" OR "Phleocryptes" OR "Premnoplex" OR "Premnornis" OR "Pseudasthenes" OR "Pseudocolaptes" OR "Pseudoseisura" OR "Pygarrhichas" OR "Roraimia" OR "Schoeniophylax" OR "Sclerurus" OR "Sittasomus" OR "Spartonoica" OR "Sylviorhynchus" OR "Synallaxis" OR "Syndactyla" OR "Tarphonimus" OR "Thripadectes" OR "Thripophaga" OR "Upucerthia" OR "Xenerpestes" OR "Xenops" OR "Xiphocolaptes" OR "Xiphorhynchus" OR "Grallaria" OR "Grallaricula" OR "Hylopezus" OR "Myrmothera" OR "Alopocheilidon" OR "Atticora" OR "Cecropis" OR "Delichon" OR "Haplocheilidon" OR "Hirundo" OR "Neochelidon" OR "Notiocheilidon" OR "Orocheilidon" OR "Petrocheilidon" OR "Phedina" OR "Progne" OR "Psilidoprocne" OR "Pseudhirundo" OR "Pseudochelidon" OR "Ptyonoprocne" OR "Riparia" OR "Stelgidopteryx" OR "Tachycineta" OR "Hylia" OR "Hypocolius" OR "Agelaioides" OR "Agelaius" OR "Agelastus" OR "Amblycercus" OR "Amblyramphus" OR "Anumara" OR "Cacicus" OR "Chrysomus" OR "Curaeus" OR "Dives" OR "Dolichonyx" OR "Euphagus" OR "Gnorimopsar" OR "Gymnomystax" OR "Hypopyrrhus" OR "Icterus" OR "Lamprosar" OR "Leistes" OR "Macroagelaius" OR "Molothrus" OR "Nesopsar" OR "Oreopsar" OR "Psarocolius" OR "Pseudoleistes" OR "Quiscalus" OR "Sturnella" OR "Xanthocephalus" OR "Xanthopsar" OR "Icteria" OR "Ifrita" OR "Irena" OR "Corvinella" OR "Eurocephalus" OR "Lanius" OR "Actinodura" OR "Argya" OR "Garrulax" OR "Grammatoptila" OR "Heterophasia" OR "Ianthocincla" OR "Laniellus" OR "Leiothrix" OR "Liocichla" OR "Minla" OR "Pterorhinus" OR "Trochalopteron" OR "Turdoides" OR "Bradypterus" OR "Cincloramphus" OR "Helopsaltes" OR "Locustella" OR "Megalurus" OR "Poodytes" OR "Machaerirhynchus" OR "Graueria" OR "Hylia" OR "Macrosphenus" OR "Melocichla" OR "Sylvietta" OR "Chlorophoneus" OR "Dryoscopus" OR "Laniarius" OR "Malaconotus" OR "Nilaus" OR "Rhodophoneus" OR "Tchagra" OR "Telophorus" OR "Amytornis" OR "Chenorhamphus" OR "Clytomyias" OR "Malurus" OR "Stipiturus" OR "Melampitta" OR "Melanocharis" OR "Oedistoma" OR "Toxorhamphus" OR "Melanopareia" OR "Acanthagenys" OR "Acanthorhynchus" OR "Anthochaera" OR "Anthornis" OR "Caligavis" OR "Entomyzon" OR "Epthianura" OR "Glycifolia" OR "Gymnomyza" OR "Lichmera" OR "Manorina" OR "Melidectes" OR "Melilestes" OR "Meliphaga" OR "Melipotes" OR "Melithreptus" OR "Myzomela" OR "Nesoptilotis" OR "Philemon" OR "Phylidonyris" OR "Prothemadera" OR "Ptiloprora" OR "Ptilotula" OR "Pycnopygius" OR "Timeliopsis" OR "Xanthotis" OR "Menura" OR "Allenia" OR "Cincloerthia" OR "Dumetella" OR "Margarops" OR "Melanoptila" OR "Melanotis" OR "Mimus" OR "Oreoscoptes" OR "Ramphocinclus" OR "Toxostoma" OR "Lamprospiza" OR "Mitrospingus" OR "Moho" OR "Mohoua" OR "Arses" OR "Carterornis" OR "Clytorhynchus" OR "Grallina" OR "Hypothymis" OR "Monarcha" OR "Myiagra" OR "Symposiachrus" OR "Terpsiphone" OR "Trochocercus" OR "Anthus" OR "Macronyx" OR "Motacilla" OR "Alethe" OR "Anthipes" OR "Brachypteryx" OR "Calliope" OR "Campicoloides" OR "Cercotrichas" OR "Chamaetylas" OR "Copsychus" OR "Cossypha" OR "Cyanoptila" OR "Cyornis" OR "Enicurus" OR "Erithacus" OR "Eumyias" OR "Ficedula" OR "Fraseria" OR "Irania" OR "Larvivora" OR "Leonardina" OR "Luscinia" OR "Melaenornis" OR "Monticola" OR "Muscicapa"

OR "Myiomela" OR "Myioparus" OR "Myophonus" OR "Myrmecocichla" OR "Niltava" OR "Oenanthe" OR "Phoenicurus" OR "Pogonocichla" OR "Saxicola" OR "Sheppardia" OR "Sholicola" OR "Stiphornis" OR "Tarsiger" OR "Thamnolaea" OR "Vauriella" OR "Aethopyga" OR "Anabathmis" OR "Anthreptes" OR "Arachnothera" OR "Chalcomitra" OR "Cinnyris" OR "Cyanomitra" OR "Deleornis" OR "Hedydipna" OR "Kurochkinogramma" OR "Leptocoma" OR "Nectarinia" OR "Daphoenositta" OR "Nesospingus" OR "Nicator" OR "Notiomystis" OR "Aleadryas" OR "Oriolus" OR "Pitohui" OR "Sphecotheres" OR "Turnagra" OR "Colluricincla" OR "Falcunculus" OR "Melanorectes" OR "Pachycephala" OR "Pseudorectes" OR "Panurus" OR "Cicinnurus" OR "Diphyllodes" OR "Manucodia" OR "Paradisaea" OR "Ptiloris" OR "Paramythia" OR "Pardalotus" OR "Baeolophus" OR "Cephalopyrus" OR "Cyanistes" OR "Lophophanes" OR "Machlolophus" OR "Melaniparus" OR "Melanochlora" OR "Pardaliparus" OR "Parus" OR "Periparus" OR "Poecile" OR "Pseudopodoces" OR "Sittiparus" OR "Sylviparus" OR "Basileuterus" OR "Cardellina" OR "Catharopeza" OR "Dendroica" OR "Geothlypis" OR "Helmitheros" OR "Leiostylypis" OR "Limnithlypis" OR "Mniotilta" OR "Myioborus" OR "Myiothlypis" OR "Oporornis" OR "Oreothlypis" OR "Parkesia" OR "Protonotaria" OR "Seiurus" OR "Setophaga" OR "Vermivora" OR "Aimophila" OR "Ammodramus" OR "Amphispiza" OR "Arremon" OR "Arremonops" OR "Artemisiospiza" OR "Atlapetes" OR "Calamospiza" OR "Chlorospingus" OR "Chondestes" OR "Junco" OR "Melospiza" OR "Melozone" OR "Oreothraupis" OR "Oriturus" OR "Passerculus" OR "Passerella" OR "Peucaea" OR "Pezopetes" OR "Pipilo" OR "Pooecetes" OR "Pselliophorus" OR "Rhynchospiza" OR "Spizella" OR "Spizelloides" OR "Xenospiza" OR "Zonotrichia" OR "Carpospiza" OR "Gymnoris" OR "Hypocryptadius" OR "Montifringilla" OR "Onychostruthus" OR "Passer" OR "Petronia" OR "Pyrgilauda" OR "Alcippe" OR "Gampsorhynchus" OR "Illadopsis" OR "Jabouilleia" OR "Kenopia" OR "Laticilla" OR "Malacocincla" OR "Malacopteron" OR "Napothera" OR "Pellorneum" OR "Rimtor" OR "Trichastoma" OR "Amalocichla" OR "Drymodes" OR "Eopsaltria" OR "Eugerygone" OR "Heteromyias" OR "Melanodryas" OR "Microeca" OR "Monachella" OR "Pachycephalopsis" OR "Peneoenanthe" OR "Peneothello" OR "Petroica" OR "Poecilodryas" OR "Tregellasia" OR "Peucedramus" OR "Microligea" OR "Phaenocophilus" OR "Xenoligea" OR "Phylloscopus" OR "Picathartes" OR "Antilophia" OR "Ceratopipra" OR "Chiroxiphia" OR "Chloropipo" OR "Corapipo" OR "Cryptopipo" OR "Heterocercus" OR "Illicura" OR "Lepidothrix" OR "Machaeropterus" OR "Manacus" OR "Masius" OR "Neopelma" OR "Pipra" OR "Pseudopipra" OR "Tyrannetes" OR "Xenopipo" OR "Erythropitta" OR "Hydornis" OR "Pitta" OR "Batis" OR "Platysteira" OR "Anaplectes" OR "Bubalornis" OR "Euplectes" OR "Malimbus" OR "Plocepasser" OR "Ploceus" OR "Quelea" OR "Sporopipes" OR "Pnoepyga" OR "Microbates" OR "Polioptila" OR "Ramphocaenus" OR "Garritornis" OR "Prunella" OR "Cinclosoma" OR "Ptilorrhoa" OR "Phainopepla" OR "Phainoptila" OR "Ptiliogonys" OR "Ailuroedus" OR "Amblyornis" OR "Ptilonorhynchus" OR "Sericulus" OR "Alophoixus" OR "Andropadus" OR "Arizelocichla" OR "Atimastillas" OR "Baeopogon" OR "Bleda" OR "Chlorocichla" OR "Criniger" OR "Eurillas" OR "Hemixos" OR "Hypsipetes" OR "Iole" OR "Ixos" OR "Neolestes" OR "Phyllastrephus" OR "Pycnonotus" OR "Spizixos" OR "Stelgidillas" OR "Tricholestes" OR "Regulus" OR "Anthoscopus" OR "Auriparus" OR "Remiz" OR "Rhagologus" OR "Eleoscytalopus" OR "Liosceles" OR "Psilorhamphus" OR "Pterotochos" OR "Scelorchilus" OR "Scytalopus" OR "Teledromas" OR "Rhipidura" OR "Rhodinocichla" OR "Sapayoa" OR "Sitta" OR "Spindalis" OR "Chelidorhynch" OR "Culicicapa" OR "Elminia" OR "Acridotheres" OR "Agropsar" OR "Ampeliceps" OR "Aplonis" OR "Basilonis" OR "Cinnyricinclus" OR "Creatophora" OR "Gracula" OR "Gracupica" OR "Hartlaubius" OR "Hylopsar" OR "Lamprotonis" OR "Leucopsar" OR "Mino" OR "Notopholia" OR "Onychognathus" OR "Pastor" OR "Poeoptera" OR "Rhabdornis" OR "Sarcops" OR "Scissirostrum" OR "Speculipastor" OR "Spodiopar" OR "Streptocitta" OR "Sturnia" OR "Sturnus" OR "Chamaea" OR "Chleuasicus" OR "Chloropeta" OR "Chrysomma" OR "Conostoma" OR "Fulvetta" OR "Lioparus" OR "Paradoxornis" OR "Pseudoalcippe" OR "Psittiparus" OR "Rhopophilus" OR "Sinosuthora" OR "Suthora" OR "Sylvia" OR "Teretistris" OR "Akletos" OR "Ampelornis" OR "Aprositornis" OR "Batara" OR "Cercomacra" OR "Cercomacroides" OR "Cymbilaimus" OR "Dichrozona" OR "Drymophila" OR "Dysithamnus" OR "Epinecrophylia" OR "Euchrepomis" OR "Formicivora" OR "Frederickena" OR "Gymnocichla" OR "Gymnopithys" OR "Hafferia" OR "Herpsilochmus" OR "Hylophylax" OR "Hypocnemis" OR "Hypocnemoides" OR "Hypoedaleus" OR "Isleria" OR "Mackenziaena" OR "Megastictus" OR "Microrhopias" OR "Myrmeciza" OR "Myrmelastes" OR "Myrmoborus" OR "Myrmochanes" OR "Myrmoderus" OR "Myrmophylax" OR "Myrmorchilus" OR "Myrmornis" OR "Myrmotherula" OR "Neotantes" OR "Oneillornis" OR "Percnostola" OR "Phaenostictus" OR "Phlegopsis" OR "Pithys" OR "Poliocrania" OR "Pygiptila" OR "Pyriglena" OR "Rhegmatorhina" OR "Rhopias" OR "Rhopornis" OR "Sakesphorus" OR "Sciaphylax" OR "Sclateria" OR "Sipia" OR "Taraba" OR "Thamnistes" OR "Thamnomanes" OR "Thamnophilus" OR "Willisornis" OR "Xenornis" OR "Anisognathus" OR "Bangsia" OR "Buthraupis" OR "Calochaetes" OR "Catamblyrhynchus" OR "Catamenia" OR "Charitospiza" OR "Chlorochrysa" OR "Chlorophanes" OR "Chlorornis" OR "Chrysiothlypis" OR "Cissopis" OR "Cnemoscopus" OR "Coereba" OR "Compsospiza" OR "Compsothraupis" OR "Conirostrum" OR "Conothraupis" OR "Coryphospingus" OR "Creurgops" OR "Cyanerpes" OR "Cyanicterus" OR "Cypsnagra" OR "Dacnis" OR

"Delothraupis" OR "Diglossa" OR "Diuca" OR "Dolospingus" OR "Donacospiza" OR "Dubusia" OR "Emberizoides" OR "Embernagra" OR "Eucometis" OR "Euneornis" OR "Geospiza" OR "Gubernatrix" OR "Haplospiza" OR "Hemispingus" OR "Hemithraupis" OR "Heterospingus" OR "Incaspiza" OR "Iridophanes" OR "Iridosornis" OR "Lanio" OR "Lophospingus" OR "Loxigilla" OR "Loxipasser" OR "Melanodera" OR "Melanospiza" OR "Melopyrrha" OR "Nemosia" OR "Nephelornis" OR "Oreomanes" OR "Oryzoborus" OR "Parkerthraustes" OR "Paroaria" OR "Phrygilus" OR "Piezorina" OR "Pipraeidea" OR "Poospiza" OR "Pyrrhocoma" OR "Ramphocelus" OR "Rhodospingus" OR "Saltator" OR "Saltatricula" OR "Schistochlamys" OR "Sericossypha" OR "Sicalis" OR "Sporophila" OR "Stephanophorus" OR "Tachyphonus" OR "Tangara" OR "Tersina" OR "Thlypopsis" OR "Thraupis" OR "Tiaris" OR "Trichothraupis" OR "Volatinia" OR "Wetmorethraupis" OR "Xenodacnis" OR "Xenospingus" OR "Tichodroma" OR "Macronus" OR "Pomatorhinus" OR "Spelaeornis" OR "Stachyridopsis" OR "Stachyris" OR "Iodopleura" OR "Laniisoma" OR "Laniocera" OR "Myiobius" OR "Onychorhynchus" OR "Oxyruncus" OR "Pachyramphus" OR "Schiffornis" OR "Terenotriccus" OR "Tityra" OR "Xenopsaris" OR "Campylorhynchus" OR "Cantorchilus" OR "Catherpes" OR "Cinnycerthia" OR "Cistothorus" OR "Cyphorhinus" OR "Henicorhina" OR "Microcerculus" OR "Odontorchilus" OR "Pheugopedius" OR "Salpinctes" OR "Thryomanes" OR "Thryophilus" OR "Thryothorus" OR "Trogodytes" OR "Uropsila" OR "Catharus" OR "Cichlopsis" OR "Entomodestes" OR "Geokichla" OR "Hylocichla" OR "Ixoreus" OR "Myadestes" OR "Neocossyphus" OR "Ridgwayia" OR "Sialia" OR "Stizorhina" OR "Turdus" OR "Zoothraupis" OR "Agriornis" OR "Alectrurus" OR "Anairetes" OR "Aphanotriccus" OR "Arundinicola" OR "Atalotriccus" OR "Attila" OR "Campostoma" OR "Casiempis" OR "Casiornis" OR "Cnemarchus" OR "Cnemotriccus" OR "Cnipodectes" OR "Colonia" OR "Colorhamphus" OR "Conopias" OR "Contopus" OR "Corythopsis" OR "Culicivora" OR "Deltarhynchus" OR "Elaenia" OR "Empidonax" OR "Empidonomus" OR "Euscarthmus" OR "Fluvicola" OR "Griseotyrannus" OR "Gubernetes" OR "Hemitriccus" OR "Heteroxolmis" OR "Hirundinea" OR "Hymenops" OR "Inezia" OR "Knipolegus" OR "Lathrotriccus" OR "Legatus" OR "Leptopogon" OR "Lessonia" OR "Lophotriccus" OR "Machetornis" OR "Mecocerculus" OR "Megarynchus" OR "Mionectes" OR "Mitrephanes" OR "Muscigralla" OR "Muscisaxicola" OR "Myiarchus" OR "Myiodynastes" OR "Myiopagis" OR "Myiophobus" OR "Myiornis" OR "Myiotheretes" OR "Myiotriccus" OR "Myiozetetes" OR "Neopipo" OR "Neoxolmis" OR "Nephelomyias" OR "Ochthoeca" OR "Ochthornis" OR "Oncostoma" OR "Ornithion" OR "Phaeomyias" OR "Philohydor" OR "Phyllomyias" OR "Phylloscartes" OR "Piprites" OR "Pitangus" OR "Platyrinchus" OR "Poecilotriccus" OR "Pogonotriccus" OR "Polioxolmis" OR "Polystictus" OR "Pseudelaenia" OR "Pseudocolaptes" OR "Pseudotriccus" OR "Pyrocephalus" OR "Pyrrhomyias" OR "Ramphotrigon" OR "Rhynchocyclus" OR "Rhytipterna" OR "Satrapa" OR "Sayornis" OR "Serpophaga" OR "Silvicultrix" OR "Sirystes" OR "Stigmatura" OR "Sublegatus" OR "Suiriri" OR "Tachuris" OR "Taeniotoxicus" OR "Todirostrum" OR "Tolmomyias" OR "Tumbezia" OR "Tyrannopsis" OR "Tyrannulus" OR "Tyrannus" OR "Uromyias" OR "Xenotriccus" OR "Xolmis" OR "Zimmerius" OR "Urocynchramus" OR "Artamella" OR "Callicolpus" OR "Cyanolanius" OR "Euryceros" OR "Falculea" OR "Hypositta" OR "Leptopterus" OR "Mystacornis" OR "Newtonia" OR "Oriolia" OR "Philetonia" OR "Prionops" OR "Pseudobias" OR "Schetba" OR "Tephrodornis" OR "Tylas" OR "Vanga" OR "Xenopirostris" OR "Anomalospiza" OR "Vidua" OR "Cyclarhis" OR "Erpornis" OR "Hylophilus" OR "Pteruthius" OR "Vireo" OR "Vireolanius" OR "Zeledonia" OR "Apalopteron" OR "Dasycrotapha" OR "Heleia" OR "Lophozosterops" OR "Sternoptilus" OR "Yuhina" OR "Zosterops" OR "Zosterornis" OR "Agamia" OR "Ardea" OR "Ardeola" OR "Botaurus" OR "Bubulcus" OR "Butorides" OR "Cochlearius" OR "Dupetor" OR "Egretta" OR "Gorsachius" OR "Ixobrychus" OR "Nyctanassa" OR "Nycticorax" OR "Ptilerodius" OR "Syrigma" OR "Tigriornis" OR "Tigrisoma" OR "Zebrius" OR "Balaeniceps" OR "Pelecanus" OR "Scopus" OR "Bostrychia" OR "Eudocimus" OR "Geronticus" OR "Lophotibis" OR "Mesembrinibis" OR "Nipponia" OR "Phimosus" OR "Platalea" OR "Plegadis" OR "Pseudibis" OR "Theristicus" OR "Threskiornis" OR "Phaethon" OR "Phoeniconaias" OR "Phoenicoparrus" OR "Phoenicopterus" OR "Bucco" OR "Chelidoptera" OR "Hapaloptila" OR "Hypnelus" OR "Malacoptila" OR "Micromonacha" OR "Monasa" OR "Nonnula" OR "Notharchus" OR "Nystalus" OR "Capito" OR "Eubucco" OR "Brachygalba" OR "Galbalcyrrhynchus" OR "Galbula" OR "Jacamaralcyon" OR "Jacamerops" OR "Indicator" OR "Melichneutes" OR "Meligonomon" OR "Prodotiscus" OR "Buccanodon" OR "Gymnobucco" OR "Lybius" OR "Pogoniulus" OR "Stactolaema" OR "Trachyphonus" OR "Psilopogon" OR "Blythipicus" OR "Campephilus" OR "Campethera" OR "Celeus" OR "Chloropicus" OR "Chrysocolaptes" OR "Chrysophlegma" OR "Colaptes" OR "Dendrocopos" OR "Dendrocopetes" OR "Dendropicos" OR "Dinopium" OR "Dryobates" OR "Dryocopus" OR "Gecinulus" OR "Geocolaptes" OR "Jynx" OR "Leiopicus" OR "Leucobotaptes" OR "Meiglyptes" OR "Melanerpes" OR "Micropternus" OR "Mulleripicus" OR "Nesocittes" OR "Picoides" OR "Piculus" OR "Picumnus" OR "Picus" OR "Reinwardtipicus" OR "Sasia" OR "Sphyrapicus" OR "Veniliornis" OR "Yungipicus" OR "Andigena" OR "Aulacorhynchus" OR "Pteroglossus" OR "Ramphastos" OR "Selenidera" OR "Semnornis" OR "Aechmophorus" OR "Podiceps" OR "Podilymbus" OR "Polioccephalus" OR "Rollandia" OR "Tachybaptus" OR "Diomedea" OR "Phoebastria" OR "Phoebetria" OR "Thalassarche" OR "Hydrobates" OR "Oceanodroma" OR "Fregetta" OR "Garrodia" OR "Nesofregetta" OR

"Oceanites" OR "Pelagodroma" OR "Aphrodroma" OR "Ardenna" OR "Bulweria" OR "Calonectris" OR "Daption" OR "Fulmarus" OR "Halobaena" OR "Macronectes" OR "Pachyptila" OR "Pagodroma" OR "Pelecanoides" OR "Procellaria" OR "Pseudobulweria" OR "Pterodroma" OR "Puffinus" OR "Thalassoica" OR "Cacatua" OR "Callocephalon" OR "Calyptorhynchus" OR "Eolophus" OR "Lophochroa" OR "Nymphicus" OR "Probosciger" OR "Alipiopsitta" OR "Amazona" OR "Anodorhynchus" OR "Ara" OR "Aratinga" OR "Bolborhynchus" OR "Brotogeris" OR "Conuropsis" OR "Cyanoliseus" OR "Cyanopsitta" OR "Deroptyus" OR "Diopsittaca" OR "Enicognathus" OR "Eupsittula" OR "Forpus" OR "Graydidascalus" OR "Guarouba" OR "Guaruba" OR "Hapalopsittaca" OR "Leptosittaca" OR "Myiopsitta" OR "Nannopsittaca" OR "Orthopsittaca" OR "Pionites" OR "Pionopsitta" OR "Pionus" OR "Poicephalus" OR "Primolius" OR "Psilopsiagon" OR "Psittacara" OR "Psittacus" OR "Pyrilia" OR "Pyrrhura" OR "Rhynchopsitta" OR "Thectocercus" OR "Touit" OR "Triclaria" OR "Agapornis" OR "Alisterus" OR "Aprosmictus" OR "Barnardius" OR "Bolbopsittacus" OR "Chalcopsitta" OR "Charmosyna" OR "Coracopsis" OR "Cyanoramphus" OR "Cyclopsitta" OR "Eclectus" OR "Eos" OR "Eunymphicus" OR "Geoffroyus" OR "Glossopsitta" OR "Lathamus" OR "Loriculus" OR "Lorius" OR "Melopsittacus" OR "Micrositta" OR "Neophema" OR "Neopsephotus" OR "Neopsittacus" OR "Northiella" OR "Oreopsittacus" OR "Parvipsitta" OR "Pezoporus" OR "Phigys" OR "Platycercus" OR "Polytelis" OR "Prioniturus" OR "Prosopieia" OR "Psephotellus" OR "Psephotus" OR "Pseudeos" OR "Psittacella" OR "Psittacula" OR "Psittaculirostris" OR "Psitteuteles" OR "Psittinus" OR "Psittichas" OR "Purpureicephalus" OR "Tanygnathus" OR "Trichoglossus" OR "Vini" OR "Nestor" OR "Strigops" OR "Pterocles" OR "Syrnhaptes" OR "Rhea" OR "Aptenodytes" OR "Eudytes" OR "Eudyptula" OR "Megadyptes" OR "Pygoscelis" OR "Spheniscus" OR "Aegolius" OR "Asio" OR "Athene" OR "Bubo" OR "Glaucidium" OR "Ketupa" OR "Lophostrix" OR "Megascops" OR "Micrathene" OR "Ninox" OR "Otus" OR "Pseudoscops" OR "Psiloscops" OR "Pulsatrix" OR "Sceloglaux" OR "Scotopelia" OR "Strix" OR "Surnia" OR "Xenoglaux" OR "Phodilus" OR "Tyto" OR "Aepyornis" OR "Mullerornis" OR "Struthio" OR "Anhinga" OR "Fregata" OR "Leucocarbo" OR "Microcarbo" OR "Nannopterum" OR "Phalacrocorax" OR "Morus" OR "Sula" OR "Crypturellus" OR "Eudromia" OR "Nothocercus" OR "Nothoprocta" OR "Nothura" OR "Rhynchotus" OR "Tinamotis" OR "Tinamus" OR "Apalharpactes" OR "Apaloderma" OR "Harpactes" OR "Pharomachrus" OR "Trogon" OR "Tetrastes" OR "Hesperiphona")

AND ("reproductive success" OR "growth" OR "mating success" OR "hatching success" OR "recruitment" OR "fertility" OR "mortality" OR "longevity" OR "body condition" OR "condition" OR "body size" OR "survival" OR "clutch size" OR "breeding success" OR "recruit*" OR "eggs laid" OR "number of eggs" OR "fitness" OR "fledgling*" OR "development")

AND ("anthropogenic noise" OR "traffic noise" OR "ambient noise" OR "urban noise" OR "noise pollution"))

Web of Science:

TI=(("songbird*" OR "passerine*" OR "bird*" OR "aves" OR "avian" OR "ornithol*" OR "passeriform*" OR "Accipiter" OR "Aegypius" OR "Aquila" OR "Aviceda" OR "Busarellus" OR "Butastur" OR "Buteo" OR "Buteogallus" OR "Chondrohierax" OR "Circaetus" OR "Circus" OR "Clanga" OR "Elanoides" OR "Elanus" OR "Gampsonyx" OR "Geranoaetus" OR "Geranoospiza" OR "Gypaetus" OR "Gypohierax" OR "Gyps" OR "Haliaeetus" OR "Haliastur" OR "Harpagus" OR "Harpia" OR "Hieraetus" OR "Ictinaetus" OR "Ictinia" OR "Kaupifalco" OR "Leptodon" OR "Leucopternis" OR "Lophotriorchis" OR "Milvus" OR "Morphnarchus" OR "Morphnus" OR "Necrosyrtes" OR "Neophron" OR "Nisaetus" OR "Parabuteo" OR "Pernis" OR "Pithecopaga" OR "Polemaetus" OR "Pseudastur" OR "Rostrhamus" OR "Rupornis" OR "Sarcogyps" OR "Spilornis" OR "Spizaetus" OR "Stephanoaetus" OR "Terathopius" OR "Torgos" OR "Trigonoceps" OR "Cathartes" OR "Coragyps" OR "Gymnogyps" OR "Sarcoramphus" OR "Vultur" OR "Pandion" OR "Sagittarius" OR "Aix" OR "Alopochen" OR "Amazonetta" OR "Anas" OR "Anser" OR "Asarcornis" OR "Aythya" OR "Branta" OR "Bucephala" OR "Cairina" OR "Callonetta" OR "Cereopsis" OR "Chen" OR "Chenonetta" OR "Chloephaga" OR "Clangula" OR "Coscoroba" OR "Cyanochen" OR "Cygnus" OR "Dendrocygna" OR "Heteronetta" OR "Histrionicus" OR "Hymenolaimus" OR "Lophodytes" OR "Lophonetta" OR "Malacorhynchus" OR "Mareca" OR "Marmaronetta" OR "Melanitta" OR "Merganetta" OR "Mergellus" OR "Mergus" OR "Neochen" OR "Netta" OR "Nettapus" OR "Nomonyx" OR "Oxyura" OR "Plectropterus" OR "Polysticta" OR "Pteronetta" OR "Sarkidiornis" OR "Sibirionetta" OR "Somateria" OR "Spatula" OR "Tachyeres" OR "Tadorna" OR "Thalassornis" OR "Anhima" OR "Chauna" OR "Anseranas" OR "Aegotheles" OR "Aerodramus" OR "Aeronautes" OR "Apus" OR "Chaetura" OR "Collocalia" OR "Cypseloides" OR "Cypsiurus" OR "Hirundapus" OR "Panyptila" OR "Streptoprocne" OR "Tachornis" OR "Tachymarpis" OR "Hemiprocne" OR "Abeillia" OR "Adelomyia" OR "Aglaeactis" OR "Aglaiocercus" OR "Amazilia" OR "Androdon" OR "Anopetia" OR "Anthocephala" OR "Anthracothorax" OR "Archilochus" OR "Atthis" OR "Augastes" OR "Avocettula" OR "Basilinna" OR "Boissonneaua" OR "Calliphlox" OR "Calypte" OR "Campylopterus" OR "Chaetocercus" OR "Chalcostigma" OR "Chalybura" OR "Chlorestes" OR

"Peliperdix" OR "Perdix" OR "Phasianus" OR "Polyplectron" OR "Pternistis" OR "Pucrasia" OR "Rhizothera" OR "Rollulus" OR "Scleroptila" OR "Syrmaticus" OR "Tetrao" OR "Tetraogallus" OR "Tetraophasis" OR "Tragopan" OR "Tympanuchus" OR "Gavia" OR "Aramus" OR "Anthropoides" OR "Antigone" OR "Balearica" OR "Bugeranus" OR "Grus" OR "Leucogeranus" OR "Helionis" OR "Psophia" OR "Aenigmatolimnas" OR "Amaurolimnas" OR "Amauornis" OR "Anurolimnas" OR "Aramides" OR "Atlantisia" OR "Coturnicops" OR "Crex" OR "Dryolimnas" OR "Eulabeornis" OR "Fulica" OR "Gallicrex" OR "Gallinula" OR "Gallirallus" OR "Laterallus" OR "Lewinia" OR "Micropygia" OR "Neocrex" OR "Nesoclopeus" OR "Paragallinula" OR "Pardirallus" OR "Porphyrio" OR "Porphyriops" OR "Porzana" OR "Rallacula" OR "Rallina" OR "Rallus" OR "Tribonyx" OR "Canirallus" OR "Sarothrura" OR "Leptosomus" OR "Corythaeola" OR "Corythaixoides" OR "Crinifer" OR "Musophaga" OR "Tauraco" OR "Opisthocomus" OR "Afrotis" OR "Ardeotis" OR "Chlamydotis" OR "Neotis" OR "Otis" OR "Tetrax" OR "Acanthisitta" OR "Pachyplichas" OR "Traversia" OR "Xenicus" OR "Acanthiza" OR "Acanthornis" OR "Aethomyias" OR "Aphelocephala" OR "Calamanthus" OR "Gerygone" OR "Hylacola" OR "Neosericornis" OR "Oreoscopus" OR "Origma" OR "Pachycare" OR "Pycnophilus" OR "Pyrrholaemus" OR "Sericornis" OR "Smicronis" OR "Acrocephalus" OR "Arundinax" OR "Calamonastides" OR "Hippolais" OR "Iduna" OR "Nesillas" OR "Aegithalos" OR "Leptopoecile" OR "Psaltiriparus" OR "Aegithina" OR "Alaemon" OR "Alauda" OR "Alaudala" OR "Ammomanes" OR "Calandrella" OR "Calendulauda" OR "Chersomanes" OR "Eremophila" OR "Eremopterix" OR "Galerida" OR "Lullula" OR "Melanocorypha" OR "Mirafraga" OR "Pinarocorys" OR "Spizocorys" OR "Artamus" OR "Gymnorhina" OR "Melloria" OR "Bombycilla" OR "Buphagus" OR "Calcarius" OR "Plectrophenax" OR "Rhynchophanes" OR "Callaeas" OR "Heteralocha" OR "Philesturnus" OR "Calyptophilus" OR "Campephaga" OR "Ceblepyris" OR "Coracina" OR "Edolisoma" OR "Lalage" OR "Malindangia" OR "Pericrocotus" OR "Amaurospiza" OR "Cardinalis" OR "Caryothraustes" OR "Chlorothraupis" OR "Cyanocompsa" OR "Cyanoloxia" OR "Granatellus" OR "Habia" OR "Passerina" OR "Periporphyrus" OR "Pheucticus" OR "Piranga" OR "Spiza" OR "Certhia" OR "Salpornis" OR "Abroscopus" OR "Cettia" OR "Horornis" OR "Phyllergates" OR "Tesia" OR "Urosphena" OR "Chloropsis" OR "Cinclus" OR "Apalis" OR "Artisornis" OR "Camaroptera" OR "Cisticola" OR "Eremomela" OR "Heliolais" OR "Hypergerus" OR "Neomixis" OR "Oreolais" OR "Orthotomus" OR "Phragmacia" OR "Poliolais" OR "Prinia" OR "Schistolais" OR "Urolais" OR "Urorhipis" OR "Climacteris" OR "Cormobates" OR "Conopophaga" OR "Struthidea" OR "Aphelocoma" OR "Calocitta" OR "Cissa" OR "Coloeus" OR "Corvus" OR "Cyanocitta" OR "Cyanocorax" OR "Cyanolyca" OR "Cyanopica" OR "Dendrocitta" OR "Garrulus" OR "Gymnorhinus" OR "Nucifraga" OR "Perisoreus" OR "Pica" OR "Platylophus" OR "Podoces" OR "Psilorhinus" OR "Ptilostomus" OR "Pyrrhocorax" OR "Urocissa" OR "Ampelioides" OR "Ampelion" OR "Carpornis" OR "Cephalopterus" OR "Conioptilon" OR "Cotinga" OR "Doliornis" OR "Gymnoderus" OR "Haematoderus" OR "Lipaugus" OR "Perissocephalus" OR "Phoenicircus" OR "Phytotoma" OR "Pipreola" OR "Porphyrolaema" OR "Procnias" OR "Pyroderus" OR "Querula" OR "Rupicola" OR "Snowornis" OR "Xipholena" OR "Zaratornis" OR "Dasyornis" OR "Dicaeum" OR "Prionochilus" OR "Dicrurus" OR "Donacobius" OR "Dulus" OR "Emberiza" OR "Amadina" OR "Amandava" OR "Cryptospiza" OR "Erythrura" OR "Estrilda" OR "Euodice" OR "Euschistospiza" OR "Lagonosticta" OR "Lonchura" OR "Mandingoa" OR "Neochmia" OR "Nesocharis" OR "Nigrita" OR "Ortygospiza" OR "Parmoptila" OR "Pyrenestes" OR "Pytilia" OR "Spermophaga" OR "Stagonopleura" OR "Taeniopygia" OR "Uraeginthus" OR "Calyptomena" OR "Cymbirhynchus" OR "Eurylaimus" OR "Psarisomus" OR "Serilophus" OR "Smithornis" OR "Chamaeza" OR "Formicarius" OR "Acanthis" OR "Agraphospiza" OR "Akialoa" OR "Bucanetes" OR "Carduelis" OR "Carpodacus" OR "Chloris" OR "Chlorodrepanis" OR "Chlorophonia" OR "Chrysocorythus" OR "Coccothraustes" OR "Crithagra" OR "Drepanis" OR "Eophona" OR "Euphonia" OR "Fringilla" OR "Haemorhous" OR "Hemignathus" OR "Himatione" OR "Leucosticte" OR "Linaria" OR "Linurgus" OR "Loxia" OR "Loxioides" OR "Loxops" OR "Magnumma" OR "Melamprosops" OR "Oreomystis" OR "Paroreomyza" OR "Pinicola" OR "Procarduelis" OR "Pseudonestor" OR "Psittirostra" OR "Pyrrhoplectes" OR "Pyrrhula" OR "Rhodopechys" OR "Rhodospiza" OR "Serinus" OR "Spinus" OR "Telespiza" OR "Anabacerthia" OR "Anabazenops" OR "Ancistrops" OR "Anumbius" OR "Aphrastura" OR "Asthenes" OR "Automolus" OR "Berlepschia" OR "Campylorhamphus" OR "Certhiasomus" OR "Certhiopsis" OR "Cinclodes" OR "Clibanornis" OR "Coryphistera" OR "Cranioleuca" OR "Deconychura" OR "Dendrexetastes" OR "Dendrococcyz" OR "Dendrocolaptes" OR "Dendroplex" OR "Drymornis" OR "Drymoxerops" OR "Furnarius" OR "Geothlypis" OR "Geothlypis" OR "Glyphorhynchus" OR "Heliobletus" OR "Hellmayrea" OR "Hylexetastes" OR "Lepidocolaptes" OR "Leptasthenura" OR "Limnoides" OR "Limnornis" OR "Lochmias" OR "Margarornis" OR "Mazaria" OR "Megaxenops" OR "Metopothrix" OR "Microxenops" OR "Nasica" OR "Ochetorhynchus" OR "Phacellodomus" OR "Philydor" OR "Phleocryptes" OR "Premnoplex" OR "Premnornis" OR "Pseudasthenes" OR "Pseudocolaptes" OR "Pseudoseisura" OR "Pygarrhichas" OR "Roraimia" OR "Schoeniophylax" OR "Sclerurus" OR "Sittasomus" OR "Spartonoica" OR "Sylviorhynchus" OR "Synallaxis" OR "Syndactyla" OR "Tarphonotus" OR "Thripadectes" OR "Thripophaga" OR "Upucerthia" OR "Xenerpestes" OR "Xenops" OR "Xiphocolaptes" OR "Xiphorhynchus"

OR "Grallaria" OR "Grallaricula" OR "Hyllopezus" OR "Myrmothera" OR "Alopochelidon" OR "Atticora" OR "Cecropis" OR "Delichon" OR "Haplochelidon" OR "Hirundo" OR "Neochelidon" OR "Notiochelidon" OR "Orochelidon" OR "Petrochelidon" OR "Phedina" OR "Progne" OR "Psolidoprocne" OR "Pseudhirundo" OR "Pseudochelidon" OR "Ptyonoprogne" OR "Riparia" OR "Stelgidopteryx" OR "Tachycineta" OR "Hyltiota" OR "Hypocolius" OR "Agelaioides" OR "Agelaius" OR "Agelasticus" OR "Amblycercus" OR "Amblyramphus" OR "Anumara" OR "Cacicus" OR "Chrysomus" OR "Curaeus" OR "Dives" OR "Dolichonyx" OR "Euphagus" OR "Gnorimopsar" OR "Gymnomystax" OR "Hypopyrrhus" OR "Icterus" OR "Lamprosar" OR "Leistes" OR "Macroagelaius" OR "Molothrus" OR "Nesopsar" OR "Oreopsar" OR "Psarocolius" OR "Pseudoleistes" OR "Quiscalus" OR "Sturnella" OR "Xanthocephalus" OR "Xanthopsar" OR "Icteria" OR "Ifrita" OR "Irena" OR "Corvinella" OR "Eurocephalus" OR "Lanius" OR "Actinodura" OR "Argya" OR "Garrulax" OR "Grammatoptila" OR "Heterophasia" OR "Lanthocincla" OR "Laniellus" OR "Leiothrix" OR "Liocichla" OR "Minla" OR "Pterorhinus" OR "Trochalopecteron" OR "Turdoides" OR "Bradypterus" OR "Cincloramphus" OR "Helopsaltes" OR "Locustella" OR "Megalurus" OR "Poodytes" OR "Machaerirhynchus" OR "Graueria" OR "Hylia" OR "Macrosphenus" OR "Melocichla" OR "Sylvietta" OR "Chlorophoneus" OR "Dryoscopus" OR "Laniarius" OR "Malaconotus" OR "Nilaus" OR "Rhodophoneus" OR "Tchagra" OR "Telophorus" OR "Amytornis" OR "Chenorhamphus" OR "Clytomyias" OR "Malurus" OR "Stipiturus" OR "Melampitta" OR "Melanocharis" OR "Oedistoma" OR "Toxorhamphus" OR "Melanopareia" OR "Acanthagenys" OR "Acanthorhynchus" OR "Anthochaera" OR "Anthornis" OR "Caligavis" OR "Entomyzon" OR "Epthianura" OR "Glycifolia" OR "Gymnomyza" OR "Lichmera" OR "Manorina" OR "Melidectes" OR "Melilestes" OR "Meliphaga" OR "Melipotes" OR "Melithreptus" OR "Myzomela" OR "Nesoptilotis" OR "Philemon" OR "Phylidonyris" OR "Prothemadera" OR "Ptiloprora" OR "Ptilotula" OR "Pycnopygius" OR "Timeliopsis" OR "Xanthotis" OR "Menura" OR "Allenia" OR "Cincloerchia" OR "Dumetella" OR "Margarops" OR "Melanoptila" OR "Melanotis" OR "Mimus" OR "Oreoscoptes" OR "Ramphocinclus" OR "Toxostoma" OR "Lamprospiza" OR "Mitrospingus" OR "Moho" OR "Mohoua" OR "Arses" OR "Carterornis" OR "Clytorhynchus" OR "Grallina" OR "Hypothymis" OR "Monarcha" OR "Myiagra" OR "Symposiachrus" OR "Terpsiphone" OR "Trochocercus" OR "Anthus" OR "Macronyx" OR "Motacilla" OR "Alethe" OR "Anthipes" OR "Brachypteryx" OR "Calliope" OR "Carpicoides" OR "Cercotrichas" OR "Chamaetylas" OR "Copsychus" OR "Cossypha" OR "Cyanoptila" OR "Cyornis" OR "Enicurus" OR "Erithacus" OR "Eumyias" OR "Ficedula" OR "Fraseria" OR "Irania" OR "Larvivora" OR "Leonardina" OR "Luscinia" OR "Melaenornis" OR "Monticola" OR "Muscicapa" OR "Myiomela" OR "Myioparus" OR "Myophonus" OR "Myrmecocichla" OR "Niltava" OR "Oenanthe" OR "Phoenicurus" OR "Pogonocichla" OR "Saxicola" OR "Sheppardia" OR "Sholicola" OR "Stiphornis" OR "Tarsiger" OR "Thamnolaea" OR "Vauriella" OR "Aethopyga" OR "Anabathmis" OR "Anthreptes" OR "Arachnothera" OR "Chalcomitra" OR "Cinnyris" OR "Cyanomitra" OR "Deleornis" OR "Hedydipna" OR "Kurochkinogramma" OR "Leptocoma" OR "Nectarinia" OR "Daphoenositta" OR "Nesospingus" OR "Nicator" OR "Notiomystis" OR "Aleadryas" OR "Oriolus" OR "Pitohui" OR "Sphecotheres" OR "Turnagra" OR "Colluricincla" OR "Falcunculus" OR "Melanorectes" OR "Pachycephala" OR "Pseudorectes" OR "Panurus" OR "Cicinnurus" OR "Diphylodes" OR "Manucodia" OR "Paradisaea" OR "Ptiloris" OR "Paramythia" OR "Pardalotus" OR "Baeolophus" OR "Cephalopyrus" OR "Cyanistes" OR "Lophophanes" OR "Machlolophus" OR "Melaniparus" OR "Melanochlora" OR "Pardaliparus" OR "Parus" OR "Periparus" OR "Poecile" OR "Pseudopodoces" OR "Sittiparus" OR "Sylviparus" OR "Basileuterus" OR "Cardellina" OR "Catharopeza" OR "Dendroica" OR "Geothlypis" OR "Helmitheros" OR "Leiothlypis" OR "Limnithlypis" OR "Mniotilta" OR "Myioborus" OR "Myiothlypis" OR "Oporornis" OR "Oreothlypis" OR "Parkesia" OR "Protonotaria" OR "Seiurus" OR "Setophaga" OR "Vermivora" OR "Aimophila" OR "Ammodramus" OR "Amphispiza" OR "Arremon" OR "Arremonops" OR "Artemisospiza" OR "Atlapetes" OR "Calamospiza" OR "Chlorospingus" OR "Chondestes" OR "Junco" OR "Melospiza" OR "Melozone" OR "Oreothraupis" OR "Oriturus" OR "Passerculus" OR "Passerella" OR "Peucaea" OR "Pezopetes" OR "Pipilo" OR "Poecetes" OR "Pselliophorus" OR "Rhynchospiza" OR "Spizella" OR "Spizelloides" OR "Xenospiza" OR "Zonotrichia" OR "Carpodacus" OR "Gymnoris" OR "Hypocryptadius" OR "Montifringilla" OR "Onychostreus" OR "Passer" OR "Petronia" OR "Pyrgilauda" OR "Alcippe" OR "Gampsorhynchus" OR "Illadopsis" OR "Jabouilleia" OR "Kenopia" OR "Laticilla" OR "Malacocincla" OR "Malacopteron" OR "Napothea" OR "Pellorneum" OR "Rimator" OR "Trichastoma" OR "Amalocichla" OR "Drymodes" OR "Eopsaltria" OR "Eugerygone" OR "Heteromyias" OR "Melanodryas" OR "Microeca" OR "Monachella" OR "Pachycephalopsis" OR "Peneoenanthe" OR "Peneothello" OR "Petroica" OR "Poecilodryas" OR "Tregellasia" OR "Peucedramus" OR "Microligea" OR "Phaenicophilus" OR "Xenoligea" OR "Phylloscopus" OR "Picathartes" OR "Antilophia" OR "Ceratopipra" OR "Chiroxiphia" OR "Chloropipo" OR "Corapipo" OR "Cryptopipo" OR "Heterocercus" OR "Illicura" OR "Lepidothrix" OR "Machaeropterus" OR "Manacus" OR "Masius" OR "Neopelma" OR "Pipra" OR "Pseudopipra" OR "Tyrannetes" OR "Xenopipo" OR "Erythropitta" OR "Hydrornis" OR "Pitta" OR "Batis" OR "Platysteira" OR "Anaplectes" OR "Bubalornis" OR "Euplectes" OR "Malimbus" OR "Plocepasser" OR "Ploceus" OR "Quelea" OR "Sporopipes" OR "Pnoepyga" OR "Microbates" OR "Polioptila" OR

"Ramphocaenus" OR "Garritornis" OR "Prunella" OR "Cinclosoma" OR "Ptilorrhoa" OR "Phainopepla" OR "Phainoptila" OR "Ptiliogonys" OR "Ailuroedus" OR "Amblyornis" OR "Ptilonorhynchus" OR "Sericulus" OR "Alophoixus" OR "Andropadus" OR "Arizelocichla" OR "Atimastillas" OR "Baeopogon" OR "Bleda" OR "Chlorocichla" OR "Criniger" OR "Eurillas" OR "Hemixos" OR "Hypsipetes" OR "Iole" OR "Ixos" OR "Neolestes" OR "Phyllastrephus" OR "Pycnonotus" OR "Spizixos" OR "Stelgidillas" OR "Tricholestes" OR "Regulus" OR "Anthoscopus" OR "Auriparus" OR "Remiz" OR "Rhagologus" OR "Eleoscytalopus" OR "Liosceles" OR "Psilorhamphus" OR "Pterotochos" OR "Scelorchilus" OR "Scytalopus" OR "Teledromas" OR "Rhipidura" OR "Rhodinocichla" OR "Sapayoa" OR "Sitta" OR "Spindalis" OR "Chelidorrhynx" OR "Culicicapa" OR "Elminia" OR "Acridotheres" OR "Agropsar" OR "Ampeliceps" OR "Aplonis" OR "Basilonis" OR "Cinnyricinclus" OR "Creatophora" OR "Gracula" OR "Gracupica" OR "Hartlaubius" OR "Hylopsar" OR "Lamprotonis" OR "Leucopsar" OR "Mino" OR "Notopholia" OR "Onychognathus" OR "Pastor" OR "Poeoptera" OR "Rhabdornis" OR "Sarcops" OR "Scissirostrum" OR "Speculipastor" OR "Spodiopsar" OR "Streptocitta" OR "Sturnia" OR "Sturnus" OR "Chamaea" OR "Chleuasicus" OR "Chloropeta" OR "Chrysomma" OR "Conostoma" OR "Fulvetta" OR "Lioparus" OR "Paradoxornis" OR "Pseudoalcippe" OR "Psittiparus" OR "Rhopophilus" OR "Sinosuthora" OR "Suthora" OR "Sylvia" OR "Teretistris" OR "Akletos" OR "Ampelornis" OR "Aprositoris" OR "Batara" OR "Cercomacra" OR "Cercomacroides" OR "Cymbilaimus" OR "Dichrozona" OR "Drymophila" OR "Dysithamnus" OR "Epinecrophylla" OR "Euchrepomis" OR "Formicivora" OR "Frederickena" OR "Gymnocichla" OR "Gymnophithys" OR "Hafferia" OR "Herpsilochmus" OR "Hylophylax" OR "Hypocnemis" OR "Hypocnemoides" OR "Hypoedaleus" OR "Isleria" OR "Mackenziaena" OR "Megastictus" OR "Microrhopias" OR "Myrmeciza" OR "Myrmelastes" OR "Myrmoborus" OR "Myrmochanes" OR "Myrmoderus" OR "Myrmophylax" OR "Myrmorchilus" OR "Myrmornis" OR "Myrmotherula" OR "Neotantes" OR "Oneillornis" OR "Percnostola" OR "Phaenostictus" OR "Phlegopsis" OR "Pithys" OR "Polioecrania" OR "Pygiptila" OR "Pyriglena" OR "Rhegmatorhina" OR "Rhopias" OR "Rhopornis" OR "Sakesphorus" OR "Sciaphylax" OR "Sclateria" OR "Sipia" OR "Taraba" OR "Thamnistes" OR "Thamnomanes" OR "Thamnophilus" OR "Willisornis" OR "Xenornis" OR "Anisognathus" OR "Bangsia" OR "Buthraupis" OR "Calochaetes" OR "Catamblyrhynchus" OR "Catamenia" OR "Charitospiza" OR "Chlorochrysa" OR "Chlorophanes" OR "Chlorornis" OR "Chrysothlypis" OR "Cissopis" OR "Cnemoscopus" OR "Coereba" OR "Compsospiza" OR "Compsothraupis" OR "Conirostrum" OR "Conothraupis" OR "Coryphospingus" OR "Creurgops" OR "Cyanerpes" OR "Cyanicterus" OR "Cypsnagra" OR "Dacnis" OR "Delothraupis" OR "Diglossa" OR "Diuca" OR "Dolospingus" OR "Donacospiza" OR "Dubusia" OR "Emberizoides" OR "Embernagra" OR "Eucometis" OR "Euneornis" OR "Geospiza" OR "Gubernatrix" OR "Haplospiza" OR "Hemispingus" OR "Hemithraupis" OR "Heterospingus" OR "Incaspiza" OR "Iridophanes" OR "Iridosornis" OR "Lanio" OR "Lophospingus" OR "Loxigilla" OR "Loxipasser" OR "Melanodera" OR "Melanospiza" OR "Melopyrrha" OR "Nemosia" OR "Nephelornis" OR "Oreomanes" OR "Oryzoborus" OR "Parkerthraustes" OR "Paroaria" OR "Phrygilus" OR "Piezorina" OR "Pipraeidea" OR "Poospiza" OR "Pyrrhocomma" OR "Ramphocelus" OR "Rhodospingus" OR "Saltator" OR "Saltatricula" OR "Schistochlamys" OR "Sericosyphus" OR "Sicalis" OR "Sporophila" OR "Stephanophorus" OR "Tachyphonus" OR "Tangara" OR "Tersina" OR "Thlypopsis" OR "Thraupis" OR "Tiaris" OR "Trichothraupis" OR "Volatinia" OR "Wetmorethraupis" OR "Xenodacnis" OR "Xenospingus" OR "Tichodroma" OR "Macronus" OR "Pomatorhinus" OR "Spelaornis" OR "Stachyridopsis" OR "Stachyris" OR "Iodopleura" OR "Laniisoma" OR "Laniocera" OR "Myiobius" OR "Onychorhynchus" OR "Oxyruncus" OR "Pachyrhamphus" OR "Schiffornis" OR "Terenotriccus" OR "Tityra" OR "Xenopsaris" OR "Campylorhynchus" OR "Cantorchilus" OR "Catherpes" OR "Cinnycerthia" OR "Cistothorus" OR "Cyphorhinus" OR "Henicorhina" OR "Microcerculus" OR "Odontorchilus" OR "Pheugopedius" OR "Salpinctes" OR "Thryomanes" OR "Thryophilus" OR "Thryothorus" OR "Troglodytes" OR "Uropsila" OR "Catharus" OR "Cichlopsis" OR "Entomodestes" OR "Geokichla" OR "Hylocichla" OR "Ixoreus" OR "Myadestes" OR "Neocossyphus" OR "Ridgwayia" OR "Sialia" OR "Stizorhina" OR "Turdus" OR "Zoothera" OR "Agriornis" OR "Alectrurus" OR "Anairetes" OR "Aphanotriccus" OR "Arundinicola" OR "Atalotriccus" OR "Attila" OR "Camptostoma" OR "Casiempis" OR "Casiornis" OR "Cnemarchus" OR "Cnemotriccus" OR "Cnipodectes" OR "Colonia" OR "Colorhamphus" OR "Conopias" OR "Contopus" OR "Corythopsis" OR "Culicivora" OR "Deltarhynchus" OR "Elaenia" OR "Empidonax" OR "Empidonomus" OR "Euscarthmus" OR "Fluvicola" OR "Griseotyrannus" OR "Gubernetes" OR "Hemitriccus" OR "Heteroxolmis" OR "Hirundinea" OR "Hymenops" OR "Inezia" OR "Knipolegus" OR "Lathrotriccus" OR "Legatus" OR "Leptopogon" OR "Lessonia" OR "Lophotriccus" OR "Machetornis" OR "Mecocerculus" OR "Megarynchus" OR "Mionectes" OR "Mitrephanes" OR "Muscigralla" OR "Muscisaxicola" OR "Myiarchus" OR "Myiodynastes" OR "Myiopagis" OR "Myiophobus" OR "Myiornis" OR "Myiotheretes" OR "Myiotriccus" OR "Myiozetetes" OR "Neopipo" OR "Neoxolmis" OR "Nephelomyias" OR "Ochthoeca" OR "Ochthornis" OR "Oncostoma" OR "Ornithion" OR "Phaeomyias" OR "Philohydor" OR "Phyllomyias" OR "Phylloscartes" OR "Piprites" OR "Pitangus" OR "Platyrinchus" OR "Poecilotriccus" OR "Pogonotriccus" OR "Polioxolmis" OR "Polystictus" OR "Pseudelaenia" OR "Pseudocolopteryx" OR "Pseudotriccus" OR "Pyrocephalus" OR

"Pyrrophomyias" OR "Ramphotrigon" OR "Rhynchocyclus" OR "Rhytipterna" OR "Satrapa" OR "Sayornis" OR "Serpophaga" OR "Silvicultrix" OR "Sirystes" OR "Stigmatura" OR "Sublegatus" OR "Suiriri" OR "Tachuris" OR "Taeniotriccus" OR "Todiostrostrum" OR "Tolmomyias" OR "Tumbezia" OR "Tyrannopsis" OR "Tyrannulus" OR "Tyrannus" OR "Uromyias" OR "Xenotriccus" OR "Xolmis" OR "Zimmerius" OR "Urocynchramus" OR "Artamella" OR "Calicalicus" OR "Cyanolanius" OR "Euryceros" OR "Falculea" OR "Hypositta" OR "Leptopterus" OR "Mystacornis" OR "Newtonia" OR "Oriolia" OR "Philentoma" OR "Prionops" OR "Pseudobias" OR "Schetba" OR "Tephrodornis" OR "Tylas" OR "Vanga" OR "Xenopirostris" OR "Anomalospiza" OR "Vidua" OR "Cyclarhis" OR "Erpornis" OR "Hylophilus" OR "Pteruthius" OR "Vireo" OR "Vireolanius" OR "Zeledonia" OR "Apalopteron" OR "Dasycrotapha" OR "Heleia" OR "Lophozosterops" OR "Sternhoptilus" OR "Yuhina" OR "Zosterops" OR "Zosterornis" OR "Agamia" OR "Ardea" OR "Ardeola" OR "Botaurus" OR "Bubulcus" OR "Butorides" OR "Cochlearius" OR "Dupetor" OR "Egretta" OR "Gorsachius" OR "Ixobrychus" OR "Nyctanassa" OR "Nycticorax" OR "Pilherodius" OR "Syigma" OR "Tigriornis" OR "Tigrisoma" OR "Zebulus" OR "Balaeniceps" OR "Pelecanus" OR "Scopus" OR "Bostrychia" OR "Eudocimus" OR "Geronticus" OR "Lophotibis" OR "Mesembrinibis" OR "Nipponia" OR "Phimosus" OR "Platalea" OR "Plegadis" OR "Pseudibis" OR "Theristicus" OR "Threskiornis" OR "Phaethon" OR "Phoeniconaias" OR "Phoenicoparrus" OR "Phoenicopterus" OR "Bucco" OR "Chelidoptera" OR "Hapaloptila" OR "Hypnelus" OR "Malacoptila" OR "Micromonacha" OR "Monasa" OR "Nonnula" OR "Notharchus" OR "Nystalus" OR "Capito" OR "Eubucco" OR "Brachygalba" OR "Galbalcyrhynchus" OR "Galbula" OR "Jacamaralcyon" OR "Jacamerops" OR "Indicator" OR "Melichneutes" OR "Melignomon" OR "Prodotiscus" OR "Buccanodon" OR "Gymnobucco" OR "Lybius" OR "Pogoniulus" OR "Stactolaema" OR "Trachyphonus" OR "Psilopogon" OR "Blythipicus" OR "Campephilus" OR "Campethera" OR "Celeus" OR "Chloropicus" OR "Chrysocolaptes" OR "Chrysophlegma" OR "Colaptes" OR "Dendrocopos" OR "Dendrocytes" OR "Dendropicos" OR "Dinopium" OR "Dryobates" OR "Dryocopus" OR "Gecinulus" OR "Geocolaptes" OR "Jynx" OR "Leiopicus" OR "Leuconotopicus" OR "Meiglyptes" OR "Melanerpes" OR "Micropternus" OR "Mulleripicus" OR "Nesocittes" OR "Picoides" OR "Piculus" OR "Picumnus" OR "Picus" OR "Reinwardtipicus" OR "Sasia" OR "Sphyrapicus" OR "Veniliornis" OR "Yungipicus" OR "Andigena" OR "Aulacorhynchus" OR "Pteroglossus" OR "Ramphastos" OR "Selenidera" OR "Semnornis" OR "Aechmophorus" OR "Podiceps" OR "Podilymbus" OR "Poliocephalus" OR "Rollandia" OR "Tachybaptus" OR "Diomedea" OR "Phoebastria" OR "Phoebetria" OR "Thalassarche" OR "Hydrobates" OR "Oceanodroma" OR "Fregetta" OR "Garrodia" OR "Nesofregetta" OR "Oceanites" OR "Pelagodroma" OR "Aphrodroma" OR "Ardenna" OR "Bulweria" OR "Calonectris" OR "Daption" OR "Fulmarus" OR "Halobaena" OR "Macronectes" OR "Pachyptila" OR "Pagodroma" OR "Pelecanoides" OR "Procellaria" OR "Pseudobulweria" OR "Pterodroma" OR "Puffinus" OR "Thalassoica" OR "Cacatua" OR "Callocephalon" OR "Calyptorhynchus" OR "Eolophus" OR "Lophochroa" OR "Nymphicus" OR "Probosciger" OR "Alipiopsitta" OR "Amazona" OR "Anodorhynchus" OR "Ara" OR "Aratinga" OR "Bolborhynchus" OR "Brotogeris" OR "Conuropsis" OR "Cyanoliseus" OR "Cyanopsitta" OR "Deroptilus" OR "Diopsittaca" OR "Enicognathus" OR "Eupsittula" OR "Forpus" OR "Graydidascalus" OR "Guarouba" OR "Guaruba" OR "Hapalopsittaca" OR "Leptosittaca" OR "Myiopsitta" OR "Nannopsittaca" OR "Orthopsittaca" OR "Pionites" OR "Pionopsitta" OR "Pionus" OR "Poicephalus" OR "Primolius" OR "Psilopsiagon" OR "Psittacara" OR "Psittacus" OR "Pyrrhula" OR "Pyrrhura" OR "Rhynchopsitta" OR "Thectocercus" OR "Touit" OR "Triclaria" OR "Agapornis" OR "Alisterus" OR "Aprosmictus" OR "Barnardius" OR "Bolbopsittacus" OR "Chalcopsitta" OR "Charmosyna" OR "Coracopsis" OR "Cyanoramphus" OR "Cyclopsitta" OR "Eclectus" OR "Eos" OR "Eunymphicus" OR "Geoffroyus" OR "Glossopsitta" OR "Lathamus" OR "Loriculus" OR "Lorius" OR "Melopsittacus" OR "Micropsitta" OR "Neophema" OR "Neopsephotus" OR "Neopsittacus" OR "Northiella" OR "Oreopsittacus" OR "Parvipsitta" OR "Pezoporus" OR "Phigys" OR "Platycercus" OR "Polytelis" OR "Prioniturus" OR "Prosopieia" OR "Psephotellus" OR "Psephotus" OR "Pseudeos" OR "Psittacella" OR "Psittacula" OR "Psittaculirostris" OR "Psittuteles" OR "Psittinus" OR "Psittichas" OR "Purpureicephalus" OR "Tanygnathus" OR "Trichoglossus" OR "Vini" OR "Nestor" OR "Strigops" OR "Pterocles" OR "Syrrhaptes" OR "Rhea" OR "Aptenodytes" OR "Eudiptes" OR "Eudiptula" OR "Megadyptes" OR "Pygoscelis" OR "Spheniscus" OR "Aegolius" OR "Asio" OR "Athene" OR "Bubo" OR "Glaucidium" OR "Ketupa" OR "Lophotrix" OR "Megascops" OR "Micrathene" OR "Ninox" OR "Otus" OR "Pseudoscops" OR "Psiloscops" OR "Pulsatrix" OR "Sceloglaux" OR "Scotopelia" OR "Strix" OR "Surnia" OR "Xenoglaux" OR "Phodilus" OR "Tyto" OR "Aepyornis" OR "Mullerornis" OR "Struthio" OR "Anhinga" OR "Fregata" OR "Leucocarbo" OR "Microcarbo" OR "Nannopterum" OR "Phalacrocorax" OR "Morus" OR "Sula" OR "Crypturellus" OR "Eudromia" OR "Nothocercus" OR "Nothoprocta" OR "Nothura" OR "Rhynchotus" OR "Tinamotis" OR "Tinamus" OR "Apalharpactes" OR "Apaloderma" OR "Harpactes" OR "Pharomachrus" OR "Trogon" OR "Tetrastes" OR "Hesperiphona") AND ("reproductive success" OR "growth" OR "mating success" OR "recruitment" OR "fertility" OR "mortality" OR "longevity" OR "body condition" OR "condition" OR "body size" OR "survival" OR "clutch size" OR "breeding success" OR "recruit*" OR "eggs laid" OR "number of eggs" OR "fitness" OR "fledgling*" OR "hatching success" OR "development") AND ("anthropogenic noise" OR "traffic

noise" OR "ambient noise" OR "urban noise" OR "noise pollution")) OR AB=(("songbird*" OR "passerine*" OR "bird*" OR "aves" OR "avian" OR "ornithol*" OR "passeriform*" OR "Accipiter" OR "Aegypius" OR "Aquila" OR "Aviceda" OR "Busarellus" OR "Butastur" OR "Buteo" OR "Buteogallus" OR "Chondrohierax" OR "Circaetus" OR "Circus" OR "Clanga" OR "Elanoides" OR "Elanus" OR "Gampsonyx" OR "Geranoaetus" OR "Geranospiza" OR "Gypaetus" OR "Gypohierax" OR "Gyps" OR "Haliaeetus" OR "Haliastur" OR "Harpagus" OR "Harpia" OR "Hieraaetus" OR "Ictinaetus" OR "Ictinia" OR "Kaupifalco" OR "Leptodon" OR "Leucopternis" OR "Lophotriorchis" OR "Milvus" OR "Morphnarchus" OR "Morphnus" OR "Necrosyrtes" OR "Neophron" OR "Nisaetus" OR "Parabuteo" OR "Pernis" OR "Pithecopaga" OR "Polemaetus" OR "Pseudastur" OR "Rostrhamus" OR "Rupornis" OR "Sarcogyps" OR "Spilornis" OR "Spizaetus" OR "Stephanoaetus" OR "Terathopus" OR "Torgos" OR "Trigonoceps" OR "Cathartes" OR "Coragyps" OR "Gymnogyps" OR "Sarcoramphus" OR "Vultur" OR "Pandion" OR "Sagittarius" OR "Aix" OR "Alopochen" OR "Amazonetta" OR "Anas" OR "Anser" OR "Asarcornis" OR "Aythya" OR "Branta" OR "Bucephala" OR "Cairina" OR "Callonetta" OR "Cereopsis" OR "Chen" OR "Chenonetta" OR "Chloephaga" OR "Clangula" OR "Coscoroba" OR "Cyanochen" OR "Cygnus" OR "Dendrocygna" OR "Heteronetta" OR "Histrionicus" OR "Hymenolaimus" OR "Lophodytes" OR "Lophonetta" OR "Malacorhynchus" OR "Mareca" OR "Marmaronetta" OR "Melanitta" OR "Merganetta" OR "Mergellus" OR "Mergus" OR "Neochen" OR "Netta" OR "Nettapus" OR "Nomonyx" OR "Oxyura" OR "Plectropterus" OR "Polysticta" OR "Pteronetta" OR "Sarkidiornis" OR "Sibirionetta" OR "Somateria" OR "Spatula" OR "Tachyeres" OR "Tadorna" OR "Thalassornis" OR "Anhima" OR "Chauna" OR "Anseranas" OR "Aegothales" OR "Aerodramus" OR "Aeronautes" OR "Apus" OR "Chaetura" OR "Collocalia" OR "Cypseloides" OR "Cypsiurus" OR "Hirundapus" OR "Panyptila" OR "Streptoprocne" OR "Tachornis" OR "Tachymarpis" OR "Hemiprocne" OR "Abeilia" OR "Adelomyia" OR "Aglaeactis" OR "Aglaiocercus" OR "Amazilia" OR "Androdon" OR "Anopetia" OR "Anthocephala" OR "Anthracothorax" OR "Archilochus" OR "Atthis" OR "Augastes" OR "Avocettula" OR "Basilinna" OR "Boissonneaua" OR "Calliphlox" OR "Calypste" OR "Campylopterus" OR "Chaetocercus" OR "Chalcostigma" OR "Chalybura" OR "Chlorestes" OR "Chlorostilbon" OR "Chrysolampis" OR "Chrysurnia" OR "Clytolaema" OR "Coeligena" OR "Colibri" OR "Cyanophaea" OR "Cyanthus" OR "Discosura" OR "Doricha" OR "Doryfera" OR "Elvira" OR "Ensifera" OR "Eriocnemis" OR "Eugenes" OR "Eulampis" OR "Eulidia" OR "Eupetomena" OR "Eupherusa" OR "Eutoxeres" OR "Florisuga" OR "Glaucis" OR "Goethalsia" OR "Goldmania" OR "Haplophadia" OR "Heliactin" OR "Heliangelus" OR "Heliodoxa" OR "Heliomaster" OR "Heliophryx" OR "Hylocharis" OR "Juliamyia" OR "Klais" OR "Lafresnaya" OR "Lampornis" OR "Lamprolaima" OR "Lepidopyga" OR "Lesbia" OR "Leucippus" OR "Leucochloris" OR "Lophornis" OR "Mellisuga" OR "Metallura" OR "Microchera" OR "Myrmia" OR "Myrtis" OR "Ocreatus" OR "Opisthoprora" OR "Oreonympha" OR "Oreotrochilus" OR "Orthorhynchus" OR "Oxygogon" OR "Panterpe" OR "Patagona" OR "Phaeochroa" OR "Phaethornis" OR "Phlogophilus" OR "Polyonymus" OR "Polytmus" OR "Pterophanes" OR "Ramphodon" OR "Ramphomicron" OR "Rhodopsis" OR "Sappho" OR "Schistes" OR "Selasphorus" OR "Sephanoidea" OR "Stephanoxis" OR "Sternoclyta" OR "Taphrosphilus" OR "Thalaurania" OR "Thaumastura" OR "Threnetes" OR "Topaza" OR "Trochilus" OR "Urochroa" OR "Urosticte" OR "Apteryx" OR "Anthracoceros" OR "Buceros" OR "Bycanistes" OR "Lophoceros" OR "Penelopides" OR "Rhabdotorrhinus" OR "Rhyticeros" OR "Tockus" OR "Bucorvus" OR "Phoeniculus" OR "Rhinopomastus" OR "Upupa" OR "Antrostomus" OR "Caprimulgus" OR "Chordeiles" OR "Eleothreptus" OR "Eurostopodus" OR "Hydropsalis" OR "Lurocalis" OR "Lyncornis" OR "Nyctidromus" OR "Nyctiphrynus" OR "Nyctipolus" OR "Nyctiprogne" OR "Phalaenoptilus" OR "Setopagis" OR "Systellura" OR "Uropsalis" OR "Nyctibius" OR "Batrachostomus" OR "Podargus" OR "Steatornis" OR "Cariama" OR "Casuarii" OR "Dromaius" OR "Aethia" OR "Alca" OR "Alle" OR "Brachyramphus" OR "Cephus" OR "Ceryle" OR "Fratricula" OR "Pinguinus" OR "Ptychoramphus" OR "Synthliboramphus" OR "Uria" OR "Burhinus" OR "Anarhynchus" OR "Charadrius" OR "Euseiornis" OR "Erythrogonys" OR "Hoploxypterus" OR "Oreopholus" OR "Peltodytes" OR "Phegornis" OR "Pluvialis" OR "Thinornis" OR "Vanellus" OR "Chionis" OR "Dromas" OR "Cursorius" OR "Glareola" OR "Rhinoptilus" OR "Stiltia" OR "Haematopus" OR "Actophilornis" OR "Hydrophasianus" OR "Irediparra" OR "Jacana" OR "Metopidius" OR "Microparra" OR "Anous" OR "Chlidonias" OR "Chroicocephalus" OR "Creagrus" OR "Gelochelidon" OR "Gygis" OR "Hydrocoloeus" OR "Hydroprogne" OR "Ichthyophaga" OR "Larosterna" OR "Larus" OR "Leucophaea" OR "Onychoprion" OR "Pagophila" OR "Phaethon" OR "Rhodostethia" OR "Rissa" OR "Rynchops" OR "Sterna" OR "Sternula" OR "Thalasseus" OR "Xema" OR "Pedionomus" OR "Pluvianellus" OR "Pluvianus" OR "Himantopus" OR "Recurvirostra" OR "Nycticorax" OR "Rostratula" OR "Actitis" OR "Arenaria" OR "Bartramia" OR "Calidris" OR "Coenocorypha" OR "Gallinago" OR "Limnodromus" OR "Limosa" OR "Lymnocyttus" OR "Numenius" OR "Phalaropus" OR "Scolopax" OR "Tringa" OR "Xenus" OR "Stereocorys" OR "Attagus" OR "Thinocorus" OR "Turnix" OR "Ciconia" OR "Ephippiorhynchus" OR "Jabiru" OR "Leptoptilos" OR "Mycteria" OR "Colius" OR "Urocolius" OR "Alectroenas" OR "Alopecoenas" OR "Caloenas" OR "Chalcophaps" OR "Claravis" OR "Columba" OR "Columbina" OR "Didunculus" OR "Drepanoptila" OR "Ducula" OR "Ectopistes" OR "Gallicolumba" OR "Geopelia" OR "Geophaps" OR "Geotrygon" OR "Goura" OR "Gymnophaps" OR "Hemiphaea" OR

"Henicophaps" OR "Leptotila" OR "Leptotrygon" OR "Leucosarcia" OR "Lopholaimus" OR "Macropygia" OR "Metriopelia" OR "Ocyphaps" OR "Oena" OR "Otidiphaps" OR "Patagioenas" OR "Petrophassa" OR "Pezophaps" OR "Phapitreron" OR "Phaps" OR "Ptilinopus" OR "Raphus" OR "Reinwardtoena" OR "Spilopelia" OR "Streptopelia" OR "Treron" OR "Trugon" OR "Turacoena" OR "Turtur" OR "Uropelia" OR "Zenaida" OR "Zentrygon" OR "Actenoides" OR "Alcedo" OR "Caridonax" OR "Ceryle" OR "Ceyx" OR "Chloroceryle" OR "Cittura" OR "Corythornis" OR "Dacelo" OR "Halcyon" OR "Ispidina" OR "Lacedo" OR "Megaceryle" OR "Melidora" OR "Syma" OR "Tanyptera" OR "Todiramphus" OR "Atelornis" OR "Brachypteracias" OR "Geobiastes" OR "Coracias" OR "Eurystomus" OR "Merops" OR "Nyctornis" OR "Baryphthengus" OR "Electron" OR "Eumomota" OR "Hylomanes" OR "Momotus" OR "Todus" OR "Cacomantis" OR "Carpococcyx" OR "Centropus" OR "Cercococcyx" OR "Chrysococcyx" OR "Clamator" OR "Coccyzua" OR "Coccyzus" OR "Coua" OR "Crotophaga" OR "Cuculus" OR "Dasylophus" OR "Dromococcyx" OR "Eudynamys" OR "Geococcyx" OR "Guira" OR "Hierococcyx" OR "Morococcyx" OR "Neomorphus" OR "Pachycoccyx" OR "Phaenicophaeus" OR "Piaya" OR "Rhinortha" OR "Scythrops" OR "Surniculus" OR "Tapera" OR "Urodynamis" OR "Zanclostomus" OR "Dinornis" OR "Anomalopteryx" OR "Emeus" OR "Eurypteryx" OR "Eurypyga" OR "Rhynchoceros" OR "Caracara" OR "Daptrius" OR "Falco" OR "Herpetotheres" OR "Ibycter" OR "Micrastur" OR "Microhierax" OR "Milvago" OR "Phalacrocorax" OR "Polihierax" OR "Spizapteryx" OR "Aburria" OR "Chamaepetes" OR "Crax" OR "Mitu" OR "Nothocrax" OR "Oreophaps" OR "Ortalis" OR "Pauxi" OR "Penelope" OR "Penelopina" OR "Pipile" OR "Alectura" OR "Megapodius" OR "Acryllium" OR "Guttera" OR "Numida" OR "Callipepla" OR "Colinus" OR "Cyrtornyx" OR "Dendrortyx" OR "Odontophorus" OR "Oreortyx" OR "Philortyx" OR "Ptilopachus" OR "Rhynchortyx" OR "Alectoris" OR "Ammoperdix" OR "Arborophila" OR "Argusianus" OR "Bambusicola" OR "Bonasa" OR "Caloperdix" OR "Centrocerus" OR "Chrysolophus" OR "Coturnix" OR "Crossoptilon" OR "Dendragapus" OR "Excalfactoria" OR "Falcipennis" OR "Francolinus" OR "Gallus" OR "Haematortyx" OR "Ithaginis" OR "Lagopus" OR "Lerwa" OR "Lophophorus" OR "Lophura" OR "Lyrurus" OR "Meleagris" OR "Pavo" OR "Peliperdix" OR "Perdix" OR "Phasianus" OR "Polyplectron" OR "Pternistis" OR "Pucrasia" OR "Rhizothera" OR "Rollulus" OR "Scleroptila" OR "Syrmaticus" OR "Tetrao" OR "Tetraogallus" OR "Tetraophasis" OR "Tragopan" OR "Tympanuchus" OR "Gavia" OR "Aramus" OR "Anthropoides" OR "Antigone" OR "Balearica" OR "Bucconas" OR "Grus" OR "Leucogeranus" OR "Heliornis" OR "Psophia" OR "Aenigmatolimnas" OR "Amaurolimnas" OR "Amauornis" OR "Anurolimnas" OR "Aramides" OR "Atlantisia" OR "Coturnicops" OR "Crex" OR "Dryolimnas" OR "Eulabeornis" OR "Fulica" OR "Gallinulex" OR "Gallinula" OR "Gallirallus" OR "Laterallus" OR "Lewinia" OR "Micropygia" OR "Neocrex" OR "Nesoclopeus" OR "Paragallinula" OR "Pardirallus" OR "Porphyrio" OR "Porphyriops" OR "Porzana" OR "Rallacula" OR "Rallina" OR "Rallus" OR "Tribonyx" OR "Canirallus" OR "Sarothura" OR "Leptosomus" OR "Corythaëola" OR "Corythaixoides" OR "Crinifer" OR "Musophaga" OR "Tauraco" OR "Opisthocomus" OR "Afrotis" OR "Ardeotis" OR "Chlamydotis" OR "Neotis" OR "Otis" OR "Tetrax" OR "Acanthisitta" OR "Pachyplichas" OR "Traversia" OR "Xenicus" OR "Acanthiza" OR "Acanthornis" OR "Aethomyias" OR "Aphelocephala" OR "Calamanthus" OR "Gerygone" OR "Hylacola" OR "Neosericornis" OR "Oreoscopus" OR "Origma" OR "Pachycare" OR "Pycnophilus" OR "Pyrrholaemus" OR "Sericornis" OR "Smicronis" OR "Acrocephalus" OR "Arundinax" OR "Calamonastides" OR "Hippolais" OR "Iduna" OR "Nesillas" OR "Aegithalos" OR "Leptopoecile" OR "Psaltiriparus" OR "Aegithina" OR "Alaemon" OR "Alauda" OR "Alaudala" OR "Ammomanes" OR "Calandrella" OR "Calendulauda" OR "Chersomanes" OR "Eremophila" OR "Eremopterix" OR "Galerida" OR "Lullula" OR "Melanocorypha" OR "Mirafr" OR "Pinarocorys" OR "Spizocorys" OR "Artamus" OR "Gymnorhina" OR "Melloria" OR "Bombycilla" OR "Buphagus" OR "Calcarius" OR "Plectrophenax" OR "Rhynchophanes" OR "Callaeas" OR "Heteralocha" OR "Philesturnus" OR "Calyptrornis" OR "Campephaga" OR "Cephalopyris" OR "Coracina" OR "Edolisoma" OR "Lalage" OR "Malindangia" OR "Pericrocotus" OR "Amaurospiza" OR "Cardinalis" OR "Caryothraustes" OR "Chlorothraupis" OR "Cyanococcyz" OR "Cyanoloxia" OR "Granatellus" OR "Habia" OR "Passerina" OR "Periporphyrus" OR "Pheucticus" OR "Piranga" OR "Spiza" OR "Certhia" OR "Salpornis" OR "Abroscopus" OR "Cettia" OR "Horornis" OR "Phyllergates" OR "Tesia" OR "Urosphena" OR "Chloropsis" OR "Cinclus" OR "Apalis" OR "Artisornis" OR "Camaroptera" OR "Cisticola" OR "Eremomela" OR "Heliolais" OR "Hypergerus" OR "Neomixis" OR "Oreolais" OR "Orthotomus" OR "Phragmacia" OR "Poliolais" OR "Prinia" OR "Schistolais" OR "Urolais" OR "Urorhipis" OR "Climacteris" OR "Cormobates" OR "Conopophaga" OR "Struthidea" OR "Aphelocoma" OR "Calocitta" OR "Cissa" OR "Coloeus" OR "Corvus" OR "Cyanocitta" OR "Cyanocorax" OR "Cyanolyca" OR "Cyanopica" OR "Dendrocitta" OR "Garrulus" OR "Gymnorhinus" OR "Nucifraga" OR "Perisoreus" OR "Pica" OR "Platylophus" OR "Podoces" OR "Psilorhinus" OR "Ptilostomus" OR "Pyrrhocorax" OR "Urocissa" OR "Ampelioides" OR "Ampelion" OR "Carpornis" OR "Cephalopterus" OR "Conioptilon" OR "Cotinga" OR "Doliornis" OR "Gymnoderus" OR "Haematoderus" OR "Lipaugus" OR "Perissocephalus" OR "Phoenicircus" OR "Phytotoma" OR "Pipreola" OR "Porphyrolaema" OR "Procnias" OR "Pyroderus" OR "Querula" OR "Rupicola" OR "Snowornis" OR "Xipholena" OR "Zaratornis" OR "Dasyornis" OR "Dicaeum" OR

"Prionochilus" OR "Dicrurus" OR "Donacobius" OR "Dulus" OR "Emberiza" OR "Amadina" OR "Amandava" OR "Cryptospiza" OR "Erythrura" OR "Estrilda" OR "Euodice" OR "Euschistospiza" OR "Lagonosticta" OR "Lonchura" OR "Mandingoa" OR "Neochmia" OR "Nesocharis" OR "Nigrita" OR "Ortygospiza" OR "Parmoptila" OR "Pyrenestes" OR "Pytilia" OR "Spermophaga" OR "Stagonopleura" OR "Taeniopygia" OR "Uraeginthus" OR "Calyptomena" OR "Cymbirhynchus" OR "Eurylaimus" OR "Psarisomus" OR "Serilophus" OR "Smithornis" OR "Chamaeza" OR "Formicarius" OR "Acanthis" OR "Agraphospiza" OR "Akialoa" OR "Bucanetes" OR "Carduelis" OR "Carpodacus" OR "Chloris" OR "Chlorodrepanis" OR "Chlorophonia" OR "Chrysocorythus" OR "Coccothraustes" OR "Crithagra" OR "Drepanis" OR "Eophona" OR "Euphonia" OR "Fringilla" OR "Haemorhous" OR "Hemignathus" OR "Himatione" OR "Leucosticte" OR "Linaria" OR "Linurgus" OR "Loxia" OR "Loxioides" OR "Loxops" OR "Magnumma" OR "Melamprosops" OR "Oreomystis" OR "Paroreomyza" OR "Pinicola" OR "Procarduelis" OR "Pseudonestor" OR "Psittirostra" OR "Pyrrhoptes" OR "Pyrrhula" OR "Rhodopechys" OR "Rhodospiza" OR "Serinus" OR "Spinus" OR "Telespiza" OR "Anabacerthia" OR "Anabazenops" OR "Ancistrops" OR "Anumbius" OR "Aphrastura" OR "Asthenes" OR "Automolus" OR "Berlepschia" OR "Campylorhamphus" OR "Certhiasomus" OR "Certhiaxis" OR "Cinclodes" OR "Clibanornis" OR "Coryphistera" OR "Cranioleuca" OR "Deconychura" OR "Dendrexetastes" OR "Dendrocincla" OR "Dendrocolaptes" OR "Dendroplex" OR "Drymornis" OR "Drymoxerops" OR "Furnarius" OR "Geococcyx" OR "Geositta" OR "Glyphorhynchus" OR "Heliobletus" OR "Hellmayrea" OR "Hylexetastes" OR "Lepidocolaptes" OR "Leptasthenura" OR "Limnortyx" OR "Limnornis" OR "Lochmias" OR "Margarornis" OR "Mazaria" OR "Megascops" OR "Metopothrix" OR "Microxenus" OR "Nasica" OR "Ochetorhynchus" OR "Phacellodomus" OR "Philydor" OR "Phleocryptes" OR "Premnoplex" OR "Premnornis" OR "Pseudasthenes" OR "Pseudocolaptes" OR "Pseudoseisura" OR "Pygarrhichas" OR "Roraimia" OR "Schoeniophylax" OR "Sclerurus" OR "Sittasomus" OR "Spartonoica" OR "Sylviorhynchus" OR "Synallaxis" OR "Syndactyla" OR "Tarphonotus" OR "Thripadectes" OR "Thripophaga" OR "Upucerthia" OR "Xenerpestes" OR "Xenops" OR "Xiphocolaptes" OR "Xiphorhynchus" OR "Grallaria" OR "Grallaricula" OR "Hylopezus" OR "Myrmothera" OR "Alopocheilidon" OR "Atticora" OR "Cecropis" OR "Delichon" OR "Haplochelidon" OR "Hirundo" OR "Neochelidon" OR "Notiochelidon" OR "Orochelidon" OR "Petrochelidon" OR "Phedina" OR "Progne" OR "Psittodoprocne" OR "Pseudhirundo" OR "Pseudochelidon" OR "Pyonoprogne" OR "Riparia" OR "Stelgidopteryx" OR "Tachycineta" OR "Hylia" OR "Hypocolius" OR "Agelaioides" OR "Agelaius" OR "Agelastichus" OR "Amblycercus" OR "Amblyramphus" OR "Anumara" OR "Cacicus" OR "Chrysomus" OR "Curaeus" OR "Dives" OR "Dolichonyx" OR "Euphagus" OR "Gnorimopsar" OR "Gymnomystax" OR "Hypopyrrhus" OR "Icterus" OR "Lamprospiza" OR "Leistes" OR "Macroagelaius" OR "Molothrus" OR "Nesopsar" OR "Oreopsar" OR "Psarocolius" OR "Pseudoleistes" OR "Quiscalus" OR "Sturnella" OR "Xanthocephalus" OR "Xanthopsar" OR "Icteria" OR "Ifrita" OR "Irena" OR "Corvinella" OR "Eurocephalus" OR "Lanius" OR "Actinodura" OR "Argya" OR "Garrulax" OR "Grammatoptila" OR "Heterophasia" OR "Lanthocincla" OR "Laniellus" OR "Leiothrix" OR "Liochla" OR "Minla" OR "Pterorhinus" OR "Trochaloxyron" OR "Turdoides" OR "Bradypterus" OR "Cincloramphus" OR "Helopsaltes" OR "Locustella" OR "Megalurus" OR "Poodytes" OR "Machaerirhynchus" OR "Graueria" OR "Hylia" OR "Macrosphenus" OR "Melocichla" OR "Sylvietta" OR "Chlorophoneus" OR "Dryoscopus" OR "Laniarius" OR "Malaconotus" OR "Nilaus" OR "Rhodophoneus" OR "Tchagra" OR "Telophorus" OR "Amytornis" OR "Chenorhamphus" OR "Clytomyias" OR "Malurus" OR "Stipiturus" OR "Melampitta" OR "Melanocharis" OR "Oedistoma" OR "Toxorhamphus" OR "Melanopareia" OR "Acanthagenys" OR "Acanthorhynchus" OR "Anthochaera" OR "Anthornis" OR "Caligavis" OR "Entomozon" OR "Ephianura" OR "Glyciphila" OR "Gymnomyza" OR "Lichmera" OR "Manorina" OR "Melidectes" OR "Melilestes" OR "Meliphaga" OR "Melipotes" OR "Melithreptus" OR "Myzomela" OR "Nesoptilotis" OR "Philemon" OR "Phylidonyris" OR "Prothemadera" OR "Ptiloprora" OR "Ptilotula" OR "Pycnopygius" OR "Timeliopsis" OR "Xanthotis" OR "Menura" OR "Allenia" OR "Cincloerthia" OR "Dumetella" OR "Margarops" OR "Melanoptila" OR "Melanotis" OR "Mimus" OR "Oreoscoptes" OR "Rampocinclus" OR "Toxostoma" OR "Lamprospiza" OR "Mitrospingus" OR "Moho" OR "Mohoua" OR "Arses" OR "Carterornis" OR "Clytorhynchus" OR "Grallina" OR "Hypothymis" OR "Monarcha" OR "Myiagra" OR "Symposiachrus" OR "Terpsiphone" OR "Trochocercus" OR "Anthus" OR "Macronyx" OR "Motacilla" OR "Alethe" OR "Anthipes" OR "Brachypteryx" OR "Calliope" OR "Campicoloides" OR "Cercotrichas" OR "Chamaetylas" OR "Copsychus" OR "Cossypha" OR "Cyanoptila" OR "Cyornis" OR "Enicurus" OR "Erithacus" OR "Eumyias" OR "Ficedula" OR "Fraseria" OR "Irania" OR "Larvivora" OR "Leonardina" OR "Luscinia" OR "Melaenornis" OR "Monticola" OR "Muscicapa" OR "Myiomela" OR "Myioparus" OR "Myophonus" OR "Myrmecocichla" OR "Niltava" OR "Oenanthe" OR "Phoenicurus" OR "Pogonocichla" OR "Saxicola" OR "Sheppardia" OR "Sholicola" OR "Stiphornis" OR "Tarsiger" OR "Thamnolaea" OR "Vauriella" OR "Aethopyga" OR "Anabathmis" OR "Anthreptes" OR "Arachnothera" OR "Chalcomitra" OR "Cinnyris" OR "Cyanomitra" OR "Deleornis" OR "Hedydipna" OR "Kurochkinogramma" OR "Leptocoma" OR "Nectarinia" OR "Daphoenositta" OR "Nesospingus" OR "Nicator" OR "Notiomystis" OR "Aleadryas" OR "Oriolus" OR "Pitohui" OR "Sphecotheres" OR "Turnagra" OR

"Colluricincla" OR "Falcunculus" OR "Melanorectes" OR "Pachycephala" OR "Pseudorectes" OR "Panurus" OR "Cicinnurus" OR "Diphyllodes" OR "Manucodia" OR "Paradisaea" OR "Ptiloris" OR "Paramythia" OR "Pardalotus" OR "Baeolophus" OR "Cephalopyrus" OR "Cyanistes" OR "Lophophanes" OR "Machlolophus" OR "Melaniparus" OR "Melanochlora" OR "Pardaliparus" OR "Parus" OR "Periparus" OR "Poecile" OR "Pseudopodoces" OR "Sittiparus" OR "Sylviparus" OR "Basileuterus" OR "Cardellina" OR "Catharopeza" OR "Dendroica" OR "Geothlypis" OR "Helmitheros" OR "Leiothlypis" OR "Limnithlypis" OR "Mniotilta" OR "Myioborus" OR "Myiothlypis" OR "Oporornis" OR "Oreothlypis" OR "Parkesia" OR "Protonotaria" OR "Seiurus" OR "Setophaga" OR "Vermivora" OR "Aimophila" OR "Ammodramus" OR "Amphispiza" OR "Arremon" OR "Arremonops" OR "Artemisiospiza" OR "Atlapetes" OR "Calamospiza" OR "Chlorospingus" OR "Chondestes" OR "Junco" OR "Melospiza" OR "Melozone" OR "Oreothraupis" OR "Oriturus" OR "Passerculus" OR "Passerella" OR "Peucaea" OR "Pezopetes" OR "Pipilo" OR "Poocetes" OR "Pselliophorus" OR "Rhynchospiza" OR "Spizella" OR "Spizelloides" OR "Xenospiza" OR "Zonotrichia" OR "Carpospiza" OR "Gymnoris" OR "Hypocryptadius" OR "Montifringilla" OR "Onychostruthus" OR "Passer" OR "Petronia" OR "Pyrgilauda" OR "Alcippe" OR "Gampsorhynchus" OR "Illadopsis" OR "Jabouilleia" OR "Kenopia" OR "Laticilla" OR "Malacocincla" OR "Malacopteron" OR "Napothera" OR "Pellorneum" OR "Rimtor" OR "Trichastoma" OR "Amalocichla" OR "Drymodes" OR "Eopsaltria" OR "Eugerygone" OR "Heteromyias" OR "Melanodryas" OR "Microeca" OR "Monachella" OR "Pachycephalopsis" OR "Peneoenanthe" OR "Peneothello" OR "Petroica" OR "Poecilodryas" OR "Tregellasia" OR "Peucedramus" OR "Microligea" OR "Phaenicophilus" OR "Xenoligea" OR "Phylloscopus" OR "Picathartes" OR "Antilophia" OR "Ceratopipra" OR "Chiroxiphia" OR "Chloropipo" OR "Corapipo" OR "Cryptopipo" OR "Heterocercus" OR "Illicura" OR "Lepidothrix" OR "Machaeropterus" OR "Manacus" OR "Masius" OR "Neopelma" OR "Pipra" OR "Pseudopipra" OR "Tyranneutes" OR "Xenopipo" OR "Erythropitta" OR "Hydornis" OR "Pitta" OR "Batis" OR "Platysteira" OR "Anaplectes" OR "Bubalornis" OR "Euplectes" OR "Malimbus" OR "Plocepasser" OR "Ploceus" OR "Quelea" OR "Sporopipes" OR "Pnoepyga" OR "Microbates" OR "Poliopitila" OR "Ramphocaenus" OR "Garritornis" OR "Prunella" OR "Cinclosoma" OR "Ptilorrhoa" OR "Phainopepla" OR "Phainoptila" OR "Ptiliogonys" OR "Ailuroedus" OR "Amblyornis" OR "Ptilonorhynchus" OR "Sericulus" OR "Alophoixus" OR "Andropadus" OR "Arizelocichla" OR "Atimastillas" OR "Baeopogon" OR "Bleda" OR "Chlorocichla" OR "Criniger" OR "Eurillas" OR "Hemixos" OR "Hypsipetes" OR "Iole" OR "Ixos" OR "Neolestes" OR "Phyllastrephus" OR "Pycnonotus" OR "Spizixos" OR "Stelgidillas" OR "Tricholestes" OR "Regulus" OR "Anthoscopus" OR "Auriparus" OR "Remiz" OR "Rhagologus" OR "Eleoscytalopus" OR "Liosceles" OR "Psilorhamphus" OR "Pteroptochos" OR "Scelorchilus" OR "Scytalopus" OR "Teledromas" OR "Rhipidura" OR "Rhodinocichla" OR "Sapayoa" OR "Sitta" OR "Spindalis" OR "Chelidorhynch" OR "Culicicapa" OR "Elminia" OR "Acridotheres" OR "Agropsar" OR "Ampeliceps" OR "Aplonis" OR "Basilornis" OR "Cinnyricinclus" OR "Creatophora" OR "Gracula" OR "Gracupica" OR "Hartlaubius" OR "Hylopsar" OR "Lamprotonis" OR "Leucopsar" OR "Mino" OR "Notopholia" OR "Onychognathus" OR "Pastor" OR "Poeoptera" OR "Rhabdornis" OR "Sarcops" OR "Scissirostrum" OR "Speculipastor" OR "Spodiopar" OR "Streptocitta" OR "Sturnia" OR "Sturnus" OR "Chamaea" OR "Chleuasicus" OR "Chloropeta" OR "Chrysomma" OR "Conostoma" OR "Fulvetta" OR "Lioparus" OR "Paradoxornis" OR "Pseudoalcippe" OR "Psittiparus" OR "Rhopophilus" OR "Sinosuthora" OR "Suthora" OR "Sylvia" OR "Teretistris" OR "Akletos" OR "Ampelornis" OR "Aprositornis" OR "Batara" OR "Cercomacra" OR "Cercomacroides" OR "Cymbilaimus" OR "Dichrozona" OR "Drymophila" OR "Dysithamnus" OR "Epinecrophylla" OR "Euchrepomis" OR "Formicivora" OR "Frederickena" OR "Gymnocichla" OR "Gymnopithys" OR "Hafferia" OR "Herpsilochmus" OR "Hylophylax" OR "Hypocnemis" OR "Hypocnemoides" OR "Hypoedaleus" OR "Isleria" OR "Mackenziaena" OR "Megastictus" OR "Microrhopias" OR "Myrmeciza" OR "Myrmelastes" OR "Myrmoborus" OR "Myrmochanes" OR "Myrmoderus" OR "Myrmophylax" OR "Myrmorchilus" OR "Myrmornis" OR "Myrmotherula" OR "Neotantes" OR "Oneillornis" OR "Percnostola" OR "Phaenostictus" OR "Phlegopsis" OR "Pithys" OR "Poliocrania" OR "Pygiptila" OR "Pyriglena" OR "Rhegmatorhina" OR "Rhopias" OR "Rhopornis" OR "Sakesphorus" OR "Sciaphylax" OR "Sclateria" OR "Sipia" OR "Taraba" OR "Thamnistes" OR "Thamnomanes" OR "Thamnophilus" OR "Willisornis" OR "Xenornis" OR "Anisognathus" OR "Bangsia" OR "Buthraupis" OR "Calochaetes" OR "Catamblyrhynchus" OR "Catamenia" OR "Charitospiza" OR "Chlorochrysa" OR "Chlorophanes" OR "Chlorornis" OR "Chrysothlypis" OR "Cissopis" OR "Cnemoscopus" OR "Coereba" OR "Compsospiza" OR "Compsothraupis" OR "Conirostrum" OR "Conothraupis" OR "Coryphospingus" OR "Creurgops" OR "Cyanerpes" OR "Cyanicterus" OR "Cypsnagra" OR "Dacnis" OR "Delothraupis" OR "Diglossa" OR "Diuca" OR "Dolospingus" OR "Donacospiza" OR "Dubusia" OR "Emberizoides" OR "Embernagra" OR "Eucometis" OR "Euneornis" OR "Geospiza" OR "Gubernatrix" OR "Haplospiza" OR "Hemispingus" OR "Hemithraupis" OR "Heterospingus" OR "Incaspiza" OR "Iridophanes" OR "Iridosornis" OR "Lanio" OR "Lophospingus" OR "Loxigilla" OR "Loxipasser" OR "Melanodera" OR "Melanospiza" OR "Melopyrrha" OR "Nemosia" OR "Nephelornis" OR "Oreomanes" OR "Oryzoborus" OR "Parkerthraustes" OR "Paroaria" OR "Phrygilus" OR "Piezorina" OR "Pipraeidea" OR "Poospiza" OR

"Pyrrhocoma" OR "Ramphocelus" OR "Rhodospingus" OR "Saltator" OR "Saltatricula" OR "Schistochlamys" OR "Sericossypha" OR "Sicalis" OR "Sporophila" OR "Stephanophorus" OR "Tachyphonus" OR "Tangara" OR "Tersina" OR "Thlyopsis" OR "Thraupis" OR "Tiaris" OR "Trichothraupis" OR "Volatinia" OR "Wetmorethraupis" OR "Xenodacnis" OR "Xenospingus" OR "Tichodroma" OR "Macronus" OR "Pomatorhinus" OR "Spelaeornis" OR "Stachyridopsis" OR "Stachyris" OR "Iodopleura" OR "Laniisoma" OR "Laniocera" OR "Myiobius" OR "Onychorhynchus" OR "Oxyruncus" OR "Pachyramphus" OR "Schiffornis" OR "Terenotriccus" OR "Tityra" OR "Xenopsaris" OR "Campylorhynchus" OR "Cantorchilus" OR "Catherpes" OR "Cinnycerthia" OR "Cistothorus" OR "Cyphorhinus" OR "Henicorhina" OR "Microcerculus" OR "Odontorchilus" OR "Pheugopedius" OR "Salpinctes" OR "Thryomanes" OR "Thryophilus" OR "Thryothorus" OR "Trogodytes" OR "Uropsila" OR "Catharus" OR "Cichlopsis" OR "Entomodestes" OR "Geokichla" OR "Hylocichla" OR "Ixoreus" OR "Myadestes" OR "Neocossyphus" OR "Ridgwayia" OR "Sialia" OR "Stizorhina" OR "Turdus" OR "Zoothera" OR "Agriornis" OR "Alectrurus" OR "Anairetes" OR "Aphanotriccus" OR "Arundinicola" OR "Atalotriccus" OR "Attila" OR "Camplostoma" OR "Casiempis" OR "Casiornis" OR "Cnemarchus" OR "Cnemotriccus" OR "Cnipodectes" OR "Colonia" OR "Colorhamphus" OR "Conopias" OR "Contopus" OR "Corythopsis" OR "Culicivora" OR "Deltarhynchus" OR "Elaenia" OR "Empidonax" OR "Empidonomus" OR "Euscarthmus" OR "Fluvicola" OR "Griseotyrannus" OR "Gubernetes" OR "Hemitriccus" OR "Heteroxolmis" OR "Hirundinea" OR "Hymenops" OR "Inezia" OR "Knipolegus" OR "Lathrotriccus" OR "Legatus" OR "Leptopogon" OR "Lessonia" OR "Lophotriccus" OR "Machetornis" OR "Mecocerculus" OR "Megarynchus" OR "Mionectes" OR "Mitrephanes" OR "Muscigralla" OR "Muscisaxicola" OR "Myiarchus" OR "Myiodynastes" OR "Myiopagis" OR "Myiophobus" OR "Myiornis" OR "Myiotheretes" OR "Myiotriccus" OR "Myiozetetes" OR "Neopipo" OR "Neoxolmis" OR "Nephelomyias" OR "Ochthoeca" OR "Ochthornis" OR "Oncostoma" OR "Ornithion" OR "Phaeomyias" OR "Philohydor" OR "Phyllomyias" OR "Phylloscartes" OR "Piprites" OR "Pitangus" OR "Platyrinchus" OR "Poecilotriccus" OR "Pogonotriccus" OR "Polioxolmis" OR "Polystictus" OR "Pseudelaenia" OR "Pseudocolaptes" OR "Pseudotriccus" OR "Pyrocephalus" OR "Pyrrhomyias" OR "Ramphotrigon" OR "Rhynchocyclus" OR "Rhytipterna" OR "Satrapa" OR "Sayornis" OR "Serpophaga" OR "Silvicultrix" OR "Sirystes" OR "Stigmatura" OR "Sublegatus" OR "Suiriri" OR "Tachuris" OR "Taniotriccus" OR "Todirostrum" OR "Tolmomyias" OR "Tumbezia" OR "Tyrannopsis" OR "Tyrannulus" OR "Tyrannus" OR "Uromyias" OR "Xenotriccus" OR "Xolmis" OR "Zimmerius" OR "Urocynchramus" OR "Artamella" OR "Calicalicus" OR "Cyanolanius" OR "Euryceros" OR "Falculea" OR "Hypositta" OR "Leptopterus" OR "Mystacornis" OR "Newtonia" OR "Oriolia" OR "Philentoma" OR "Prionops" OR "Pseudobias" OR "Schetba" OR "Tephrodornis" OR "Tylas" OR "Vanga" OR "Xenopirostris" OR "Anomalospiza" OR "Vidua" OR "Cyclarhis" OR "Erpornis" OR "Hylophilus" OR "Pteruthius" OR "Vireo" OR "Vireolanius" OR "Zeledonia" OR "Apalopteron" OR "Dasycrotapha" OR "Heleia" OR "Lophozosterops" OR "Sternhoptilus" OR "Yuhina" OR "Zosterops" OR "Zosterornis" OR "Agamia" OR "Ardea" OR "Ardeola" OR "Botaurus" OR "Bubulcus" OR "Butorides" OR "Cochlearius" OR "Dupetor" OR "Egretta" OR "Gorsachius" OR "Ixobrychus" OR "Nyctanassa" OR "Nycticorax" OR "Ptilerodius" OR "Syrigma" OR "Tigriornis" OR "Tigrisoma" OR "Zebulus" OR "Balaeniceps" OR "Pelecanus" OR "Scopus" OR "Bostrychia" OR "Eudocimus" OR "Geronticus" OR "Lophotibis" OR "Mesembrinibis" OR "Nipponia" OR "Phimosus" OR "Platalea" OR "Plegadis" OR "Pseudibis" OR "Theristicus" OR "Threskiornis" OR "Phaethon" OR "Phoeniconaias" OR "Phoenicoparrus" OR "Phoenicopterus" OR "Bucco" OR "Chelidoptera" OR "Haploptila" OR "Hypnelus" OR "Malacoptila" OR "Micromonacha" OR "Monasa" OR "Nonnula" OR "Notharchus" OR "Nystalus" OR "Capito" OR "Eubucco" OR "Brachygalba" OR "Galballyrhynchus" OR "Galbula" OR "Jacamaralcyon" OR "Jacamerops" OR "Indicator" OR "Melichneutes" OR "Melignomon" OR "Prodotiscus" OR "Buccanodon" OR "Gymnobucco" OR "Lybius" OR "Pogoniulus" OR "Stactolaema" OR "Trachyphonus" OR "Psilopogon" OR "Blythipicus" OR "Campephilus" OR "Campethera" OR "Celeus" OR "Chloropicus" OR "Chrysocolaptes" OR "Chrysophlegma" OR "Colaptes" OR "Dendrocopos" OR "Dendrocoptes" OR "Dendropicos" OR "Dinopium" OR "Dryobates" OR "Dryocopus" OR "Gecinulus" OR "Geocolaptes" OR "Jynx" OR "Leiopicus" OR "Leuconotopicus" OR "Meiglyptes" OR "Melanerpes" OR "Micropternus" OR "Mulleripicus" OR "Nesocittes" OR "Picoides" OR "Piculus" OR "Picumnus" OR "Picus" OR "Reinwardtipicus" OR "Sasia" OR "Sphyrapicus" OR "Veniliornis" OR "Yungipicus" OR "Andigena" OR "Aulacorhynchus" OR "Pteroglossus" OR "Ramphastos" OR "Selenidera" OR "Semnornis" OR "Aechmophorus" OR "Podiceps" OR "Podilymbus" OR "Poliocephalus" OR "Rollandia" OR "Tachybaptus" OR "Diomedea" OR "Phoebastria" OR "Phoebetria" OR "Thalassarche" OR "Hydrobates" OR "Oceanodroma" OR "Fregetta" OR "Garrodia" OR "Nesofregetta" OR "Oceanites" OR "Pelagodroma" OR "Aphrodroma" OR "Ardenna" OR "Bulweria" OR "Calonectris" OR "Daption" OR "Fulmarus" OR "Halobaena" OR "Macronectes" OR "Pachyptila" OR "Pagodroma" OR "Pelecanoides" OR "Procellaria" OR "Pseudobulweria" OR "Pterodroma" OR "Puffinus" OR "Thalassoica" OR "Cacatua" OR "Callocephalon" OR "Calyptorhynchus" OR "Eolophus" OR "Lophochroa" OR "Nymphicus" OR "Probosciger" OR "Alipiopsitta" OR "Amazona" OR "Anodorhynchus" OR "Ara" OR "Aratinga" OR "Bolborhynchus" OR "Brotogeris" OR "Conuropsis" OR "Cyanoliseus" OR "Cyanopsitta" OR "Deropterus" OR

"Diopsittaca" OR "Enicognathus" OR "Eupsittula" OR "Forpus" OR "Graydidascalus" OR "Guarouba" OR "Guaruba" OR "Hapalopsittaca" OR "Leptosittaca" OR "Myiopsitta" OR "Nannopsittaca" OR "Orthopsittaca" OR "Pionites" OR "Pionopsitta" OR "Pionus" OR "Poicephalus" OR "Primolius" OR "Psilopsiagon" OR "Psittacara" OR "Psittacus" OR "Pyrilia" OR "Pyrrhura" OR "Rhynchopsitta" OR "Thectocercus" OR "Touit" OR "Triclaria" OR "Agapornis" OR "Alisterus" OR "Aprosmictus" OR "Barnardius" OR "Bolbopsittacus" OR "Chalcopsitta" OR "Charmosyna" OR "Coracopsis" OR "Cyanoramphus" OR "Cyclopsitta" OR "Eclectus" OR "Eos" OR "Eunymphicus" OR "Geoffroyus" OR "Glossopsitta" OR "Lathamus" OR "Loriculus" OR "Lorius" OR "Melopsittacus" OR "Micrositta" OR "Neophema" OR "Neopsephotus" OR "Neopsittacus" OR "Northiella" OR "Oreopsittacus" OR "Parvipsitta" OR "Pezoporus" OR "Phigys" OR "Platycercus" OR "Polytelis" OR "Prioniturus" OR "Prosopiea" OR "Psephotellus" OR "Psephotus" OR "Pseudeos" OR "Psittacella" OR "Psittacula" OR "Psittaculirostris" OR "Psitteuteles" OR "Psittinus" OR "Psittichas" OR "Purpureicephalus" OR "Tanygnathus" OR "Trichoglossus" OR "Vini" OR "Nestor" OR "Strigops" OR "Pterocles" OR "Syrrhaptes" OR "Rhea" OR "Aptenodytes" OR "Eudytes" OR "Eudyptula" OR "Megadyptes" OR "Pygoscelis" OR "Spheniscus" OR "Aegolius" OR "Asio" OR "Athene" OR "Bubo" OR "Glaucidium" OR "Ketupa" OR "Lophostrix" OR "Megascops" OR "Micrathene" OR "Ninox" OR "Otus" OR "Pseudoscops" OR "Psiloscops" OR "Pulsatrix" OR "Sceloglaux" OR "Scotopelia" OR "Strix" OR "Surnia" OR "Xenoglaux" OR "Phodilus" OR "Tyto" OR "Aepyornis" OR "Mullerornis" OR "Struthio" OR "Anhinga" OR "Fregata" OR "Leucocarbo" OR "Microcarbo" OR "Nannopterum" OR "Phalacrocorax" OR "Morus" OR "Sula" OR "Crypturellus" OR "Eudromia" OR "Nothocercus" OR "Nothoprocta" OR "Nothura" OR "Rhynchotus" OR "Tinamotis" OR "Tinamus" OR "Apalharpactes" OR "Apaloderma" OR "Harpactes" OR "Pharomachrus" OR "Trogon" OR "Tetrastes" OR "Hesperiphona") AND ("reproductive success" OR "growth" OR "mating success" OR "recruitment" OR "hatching success" OR "fertility" OR "mortality" OR "longevity" OR "body condition" OR "condition" OR "body size" OR "survival" OR "clutch size" OR "breeding success" OR "recruit*" OR "eggs laid" OR "number of eggs" OR "fitness" OR "fledgling*" OR "development") AND ("anthropogenic noise" OR "traffic noise" OR "ambient noise" OR "urban noise" OR "noise pollution")) OR AK= ("songbird*" OR "passerine*" OR "bird*" OR "aves" OR "avian" OR "ornithol*" OR "passeriform*" OR "Accipiter" OR "Aegypius" OR "Aquila" OR "Aviceda" OR "Busarellus" OR "Butastur" OR "Buteo" OR "Buteogallus" OR "Chondrohierax" OR "Circaetus" OR "Circus" OR "Clanga" OR "Elanoides" OR "Elanus" OR "Gampsonyx" OR "Geranoaetus" OR "Geranospiza" OR "Gypaetus" OR "Gypohierax" OR "Gyps" OR "Haliaeetus" OR "Haliastur" OR "Harpagus" OR "Harpia" OR "Hieraetus" OR "Ictinaetus" OR "Ictinia" OR "Kaupifalco" OR "Leptodon" OR "Leucopternis" OR "Lophotriorchis" OR "Milvus" OR "Morphnarchus" OR "Morphnus" OR "Necrosyrtes" OR "Neophron" OR "Nisaetus" OR "Parabuteo" OR "Pernis" OR "Pithecophaga" OR "Polemaetus" OR "Pseudastur" OR "Rostrhamus" OR "Rupornis" OR "Sarcogyps" OR "Spilornis" OR "Spizaetus" OR "Stephanoaetus" OR "Terathopius" OR "Torgos" OR "Trigonoceps" OR "Cathartes" OR "Coragyps" OR "Gymnogyps" OR "Sarcoramphus" OR "Vultur" OR "Pandion" OR "Sagittarius" OR "Aix" OR "Alopochen" OR "Amazonetta" OR "Anas" OR "Anser" OR "Asarcornis" OR "Aythya" OR "Branta" OR "Bucephala" OR "Cairina" OR "Callonetta" OR "Cereopsis" OR "Chen" OR "Chenonetta" OR "Chloephaga" OR "Clangula" OR "Coscoroba" OR "Cyanochen" OR "Cygnus" OR "Dendrocygna" OR "Heteronetta" OR "Histrionicus" OR "Hymenolaimus" OR "Lophodytes" OR "Lophonetta" OR "Malacorhynchus" OR "Mareca" OR "Marmaronetta" OR "Melanitta" OR "Merganetta" OR "Mergellus" OR "Mergus" OR "Neochen" OR "Netta" OR "Nettapus" OR "Nomonyx" OR "Oxyura" OR "Plectropterus" OR "Polysticta" OR "Pteronetta" OR "Sarkidiornis" OR "Sibirionetta" OR "Somateria" OR "Spatula" OR "Tachyeres" OR "Tadorna" OR "Thalassornis" OR "Anhima" OR "Chauna" OR "Anseranas" OR "Aegotheles" OR "Aerodramus" OR "Aeronauts" OR "Apus" OR "Chaetura" OR "Collocalia" OR "Cypseloides" OR "Cypsiurus" OR "Hirundapus" OR "Panyptila" OR "Streptoprocne" OR "Tachornis" OR "Tachymarpis" OR "Hemiprocne" OR "Abeillia" OR "Adelomyia" OR "Aglaeactis" OR "Aglaiocercus" OR "Amazilia" OR "Androdon" OR "Anopetia" OR "Anthocephala" OR "Anthracothorax" OR "Archilochus" OR "Atthis" OR "Augastes" OR "Avocettula" OR "Basilinna" OR "Boissonneaua" OR "Calliphlox" OR "Calypste" OR "Campylopterus" OR "Chaetocercus" OR "Chalcostigma" OR "Chalybura" OR "Chlorestes" OR "Chlorostilbon" OR "Chrysolampis" OR "Chrysurnia" OR "Clytolaema" OR "Coeligena" OR "Colibri" OR "Cyanophaia" OR "Cynanthus" OR "Discosura" OR "Doricha" OR "Doryfera" OR "Elvira" OR "Ensifera" OR "Eriocnemis" OR "Eugenies" OR "Eulampis" OR "Eulidia" OR "Eupetomena" OR "Eupherusa" OR "Eutoxeres" OR "Florisuga" OR "Glaucis" OR "Goethalsia" OR "Goldmania" OR "Haplophaedia" OR "Heliactin" OR "Heliangelus" OR "Heliodoxa" OR "Heliomaster" OR "Heliophryx" OR "Hylocharis" OR "Juliamyia" OR "Klais" OR "Lafresnaya" OR "Lampornis" OR "Lamprolaima" OR "Lepidopyga" OR "Lesbia" OR "Leucippus" OR "Leucochloris" OR "Lophornis" OR "Mellisuga" OR "Metallura" OR "Microchera" OR "Myrmia" OR "Myrtis" OR "Ocreatus" OR "Opisthoprora" OR "Oreonympha" OR "Oreotrochilus" OR "Orthorhynchus" OR "Oxygogon" OR "Panterpe" OR "Patagona" OR "Phaeochroa" OR "Phaethornis" OR "Phlogophilus" OR "Polyonymus" OR "Polytmus" OR "Pterophanes" OR "Ramphodon" OR "Ramphomicron" OR "Rhodopsis" OR "Sappho" OR "Schistes" OR "Selasphorus" OR "Sephanoidea" OR

"Stephanoxis" OR "Sternoclyta" OR "Taphrospilus" OR "Thalurania" OR "Thaumastura" OR "Threnetes" OR "Topaza" OR "Trochilus" OR "Urochroa" OR "Urosticte" OR "Apteryx" OR "Anthracoceros" OR "Buceros" OR "Bycanistes" OR "Lophoceros" OR "Penelopides" OR "Rhabdotorrhinus" OR "Rhyticeros" OR "Tockus" OR "Bucorvus" OR "Phoeniculus" OR "Rhinopomastus" OR "Upupa" OR "Antrostomus" OR "Caprimulgus" OR "Chordeiles" OR "Eleothreptus" OR "Eurostopodus" OR "Hydropsalis" OR "Lurocalis" OR "Lyncornis" OR "Nyctidromus" OR "Nyctiphrynus" OR "Nyctipolus" OR "Nyctiprogne" OR "Phalaenoptilus" OR "Setopagis" OR "Systellura" OR "Uropsalis" OR "Nyctibius" OR "Batrachostomus" OR "Podargus" OR "Steatornis" OR "Cariama" OR "Casuarius" OR "Dromaius" OR "Aethia" OR "Alca" OR "Alle" OR "Brachyramphus" OR "Cephus" OR "Cerorhinca" OR "Fratricula" OR "Pinguinus" OR "Ptychoramphus" OR "Synthliboramphus" OR "Uria" OR "Burhinus" OR "Anarhynchus" OR "Charadrius" OR "Elseyornis" OR "Erythrogonys" OR "Hoploxypterus" OR "Oreopholus" OR "Peltodytes" OR "Phegornis" OR "Pluvialis" OR "Thinornis" OR "Vanellus" OR "Chionis" OR "Dromas" OR "Cursorius" OR "Glareola" OR "Rhinoptilus" OR "Stiltia" OR "Haematopus" OR "Actophilornis" OR "Hydrophasianus" OR "Irediparra" OR "Jacana" OR "Metopidius" OR "Microparra" OR "Anous" OR "Chlidonias" OR "Chroicocephalus" OR "Creagrus" OR "Gelochelidon" OR "Gygis" OR "Hydrocoloeus" OR "Hydroprogne" OR "Ichthyaeus" OR "Larosterna" OR "Larus" OR "Leucophaeus" OR "Onychoprion" OR "Pagophila" OR "Phaetusa" OR "Rhodostethia" OR "Rissa" OR "Rynchops" OR "Sterna" OR "Sternula" OR "Thalasseus" OR "Xema" OR "Pedionomus" OR "Pluvianellus" OR "Pluvianus" OR "Himantopus" OR "Recurvirostra" OR "Nycticryphes" OR "Rostratula" OR "Actitis" OR "Arenaria" OR "Bartramia" OR "Calidris" OR "Coenocorypha" OR "Gallinago" OR "Limnodromus" OR "Limosa" OR "Lymnocyrtus" OR "Numenius" OR "Phalaropus" OR "Scolopax" OR "Tringa" OR "Xenus" OR "Stercorarius" OR "Attagus" OR "Thinocorus" OR "Turnix" OR "Ciconia" OR "Ephippiorhynchus" OR "Jabiru" OR "Leptoptilos" OR "Mycteria" OR "Colius" OR "Urocolius" OR "Alectroenas" OR "Alopecoenas" OR "Caloenas" OR "Chalcophaps" OR "Claravis" OR "Columba" OR "Columbina" OR "Didunculus" OR "Drepanoptila" OR "Ducula" OR "Ectopistes" OR "Gallicolumba" OR "Geopelia" OR "Geophaps" OR "Geotrygon" OR "Goura" OR "Gymnophaps" OR "Hemiphaga" OR "Henicophaps" OR "Leptotila" OR "Leptotrygon" OR "Leucosarcia" OR "Lopholaimus" OR "Macropygia" OR "Metriopelia" OR "Ocyphaps" OR "Oena" OR "Otidiphaps" OR "Patagioenas" OR "Petrophassa" OR "Pezophaps" OR "Phapitreron" OR "Phaps" OR "Ptilinopus" OR "Raphus" OR "Reinwardtoena" OR "Spilopelia" OR "Streptopelia" OR "Treron" OR "Trugon" OR "Turacoena" OR "Turtur" OR "Uropelia" OR "Zenaida" OR "Zentrygon" OR "Actenoides" OR "Alcedo" OR "Caridonax" OR "Ceryle" OR "Ceyx" OR "Chloroceryle" OR "Cittura" OR "Corythornis" OR "Dacelo" OR "Halcyon" OR "Ispidina" OR "Lacedo" OR "Megaceryle" OR "Melidora" OR "Syma" OR "Tanyptera" OR "Todiramphus" OR "Atelornis" OR "Brachypteracias" OR "Geobiastes" OR "Coracias" OR "Eurystomus" OR "Merops" OR "Nyctornis" OR "Baryphthengus" OR "Electron" OR "Eumomota" OR "Hylomanes" OR "Momotus" OR "Todus" OR "Cacomantis" OR "Carpococcyx" OR "Centropus" OR "Cercococcyx" OR "Chrysococcyx" OR "Clamator" OR "Coccyzus" OR "Coccyzus" OR "Coua" OR "Crotaphaga" OR "Cuculus" OR "Dasylophus" OR "Dromococcyx" OR "Eudynamys" OR "Geococcyx" OR "Guira" OR "Hierococcyx" OR "Morococcyx" OR "Neomorphus" OR "Pachycoccyx" OR "Phaenicophaeus" OR "Piaya" OR "Rhinortha" OR "Scythrops" OR "Surniculus" OR "Tapera" OR "Urodynamis" OR "Zanclostomus" OR "Dinornis" OR "Anomalopteryx" OR "Emeus" OR "Euryapteryx" OR "Eurypyga" OR "Rhynchoceros" OR "Caracara" OR "Daptrius" OR "Falco" OR "Herpetotheres" OR "Ibycter" OR "Micrastur" OR "Microhierax" OR "Milvago" OR "Phalcoboenus" OR "Polihierax" OR "Spiziapteryx" OR "Aburria" OR "Chamaeetes" OR "Crax" OR "Mitro" OR "Nothocrax" OR "Oreophaps" OR "Ortalis" OR "Pauxi" OR "Penelope" OR "Penelopina" OR "Pipile" OR "Alectura" OR "Megapodius" OR "Acryllium" OR "Guttera" OR "Numida" OR "Callipepla" OR "Colinus" OR "Cyrtonyx" OR "Dendrortyx" OR "Odontophorus" OR "Oreortyx" OR "Philortyx" OR "Ptilopachus" OR "Rhynchortyx" OR "Alectoris" OR "Ammoperdix" OR "Arborophila" OR "Argusianus" OR "Bambusicola" OR "Bonasa" OR "Caloperdix" OR "Centrocerus" OR "Chrysolophus" OR "Coturnix" OR "Crossoptilon" OR "Dendragapus" OR "Excalfactoria" OR "Falcipennis" OR "Francolinus" OR "Gallus" OR "Haematortyx" OR "Ithaginis" OR "Lagopus" OR "Lerwa" OR "Lophophorus" OR "Lophura" OR "Lyrurus" OR "Meleagris" OR "Pavo" OR "Peliperdix" OR "Perdix" OR "Phasianus" OR "Polyplectron" OR "Pternistis" OR "Pucrasia" OR "Rhizothera" OR "Rollulus" OR "Scleroptila" OR "Syrmaticus" OR "Tetrao" OR "Tetraogallus" OR "Tetraophaps" OR "Tragopan" OR "Tymanuchus" OR "Gavia" OR "Aramus" OR "Anthropoides" OR "Antigone" OR "Balearica" OR "Bugeranus" OR "Grus" OR "Leucogeranus" OR "Heliornis" OR "Psophia" OR "Aenigmatolimnas" OR "Amaurolimnas" OR "Amauornis" OR "Anurolimnas" OR "Aramides" OR "Atlantisia" OR "Coturnicops" OR "Crex" OR "Dryolimnas" OR "Eulabeornis" OR "Fulica" OR "Gallicrex" OR "Gallinula" OR "Gallirallus" OR "Laterallus" OR "Lewinia" OR "Micropygia" OR "Neocrex" OR "Nesoclopeus" OR "Paragallinula" OR "Pardirallus" OR "Porphyrio" OR "Porphyriops" OR "Porzana" OR "Rallula" OR "Rallina" OR "Rallus" OR "Tribonyx" OR "Canirallus" OR "Sarothrura" OR "Leptosomus" OR "Corythaëola" OR "Corythaixoides" OR "Crinifer" OR "Musophaga" OR "Tauraco" OR "Opisthocomus" OR "Afrotis" OR "Ardeotis" OR "Chlamydotis" OR "Neotis" OR "Otis" OR "Tetrax" OR "Acanthisitta" OR

"Pachyplichas" OR "Traversia" OR "Xenicus" OR "Acanthiza" OR "Acanthornis" OR "Aethomyias" OR "Aphelocephala" OR "Calamanthus" OR "Gerygone" OR "Hylacola" OR "Neosericornis" OR "Oreoscopus" OR "Origma" OR "Pachycare" OR "Pycnoptilus" OR "Pyrrholaemus" OR "Sericornis" OR "Smicronis" OR "Acrocephalus" OR "Arundinax" OR "Calamonastides" OR "Hippolais" OR "Iduna" OR "Nesillas" OR "Aegithalos" OR "Leptopoecile" OR "Psaltiriparus" OR "Aegithina" OR "Alaemon" OR "Alauda" OR "Alaudala" OR "Ammomanes" OR "Calandrella" OR "Calendulauda" OR "Chersomanes" OR "Eremophila" OR "Eremopterix" OR "Galerida" OR "Lullula" OR "Melanocorypha" OR "Mirafr" OR "Pinarocorys" OR "Spizocorys" OR "Artamus" OR "Gymnorhina" OR "Melloria" OR "Bombycilla" OR "Buphagus" OR "Calcarius" OR "Plectrophenax" OR "Rhynchophanes" OR "Callaeas" OR "Heteralocha" OR "Philesturnus" OR "Calyptophilus" OR "Campephaga" OR "Ceblepyris" OR "Coracina" OR "Edolisoma" OR "Lalage" OR "Malindangia" OR "Pericrocotus" OR "Amaurospiza" OR "Cardinalis" OR "Caryothraustes" OR "Chlorothraupis" OR "Cyanocompsa" OR "Cyanoloxia" OR "Granatellus" OR "Habia" OR "Passerina" OR "Periporphyrus" OR "Pheucticus" OR "Piranga" OR "Spiza" OR "Certhia" OR "Salpornis" OR "Abroscopus" OR "Cettia" OR "Horornis" OR "Phyllergates" OR "Tesia" OR "Urosphena" OR "Chloropsis" OR "Cinclus" OR "Apalis" OR "Artisornis" OR "Camaroptera" OR "Cisticola" OR "Eremomela" OR "Heliolais" OR "Hypergerus" OR "Neomixis" OR "Oreolais" OR "Orthotomus" OR "Phragmacia" OR "Poliolais" OR "Prinia" OR "Schistolais" OR "Urolais" OR "Urorhipis" OR "Climacteris" OR "Cormobates" OR "Conopophaga" OR "Struthidea" OR "Aphelocoma" OR "Calocitta" OR "Cissa" OR "Coloeus" OR "Corvus" OR "Cyanocitta" OR "Cyanocorax" OR "Cyanolyca" OR "Cyanopica" OR "Dendrocitta" OR "Garrulus" OR "Gymnorhinus" OR "Nucifraga" OR "Perisoreus" OR "Pica" OR "Platylophus" OR "Podoces" OR "Psilorhinus" OR "Ptilotomus" OR "Pyrrhonorax" OR "Urocissa" OR "Ampelioides" OR "Ampelion" OR "Carpornis" OR "Cephalopterus" OR "Conioptilon" OR "Cotinga" OR "Doliornis" OR "Gymnoderus" OR "Haematoderus" OR "Lipaugus" OR "Perissocephalus" OR "Phoenicircus" OR "Phytotoma" OR "Pipreola" OR "Porphyrulaema" OR "Procnias" OR "Pyroderus" OR "Querula" OR "Rupicola" OR "Snowornis" OR "Xipholena" OR "Zaratornis" OR "Dasyornis" OR "Dicaeum" OR "Prionochilus" OR "Dicrurus" OR "Donacobius" OR "Dulus" OR "Emberiza" OR "Amadina" OR "Amandava" OR "Cryptospiza" OR "Erythrura" OR "Estrilda" OR "Euodice" OR "Euschistospiza" OR "Lagonosticta" OR "Lonchura" OR "Mandingoa" OR "Neochmia" OR "Nesocharis" OR "Nigrita" OR "Ortygospiza" OR "Parmoptila" OR "Pyrenestes" OR "Pytilia" OR "Spermophaga" OR "Stagonopleura" OR "Taeniopygia" OR "Uraeginthus" OR "Calyptomena" OR "Cymbirhynchus" OR "Eurylaimus" OR "Psarisomus" OR "Serilophus" OR "Smithornis" OR "Chamaeza" OR "Formicarius" OR "Acanthis" OR "Agraphospiza" OR "Akialoa" OR "Bucanetes" OR "Carduelis" OR "Carpodacus" OR "Chloris" OR "Chlorodrepanis" OR "Chlorophonia" OR "Chrysocorythus" OR "Coccothraustes" OR "Crithagra" OR "Drepanis" OR "Eophona" OR "Euphonia" OR "Fringilla" OR "Haemorrhous" OR "Hemignathus" OR "Himatione" OR "Leucosticte" OR "Linaria" OR "Linurgus" OR "Loxia" OR "Loxioides" OR "Loxops" OR "Magnumma" OR "Melamprosops" OR "Oreomystis" OR "Paroreomyza" OR "Pinicola" OR "Procarduelis" OR "Pseudonestor" OR "Psittirostra" OR "Pyrrhoptectus" OR "Pyrrhula" OR "Rhodopechys" OR "Rhodospiza" OR "Serinus" OR "Spinus" OR "Telespiza" OR "Anabacerthia" OR "Anabazenops" OR "Ancistrops" OR "Anumbius" OR "Aphrastura" OR "Asthenes" OR "Automolus" OR "Berlepschia" OR "Campylorhamphus" OR "Certhiasomus" OR "Certhiaxis" OR "Cinclodes" OR "Clibanornis" OR "Coryphistera" OR "Craniola" OR "Deconychura" OR "Dendrexetastes" OR "Dendrocincla" OR "Dendrocolaptes" OR "Dendroplex" OR "Drymornis" OR "Drymoxerops" OR "Furnarius" OR "Geocerythra" OR "Geositta" OR "Glyphorhynchus" OR "Heliobletus" OR "Hellmayrea" OR "Hylexetastes" OR "Lepidocolaptes" OR "Leptasthenura" OR "Limnortyx" OR "Limnornis" OR "Lochmias" OR "Margarornis" OR "Mazaria" OR "Megaxenops" OR "Metopothrix" OR "Microxenops" OR "Nasica" OR "Ochetorhynchus" OR "Phacellodomus" OR "Philydor" OR "Phleocryptes" OR "Premnoplex" OR "Premnornis" OR "Pseudasthenes" OR "Pseudocolaptes" OR "Pseudoseisura" OR "Pygarrhichas" OR "Roraimia" OR "Schoeniophylax" OR "Sclerurus" OR "Sittasomus" OR "Spartonoica" OR "Sylviorthorhynchus" OR "Synallaxis" OR "Syndactyla" OR "Tarphonornis" OR "Thripadectes" OR "Thriponhaga" OR "Upucerthia" OR "Xenerpestes" OR "Xenops" OR "Xiphocolaptes" OR "Xiphorhynchus" OR "Grallaria" OR "Grallaricula" OR "Hylloperus" OR "Myrmothera" OR "Alopochelidon" OR "Atticora" OR "Cecropis" OR "Delichon" OR "Haplochelidon" OR "Hirundo" OR "Neochelidon" OR "Notiochelidon" OR "Orochelidon" OR "Petrochelidon" OR "Phedina" OR "Progne" OR "Psilidoprocne" OR "Pseudhirundo" OR "Pseudochelidon" OR "Ptyonoprogne" OR "Riparia" OR "Stelgidopteryx" OR "Tachycineta" OR "Hylota" OR "Hypocolius" OR "Agelaioides" OR "Agelaius" OR "Agelastacus" OR "Amblycercus" OR "Amblyramphus" OR "Anumara" OR "Cacicus" OR "Chrysomus" OR "Curaeus" OR "Dives" OR "Dolichonyx" OR "Euphagus" OR "Gnorimopsar" OR "Gymnomystax" OR "Hypopyrrhus" OR "Icterus" OR "Lamprospira" OR "Leistes" OR "Macroagelaius" OR "Molothrus" OR "Nesopsar" OR "Oreopsar" OR "Psarocolius" OR "Pseudoleistes" OR "Quiscalus" OR "Sturnella" OR "Xanthocephalus" OR "Xanthopsar" OR "Icteria" OR "Ifrita" OR "Irena" OR "Corvinella" OR "Eurocephalus" OR "Lanius" OR "Actinodura" OR "Argya" OR "Garrulax" OR "Grammatoptila" OR "Heterophasia" OR "Lanthocincla" OR "Laniellus" OR

"Leiothrix" OR "Liocichla" OR "Minla" OR "Pterorhinus" OR "Trochalopteron" OR "Turdoides" OR "Bradypterus" OR "Cincloramphus" OR "Helopsaltes" OR "Locustella" OR "Megalurus" OR "Poodytes" OR "Machaerirhynchus" OR "Graueria" OR "Hylia" OR "Macrosphenus" OR "Melocichla" OR "Sylvietta" OR "Chlorophoneus" OR "Dryoscopus" OR "Laniarius" OR "Malaconotus" OR "Nilaus" OR "Rhodophoneus" OR "Tchagra" OR "Telophorus" OR "Amytornis" OR "Chenorhamphus" OR "Clytomyias" OR "Malurus" OR "Stipiturus" OR "Melampitta" OR "Melanocharis" OR "Oedistoma" OR "Toxorhamphus" OR "Melanopareia" OR "Acanthagenys" OR "Acanthorhynchus" OR "Anthochaera" OR "Anthornis" OR "Caligavis" OR "Entomyzon" OR "Epthianura" OR "Glycifolia" OR "Gymnomyza" OR "Lichmera" OR "Manorina" OR "Melidectes" OR "Melilestes" OR "Meliphaga" OR "Melipotes" OR "Melithreptus" OR "Myzomela" OR "Nesoptilotis" OR "Philemon" OR "Phylidonyris" OR "Prosthemadera" OR "Ptiloprora" OR "Ptilotula" OR "Pycnopygius" OR "Timeliopsis" OR "Xanthotis" OR "Menura" OR "Allenia" OR "Cincloerchia" OR "Dumetella" OR "Margarops" OR "Melanoptila" OR "Melanotis" OR "Mimus" OR "Oreoscoptes" OR "Ramphocinclus" OR "Toxostoma" OR "Lamprospiza" OR "Mitrospingus" OR "Moho" OR "Mohoua" OR "Arses" OR "Carterornis" OR "Clytorhynchus" OR "Grallina" OR "Hypothymis" OR "Monarcha" OR "Myiagra" OR "Symposiachrus" OR "Terpsiphone" OR "Trochocercus" OR "Anthus" OR "Macronyx" OR "Motacilla" OR "Alethe" OR "Anthipes" OR "Brachypteryx" OR "Calliope" OR "Campicoloides" OR "Cercotrichas" OR "Chamaetylas" OR "Copsychus" OR "Cossypha" OR "Cyanoptila" OR "Cyornis" OR "Enicurus" OR "Erithacus" OR "Eumyias" OR "Ficedula" OR "Fraseria" OR "Irania" OR "Larvivora" OR "Leonardina" OR "Luscinia" OR "Melaenornis" OR "Monticola" OR "Muscicapa" OR "Myiomela" OR "Myioparus" OR "Myophonus" OR "Myrmecocichla" OR "Niltava" OR "Oenanthe" OR "Phoenicurus" OR "Pogonocichla" OR "Saxicola" OR "Sheppardia" OR "Sholicola" OR "Stiphornis" OR "Tarsiger" OR "Thamnotlaea" OR "Vauriella" OR "Aethopyga" OR "Anabathmis" OR "Anthreptes" OR "Arachnothera" OR "Chalcomitra" OR "Cinnyris" OR "Cyanomitra" OR "Deleornis" OR "Hedydipna" OR "Kurochkinogramma" OR "Leptocoma" OR "Nectarinia" OR "Daphoenositta" OR "Nesospingus" OR "Nicator" OR "Notiomystis" OR "Aleadryas" OR "Oriolus" OR "Pitohui" OR "Sphecotheres" OR "Turnagra" OR "Colluricincla" OR "Falcunculus" OR "Melanorectes" OR "Pachycephala" OR "Pseudorectes" OR "Panurus" OR "Cicinnurus" OR "Diphyllodes" OR "Manucodia" OR "Paradisaea" OR "Ptiloris" OR "Paramythia" OR "Pardalotus" OR "Baeolophus" OR "Cephalopyrus" OR "Cyanistes" OR "Lophophanes" OR "Machlolophus" OR "Melaniparus" OR "Melanochlora" OR "Pardaliparus" OR "Parus" OR "Periparus" OR "Poecile" OR "Pseudopodoces" OR "Sittiparus" OR "Sylviparus" OR "Basileuterus" OR "Cardellina" OR "Catharopeza" OR "Dendroica" OR "Geothlypis" OR "Helmitheros" OR "Leiothlypis" OR "Limnolytis" OR "Mniotilta" OR "Myioborus" OR "Myiothlypis" OR "Oporornis" OR "Oreothlypis" OR "Parkesia" OR "Protonotaria" OR "Seiurus" OR "Setophaga" OR "Vermivora" OR "Aimophila" OR "Ammodramus" OR "Amphispiza" OR "Arremon" OR "Arremonops" OR "Artemisiospiza" OR "Atlapetes" OR "Calamospiza" OR "Chlorospingus" OR "Chondestes" OR "Junco" OR "Melospiza" OR "Melozone" OR "Oreothraupis" OR "Oriturus" OR "Passerculus" OR "Passerella" OR "Peucaea" OR "Pezopetes" OR "Pipilo" OR "Poecetes" OR "Pselliophorus" OR "Rhynchospiza" OR "Spizella" OR "Spizelloides" OR "Xenospiza" OR "Zonotrichia" OR "Carpodacus" OR "Gymnoris" OR "Hypocryptadius" OR "Montifringilla" OR "Onychostreus" OR "Passer" OR "Petronia" OR "Pyrgilauda" OR "Alcippe" OR "Gampsorhynchus" OR "Illadopsis" OR "Jabouilleia" OR "Kenopia" OR "Laticilla" OR "Malacocincla" OR "Malacopteron" OR "Napothera" OR "Pellorneum" OR "Rimantor" OR "Trichastoma" OR "Amalocichla" OR "Drymodes" OR "Eopsaltria" OR "Eugerygone" OR "Heteromyias" OR "Melanodryas" OR "Microeca" OR "Monachella" OR "Pachycephalopsis" OR "Peneoanthe" OR "Peneothello" OR "Petroica" OR "Poecilodryas" OR "Tregellasia" OR "Peucedramus" OR "Microligea" OR "Phaenicophilus" OR "Xenoligea" OR "Phylloscopus" OR "Picathartes" OR "Antilophia" OR "Ceratopipra" OR "Chiroxiphia" OR "Chloropipo" OR "Corapipo" OR "Cryptopipo" OR "Heterocercus" OR "Ilicura" OR "Lepidothrix" OR "Machaeropterus" OR "Manacus" OR "Masius" OR "Neopelma" OR "Pipra" OR "Pseudopipra" OR "Tyrannetes" OR "Xenopipo" OR "Erythropitta" OR "Hydornis" OR "Pitta" OR "Batis" OR "Platysteira" OR "Anaplectes" OR "Bubalornis" OR "Euplectes" OR "Malimbus" OR "Plocepasser" OR "Ploceus" OR "Quelea" OR "Sporopipes" OR "Pnoepyga" OR "Microbates" OR "Polioptila" OR "Ramphocaelus" OR "Garritornis" OR "Prunella" OR "Cinclosoma" OR "Ptilorhoa" OR "Phainopepla" OR "Phainoptila" OR "Ptiliogonys" OR "Ailuroedus" OR "Amblyornis" OR "Ptilonorhynchus" OR "Sericulus" OR "Alphoixus" OR "Andropadus" OR "Arizelocichla" OR "Atimastillas" OR "Baeopogon" OR "Bleda" OR "Chlorocichla" OR "Criniger" OR "Eurillas" OR "Hemixos" OR "Hypsipetes" OR "Iole" OR "Ixos" OR "Neolestes" OR "Phyllastrephus" OR "Pycnonotus" OR "Spizixos" OR "Stelgidillas" OR "Tricholestes" OR "Regulus" OR "Anthoscopus" OR "Auriparus" OR "Remiz" OR "Rhagologus" OR "Eleoscytalopus" OR "Liosceles" OR "Psilorhamphus" OR "Pteroptochos" OR "Scelorchilus" OR "Scytalopus" OR "Teledromas" OR "Rhipidura" OR "Rhodinocichla" OR "Sapayoa" OR "Sitta" OR "Spindalis" OR "Chelidorhynchus" OR "Culicicapa" OR "Elminia" OR "Acridotheres" OR "Agropsar" OR "Ampeliceps" OR "Aplonis" OR "Basilonis" OR "Cinnyricincla" OR "Creatophora" OR "Gracula" OR "Gracupica" OR "Hartlaubius" OR "Hylopsar" OR "Lamprotornis" OR "Leucopsar" OR "Mino" OR "Notopholia"

OR "Onychognathus" OR "Pastor" OR "Poeoptera" OR "Rhabdornis" OR "Sarcops" OR "Scissirostrum" OR "Speculipastor" OR "Spodiopsar" OR "Streptocitta" OR "Sturnia" OR "Sturnus" OR "Chamaea" OR "Chleuasicus" OR "Chloropeta" OR "Chrysomma" OR "Conostoma" OR "Fulvetta" OR "Lioparus" OR "Paradoxornis" OR "Pseudoalcippe" OR "Psittiparus" OR "Rhopophilus" OR "Sinosuthora" OR "Suthora" OR "Sylvia" OR "Teretistris" OR "Akletos" OR "Ampelornis" OR "Aprositornis" OR "Batara" OR "Cercomacra" OR "Cercomacroides" OR "Cymbilaimus" OR "Dichrozona" OR "Drymophila" OR "Dysithamnus" OR "Epinecrophylla" OR "Euchrepomis" OR "Formicivora" OR "Frederickena" OR "Gymnocichla" OR "Gymnopathys" OR "Hafferia" OR "Herpsilochmus" OR "Hylophylax" OR "Hypocnemis" OR "Hypocnemoides" OR "Hypoedaleus" OR "Isleria" OR "Mackenziaena" OR "Megastictus" OR "Microrhopias" OR "Myrmeciza" OR "Myrmelastes" OR "Myrmoborus" OR "Myrmochanes" OR "Myrmoderus" OR "Myrmophylax" OR "Myrmorchilus" OR "Myrmornis" OR "Myrmotherula" OR "Neoctantes" OR "Oneillornis" OR "Percnostola" OR "Phaenostictus" OR "Phlegopsis" OR "Pithys" OR "Poliocrania" OR "Pygiptila" OR "Pyriglena" OR "Rhegmatorhina" OR "Rhopias" OR "Rhopornis" OR "Sakesphorus" OR "Sciaphylax" OR "Sclateria" OR "Sipia" OR "Taraba" OR "Thamnistes" OR "Thamnomanes" OR "Thamnophilus" OR "Willisornis" OR "Xenornis" OR "Anisognathus" OR "Bangsia" OR "Buthraupis" OR "Calochaetes" OR "Catamblyrhynchus" OR "Catamenia" OR "Charitospiza" OR "Chlorochrysa" OR "Chlorophanes" OR "Chlorornis" OR "Chrysothlypis" OR "Cissopis" OR "Cnemoscopus" OR "Coereba" OR "Compsospiza" OR "Compsophris" OR "Conirostrum" OR "Conothraupis" OR "Coryphospingus" OR "Creurgops" OR "Cyanerpes" OR "Cyanicterus" OR "Cypsnagra" OR "Dacnis" OR "Delothraupis" OR "Diglossa" OR "Diuca" OR "Dolospingus" OR "Donacospiza" OR "Dubusia" OR "Emberizoides" OR "Embernagra" OR "Eucometis" OR "Euneornis" OR "Geospiza" OR "Gubernatrix" OR "Haplospiza" OR "Hemispingus" OR "Hemithraupis" OR "Heterospingus" OR "Incaspiza" OR "Iridophanes" OR "Iridosornis" OR "Lanio" OR "Lophospingus" OR "Loxigilla" OR "Loxipasser" OR "Melanodera" OR "Melanospiza" OR "Melopyrrha" OR "Nemosia" OR "Nephelornis" OR "Oreomanes" OR "Oryzoborus" OR "Parkerthraustes" OR "Paroaria" OR "Phrygilus" OR "Piezorina" OR "Pipraeidea" OR "Poospiza" OR "Pyrrhocomma" OR "Ramphocelus" OR "Rhodospingus" OR "Saltator" OR "Saltatricula" OR "Schistochlamys" OR "Sericossypha" OR "Sicalis" OR "Sporophila" OR "Stephanophorus" OR "Tachyphonus" OR "Tangara" OR "Tersina" OR "Thlypopsis" OR "Thraupis" OR "Tiaris" OR "Trichothraupis" OR "Volatinia" OR "Wetmorethraupis" OR "Xenodacnis" OR "Xenospingus" OR "Tichodroma" OR "Macronus" OR "Pomatorhinus" OR "Spelaornis" OR "Stachyridopsis" OR "Stachyris" OR "Iodopleura" OR "Laniisoma" OR "Laniocera" OR "Myiobius" OR "Onychorhynchus" OR "Oxyruncus" OR "Pachyramphus" OR "Schiffornis" OR "Terenotriccus" OR "Tityra" OR "Xenopsaris" OR "Campylorhynchus" OR "Cantorchilus" OR "Catherpes" OR "Cinnycerthia" OR "Cistothorus" OR "Cyphorhinus" OR "Henicorhina" OR "Microcerculus" OR "Odontorchilus" OR "Pheugopedius" OR "Salpinctes" OR "Thryomanes" OR "Thryophilus" OR "Thryothorus" OR "Trogodytes" OR "Uropsila" OR "Catharus" OR "Cichlopsis" OR "Entomodestes" OR "Geokichla" OR "Hylocichla" OR "Ixoreus" OR "Myadestes" OR "Neocossyphus" OR "Ridgwayia" OR "Sialia" OR "Stizorhina" OR "Turdus" OR "Zoothera" OR "Agriornis" OR "Alecturus" OR "Anairetes" OR "Aphanotriccus" OR "Arundinicola" OR "Atalotriccus" OR "Attila" OR "Camplostoma" OR "Casiempis" OR "Casiornis" OR "Cnemarchus" OR "Cnemotriccus" OR "Cnipodectes" OR "Colonia" OR "Colorhamphus" OR "Conopias" OR "Contopus" OR "Corythopsis" OR "Culicivora" OR "Deltarhynchus" OR "Elaenia" OR "Empidonax" OR "Empidonomus" OR "Euscarthmus" OR "Fluvicola" OR "Griseotyrannus" OR "Gubernates" OR "Hemitriccus" OR "Heteroxolmis" OR "Hirundinea" OR "Hymenops" OR "Inezia" OR "Knipolegus" OR "Lathrotriccus" OR "Legatus" OR "Leptopogon" OR "Lessonia" OR "Lophotriccus" OR "Machetornis" OR "Mecocerculus" OR "Megarynchus" OR "Mionectes" OR "Mitrephanes" OR "Muscigralla" OR "Muscisaxicola" OR "Myiarchus" OR "Myiodynastes" OR "Myiopagis" OR "Myiophobus" OR "Myiornis" OR "Myiotheretes" OR "Myiotriccus" OR "Myiozetetes" OR "Neopipo" OR "Neoxolmis" OR "Nephelomyias" OR "Ochthoeca" OR "Ochthornis" OR "Oncostoma" OR "Ornithion" OR "Phaeomyias" OR "Philohydor" OR "Phyllomyias" OR "Phylloscartes" OR "Piprites" OR "Pitangus" OR "Platyrinchus" OR "Poecilotriccus" OR "Pogonotriccus" OR "Polioxolmis" OR "Polystictus" OR "Pseudelaenia" OR "Pseudocolaptes" OR "Pseudotriccus" OR "Pyrocephalus" OR "Pyrrhomyias" OR "Ramphotrigon" OR "Rhynchocyclus" OR "Rhytipterna" OR "Satrapa" OR "Sayornis" OR "Serpophaga" OR "Silvicolitrix" OR "Sirystes" OR "Stigmatura" OR "Sublegatus" OR "Suiriri" OR "Tachuris" OR "Taeniotoxus" OR "Todiostrostrum" OR "Tolmomyias" OR "Tumbezia" OR "Tyrannopsis" OR "Tyrannulus" OR "Tyrannus" OR "Uromyias" OR "Xenotriccus" OR "Xolmis" OR "Zimmerius" OR "Urocynchramus" OR "Artamella" OR "Calicalicus" OR "Cyanolanius" OR "Euryceros" OR "Falculea" OR "Hypositta" OR "Leptopterus" OR "Mystacornis" OR "Newtonia" OR "Oriolia" OR "Philentoma" OR "Prionops" OR "Pseudobias" OR "Schetba" OR "Tephrodornis" OR "Tylas" OR "Vanga" OR "Xenopirostris" OR "Anomalospiza" OR "Vidua" OR "Cyclarhis" OR "Erpornis" OR "Hylophilus" OR "Pteruthius" OR "Vireo" OR "Vireolanius" OR "Zeledonia" OR "Apalopteron" OR "Dasycrotapha" OR "Heleia" OR "Lophozosterops" OR "Sternoptilus" OR "Yuhina" OR "Zosterops" OR "Zosterornis" OR "Agamia" OR "Ardea" OR "Ardeola" OR "Botaurus" OR "Bubulcus" OR "Butorides" OR "Cochlearius" OR "Dupetor" OR

"Egretta" OR "Gorsachius" OR "Ixobrychus" OR "Nyctanassa" OR "Nycticorax" OR "Ptilerodius" OR "Syrigma" OR "Tigriornis" OR "Tigrisoma" OR "Zebrius" OR "Balaeniceps" OR "Pelecanus" OR "Scopus" OR "Bostrychia" OR "Eudocimus" OR "Geronticus" OR "Lophotibis" OR "Mesembrinibis" OR "Nipponia" OR "Phimosus" OR "Platalea" OR "Plegadis" OR "Pseudibis" OR "Theristicus" OR "Threskiornis" OR "Phaethon" OR "Phoeniconaias" OR "Phoenicoparrus" OR "Phoenicopterus" OR "Bucco" OR "Chelidoptera" OR "Hapaloptila" OR "Hypnelus" OR "Malacoptila" OR "Micromonacha" OR "Monasa" OR "Nonnula" OR "Notharchus" OR "Nystalus" OR "Capito" OR "Eubucco" OR "Brachygalba" OR "Galbalcyrrhynchus" OR "Galbula" OR "Jacamaralcyon" OR "Jacamerops" OR "Indicator" OR "Melichneutes" OR "Melignomon" OR "Prodotiscus" OR "Buccanodon" OR "Gymnobucco" OR "Lybius" OR "Pogoniulus" OR "Stactolaema" OR "Trachyphonus" OR "Psilopogon" OR "Blythipicus" OR "Campephilus" OR "Campethera" OR "Celeus" OR "Chloropicus" OR "Chrysocolaptes" OR "Chrysophlegma" OR "Colaptes" OR "Dendrocopos" OR "Dendrocytes" OR "Dendropicus" OR "Dinopium" OR "Dryobates" OR "Dryocopus" OR "Gecinulus" OR "Geocolaptes" OR "Jynx" OR "Leiopicus" OR "Leuconotopicus" OR "Meiglyptes" OR "Melanerpes" OR "Micropternus" OR "Mulleripicus" OR "Nesocittes" OR "Picoides" OR "Piculus" OR "Picumnus" OR "Picus" OR "Reinwardtipicus" OR "Sasia" OR "Sphyrapicus" OR "Veniliornis" OR "Yungipicus" OR "Andigena" OR "Aulacorhynchus" OR "Pteroglossus" OR "Ramphastos" OR "Selenidera" OR "Semnornis" OR "Aechmophorus" OR "Podiceps" OR "Podilymbus" OR "Poliocephalus" OR "Rollandia" OR "Tachybaptus" OR "Diomedea" OR "Phoebastria" OR "Phoebetria" OR "Thalassarche" OR "Hydrobates" OR "Oceanodroma" OR "Fregetta" OR "Garrodia" OR "Nesofregetta" OR "Oceanites" OR "Pelagodroma" OR "Aphrodroma" OR "Ardena" OR "Bulweria" OR "Calonectris" OR "Daption" OR "Fulmarus" OR "Halobaena" OR "Macronectes" OR "Pachyptila" OR "Pagodroma" OR "Pelecanoides" OR "Procellaria" OR "Pseudobulweria" OR "Pterodroma" OR "Puffinus" OR "Thalassoica" OR "Cacatua" OR "Callocephalon" OR "Calyptorhynchus" OR "Eolophus" OR "Lophochroa" OR "Nymphicus" OR "Probosciger" OR "Alipiopsitta" OR "Amazona" OR "Anodorhynchus" OR "Ara" OR "Aratinga" OR "Bolborhynchus" OR "Brotogeris" OR "Conuropsis" OR "Cyanoliseus" OR "Cyanopsitta" OR "Deroptyus" OR "Diopsittaca" OR "Enicognathus" OR "Eupsittula" OR "Forpus" OR "Graydidascalus" OR "Guarouba" OR "Guaruba" OR "Hapalopsittaca" OR "Leptosittaca" OR "Myiopsitta" OR "Nannopsittaca" OR "Orthopsittaca" OR "Pionites" OR "Pionopsitta" OR "Pionus" OR "Poicephalus" OR "Primolius" OR "Psilopsiagon" OR "Psittacara" OR "Psittacus" OR "Pyrilia" OR "Pyrrhura" OR "Rhynchopsitta" OR "Thectocercus" OR "Touit" OR "Triclaria" OR "Agapornis" OR "Alisterus" OR "Aprosmictus" OR "Barnardius" OR "Bolbopsittacus" OR "Chalcopsitta" OR "Charmosyna" OR "Coracopsis" OR "Cyanoramphus" OR "Cyclopsitta" OR "Eclectus" OR "Eos" OR "Eunymphicus" OR "Geoffroyus" OR "Glossopsitta" OR "Lathamus" OR "Loriculus" OR "Lorius" OR "Melopsittacus" OR "Micropsitta" OR "Neophema" OR "Neopsephotus" OR "Neopsittacus" OR "Northiella" OR "Oreopsittacus" OR "Parvipsitta" OR "Pezoporus" OR "Phigys" OR "Platycercus" OR "Polytelis" OR "Prioniturus" OR "Prosopeia" OR "Psephotellus" OR "Psephotus" OR "Pseudeos" OR "Psittacella" OR "Psittacula" OR "Psittaculirostris" OR "Psitteuteles" OR "Psittinus" OR "Psittichas" OR "Purpureicephalus" OR "Tanygnathus" OR "Trichoglossus" OR "Vini" OR "Nestor" OR "Strigops" OR "Pterocles" OR "Syrrhaptes" OR "Rhea" OR "Aptenodytes" OR "Eudyptes" OR "Eudyptula" OR "Megadyptes" OR "Pygoscelis" OR "Spheniscus" OR "Aegolius" OR "Asio" OR "Athene" OR "Bubo" OR "Glaucidium" OR "Ketupa" OR "Lophotrix" OR "Megascops" OR "Micrathene" OR "Ninox" OR "Otus" OR "Pseudoscops" OR "Psiloscops" OR "Pulsatrix" OR "Sceloglaux" OR "Scotopelia" OR "Strix" OR "Surnia" OR "Xenoglaux" OR "Phodilus" OR "Tyto" OR "Aepyornis" OR "Mullerornis" OR "Struthio" OR "Anhinga" OR "Fregata" OR "Leucocarbo" OR "Microcarbo" OR "Nannopterum" OR "Phalacrocorax" OR "Morus" OR "Sula" OR "Crypturellus" OR "Eudromia" OR "Nothocercus" OR "Nothoprocta" OR "Nothura" OR "Rhynchotus" OR "Tinamotis" OR "Tinamus" OR "Apalharpactes" OR "Apaloderma" OR "Harpactes" OR "Pharomachrus" OR "Trogon" OR "Tetrastes" OR "Hesperiphona") AND ("reproductive success" OR "growth" OR "mating success" OR "hatching success" OR "recruitment" OR "fertility" OR "mortality" OR "longevity" OR "body condition" OR "condition" OR "body size" OR "survival" OR "clutch size" OR "breeding success" OR "recruit*" OR "eggs laid" OR "number of eggs" OR "fitness" OR "fledgling*" OR "development") AND ("anthropogenic noise" OR "traffic noise" OR "ambient noise" OR "urban noise" OR "noise pollution")) and Preprint Citation Index (Exclude – Database)