BioDCASE 2026 Task 6 Technical Report: Low-Parameter Detector Ensembles for Bird Counting

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Abstract

This report describes four submissions to BioDCASE 2026 Task 6, Bird Counting. The systems estimate target-species abundance for each evaluation aviary using aggregated detection and acoustic statistics from the full evaluation audio. All systems use the same ARIA-based recipes for Red-billed quelea and Hadada ibis and differ only in the Greater flamingo estimator, which is the dominant source of uncertainty because synchronized flock calling can saturate raw detection counts. Model selection used only the development set and leave-one-out validation; evaluation labels were not used.

1 Task and Data

Task 6 asks participants to estimate the integer abundance of the target species in each evaluation aviary. The main leaderboard contains three species: Greater flamingo, Red-billed quelea, and Hadada ibis. The submitted outputs contain the six main-target evaluation rows specified by the challenge metadata.

2 Feature Extraction

Each aviary-level example was represented by detector-derived and acoustic summary features aggregated over all available clips. ARIA detections were extracted for all main target species, while BirdNET was used as an additional independent detector for Greater flamingo. The feature set includes detection rate, confidence-weighted rate, active file fraction, bout count, bout duration, inter-bout gaps, overlap statistics, and MAAD acoustic indices. No evaluation labels or private evaluation species composition were used.

3 Counting Models

Because the development set provides only two to four labeled examples per target species, the systems use low-parameter recipes rather than high-capacity supervised models. Red-billed quelea uses an ARIA confidence-weighted-rate coefficient model. Hadada ibis uses an ARIA bout-rate coefficient model. Greater flamingo uses four alternative estimators submitted as separate systems to cover the main hidden-set uncertainty induced by flock-call saturation.

4 Submitted Systems

Label	Abbrev.	Development validation
You_PKU_task6_1	aria56	Greater flamingo LOO MAE 0.00; Red-billed quelea LOO MAE 0.00; Hadad
You_PKU_task6_2	stack191	Greater flamingo LOO MAE 0.00; Red-billed quelea LOO MAE 0.00; Hadad
You_PKU_task6_3	zoo252	Greater flamingo LOO MAE 0.75; Red-billed quelea LOO MAE 0.00; Hadad
You_PKU_task6_4	ext600	Greater flamingo LOO MAE 0.25; Red-billed quelea LOO MAE 0.00; Hadad

5 Development Results

Leave-one-out validation was used on the development aviaries for each target species. The most conservative ARIA flamingo model and the stacked flamingo model both obtain 0.00 MAE on the four development flamingo points after integer rounding. The BirdNET balanced model obtains 0.75 MAE, and the BirdNET high-density model obtains 0.25 MAE. Both Red-billed quelea and Hadada ibis obtain 0.00 MAE under the fixed ARIA recipes. These numbers are small-sample development estimates and should not be interpreted as hidden-evaluation guarantees.

6 External Resources

The systems use publicly available pre-trained BirdNET and ARIA detector models as allowed by the Task 6 rules. No external population-count labels were used for count-regressor training. No hidden evaluation labels were used for model tuning.