

**TFRB 25-03-02**  
**March 2025 annual review Turtle Dove AHMM**  
**Management scenarios and technical recommendation**  
**(western and central-eastern flyways) <sup>1</sup>**

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The 2025 technical update for the Turtle Dove AHM mechanism has provided new scientific evidence on the population parameters of the species in both European flyways, western and central-eastern. Such evidence came from the data provided by the Pan-European Common Bird Monitoring Scheme (PECBMS) at a European scale, as well as from field studies in the form of capture-mark-recapture programmes in the western flyway. Additionally, the technical update has also assessed that the three conditions established in 2021 for the resumption of hunting in the western flyway are met, while those established in 2021 for maintaining hunting in the central-eastern flyway are still not met. Based on that information, the scientific consortium makes the following recommendations to the Task Force on the Recovery of Birds (TFRB).

**WESTERN FLYWAY – FULFILMENT OF ALL THREE CONDITIONS**

The recovery of the population size in the first two seasons following the establishment of the temporary hunting suspension, was already reported by Carboneras *et al.* (2024)<sup>23</sup>. The 2025 technical update provides evidence for a third consecutive breeding season with substantial increase<sup>4</sup>. The estimated population size for the last breeding season in 2024 has become the highest since 2009 (15 years) at 2.13 million breeding pairs, with 615,000 more pairs than in 2021, a rise of 40.5 %. The 10-year trend measured by the PECBMS multiplicative slope has similarly improved to “moderate increase” from the previous

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<sup>1</sup> Document prepared in the frame of the service contract with the European Commission “Supporting the recovery of bird species of Annex II of the Birds Directive in non-secure conservation status” (09.0201/2022/886665/SER/D.3) in preparation for the March 2023 meeting of the Task Force on the Recovery of Birds (21-22/03/2023).

<sup>2</sup> Carboneras, C., Cruz-Flores, M., Colomer, M.À., Šilarová, E., Škorpilová, J. & Arroyo, B. 2024a. Turtle Dove Adaptive Harvest Management mechanism - March 2024 Technical update (western flyway).

<sup>3</sup> Carboneras, C., Šilarová, E., Škorpilová, J. & Arroyo, B. 2024b. Rapid population response to a hunting ban in a previously overharvested, threatened landbird. *Conservation Letters*, doi: <https://www.doi.org/10.1111/conl.13057>.

<sup>4</sup> Arroyo B, Cruz-Flores M, Rubio B, Šilarová E, Škorpilová J, Carboneras C. 2025. Turtle Dove Adaptive Harvest Management mechanism. Technical update. Available on CIRCABC.

“moderate decline” of 2021 and the years before<sup>5</sup>. It is unquestionable that the temporary hunting ban is associated with a noticeable increase of the population, perhaps even higher than that predicted by Bacon et al. (2023)<sup>6</sup>. The ban continued in the hunting season of 2024, so the breeding population size in 2025 is expected to augment further, although this is not guaranteed. Indeed, the rate of increase at some point will start to be affected by density-dependent processes and the population size will eventually plateau as it reaches the carrying capacity of the system.

The 2025 technical update considers that the first condition for the resumption of hunting in this flyway, a *population increase of at least 2 years* measured with the PECBMS index (confidence interval with a lower limit > 0.95 and upper limit < 1.05) is fully met.

Similarly, the second condition (an *increase in survival* that leads to a *growth rate ( $\lambda$ )* estimated by the population model that is *reliably equal to or above 1*) is met. This is confirmed empirically by a 5-point increase in the average annual survival rate (0.650 now vs 0.597 before – see technical update for details) estimated for adult birds through CMR programmes and inferred for juveniles (0.362 now vs 0.312 before). When fit in a stochastic population model such as Vortex, these estimates also led to sustained population growth, so the second condition is also considered to be met.

In relation to the third condition (the existence of *credible regulatory and control/enforcement systems* in place at the time when hunting is reopened), the assessment equally concludes that the information provided by the relevant Member States in the flyway is sufficient, thus the condition is equally met.

## WESTERN FLYWAY – MANAGEMENT SCENARIOS

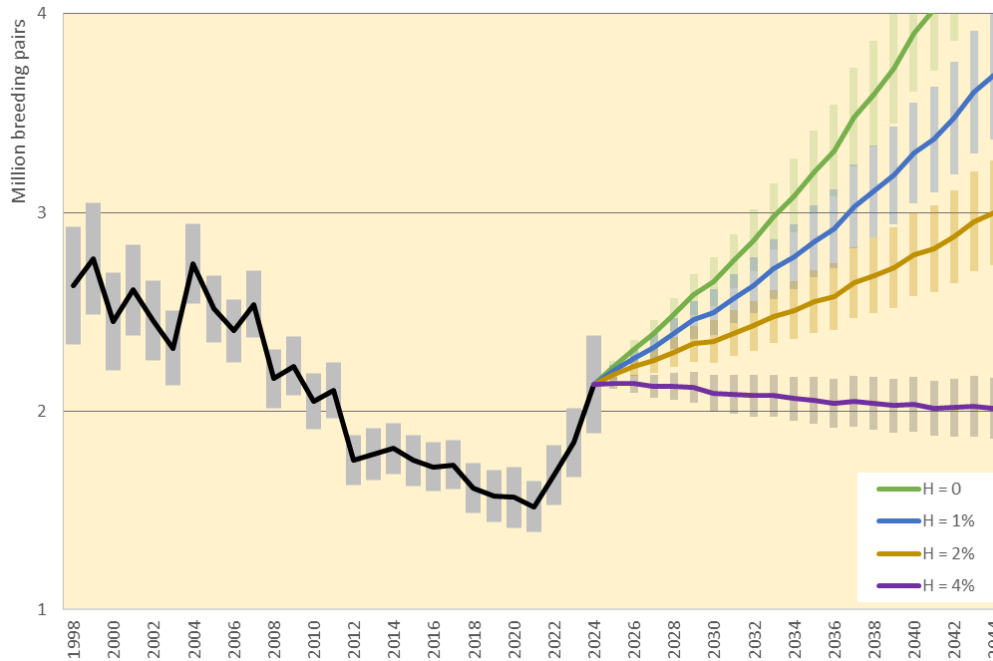
Previous work using population modelling tools (e.g., Carboneras et al. 2024<sup>2</sup>) revealed that only those harvest rates situated below the threshold of 4% would lead to sustained population growth and possibly recovery, apart from scenarios of intermittent hunting. Indeed, Bacon et al. (2023) had estimated the harvest rate leading to population stability under partially compensatory mortality to be 3.7%.

The same modelling exercise from 2023 is shown below simply adjusted to 2024 abundance data (Fig. 5); it illustrates that 2% harvest rate has population effects that are roughly intermediate between zero harvest and 4% hunting, and that 1% is intermediate between 0 and 2%. This allows the possibility to forecast the possible population response to different management scenarios depending on the harvest rate (h).

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<sup>5</sup> Trend calculated assuming normal distribution of SE in both cases

<sup>6</sup> Bacon, L., Guillemain, M., Arroyo, B., Carboneras, C., Fay, R., Sauser, C. & Lormée, H. 2023. Predominant role of survival on the population dynamics of a threatened species: evidence from prospective analyses and implication for hunting regulation. *J Ornithol* 164: 275–285.



Considering a pre-breeding population size in 2025 equivalent to the 2024 post-breeding population size times the annual survival of adults and juveniles respectively, we estimated a post-breeding 2025 population total as the estimated breeding population size in 2025 plus their offspring (2.057 fledglings per breeding female). This would represent some 8.85 million individuals at the end of the breeding season in 2025. Therefore, a harvest rate of  $h = 2\%$  in 2025 would represent approximately 177,000 individuals, and  $h = 1\%$  would mean an offtake of 88,000 individuals. Note that estimating post-breeding population size in the above manner leads to an optimistic estimate, because it considers that no mortality exists between spring and autumn for adults, or between fledging and harvest time for juveniles, and that productivity and annual survival will be maintained at average levels.

Given that the agreed management objective is to achieve population recovery, it follows that neither stability nor decline are acceptable options. Therefore, we must conclude that harvest rate at the time of reopening hunting should be substantially lower than 4%.

A hypothetical harvest of  $h = 2\%$  could bring population growth but this would happen at a relatively slow pace: it would take about two decades on average to reach a population size of 3 million bp, based on the modelling exercise in Fig. 5. An alternative  $h = 1\%$  option might be considered overcautious and potentially difficult to implement (as it would lead to a very small harvest quota to be shared over several countries). Therefore, we suggest for consideration a quota of 132,000 birds for the whole western flyway, which equates approximately to a  $h = 1.5\%$  scenario.

It must be noted that the allocation of any quota should follow the principles and mechanisms agreed by the TFRB in the revised document “Principles and mechanisms for hunting quota allocation, at flyway level, in the context of the recovery of Annex II bird

species in non-secure status” (doc. no. TFRB 24-11-02), available on CIRCABC<sup>7</sup>. The final allocation among MS wishing to retake hunting will be based on the application of the five principles defined in that document. It will be proposed by the scientific consortium to the TFRB on the 4th of march, after consideration of the information provided by the Member States in the yearly Turtle Dove questionnaire. That includes information on the MS’s contribution to population growth, in the form of investment in habitat restoration, rules and efforts to avoid further habitat deterioration, as well as their research, solution-testing and monitoring activities (principle 5 – contribution to population growth, see worked example on the Turtle Dove in the quota allocation document).

#### CENTRAL-EASTERN FLYWAY

For the central-eastern flyway, the evidence provided by the new data from the Pan-European Common Bird Monitoring Scheme (PECBMS) unfortunately confirmed the continuation of the decline and a worsening of the population status, both already observed in the 2024 update. Following recalculation with the latest data available, the population size is shown to have reached its lowest level of the entire time series in 2024, after suffering a 46% decline since 2005 (19 years). This is totally unlike the situation in the western flyway, which is currently growing at an average 12% every year.

Despite the recommendation to not allow hunting in 2022, 2023 and 2024, all the Member States that can allow hunting of turtle dove in this flyway according to the Birds Directive have reported some harvest of the species (except for RO in 2022 and AT in 2024). This occurred in reportedly smaller numbers, but the only explanation to the observed continuation of the decline is that the actual harvest (potentially inaccurately reported) must be above the rate that the population is able to sustain with its current (unknown) survival and (unknown) productivity. It is relevant in this context that from 2021 one of the agreed conditions to maintain hunting was to develop research programmes that would allow to obtain demographic information sufficient to adequately assess the population outcomes of different harvest scenarios, something that has not yet occurred.

Given the aggravated situation, it seems essential to repeat and underline the same technical recommendation for the central-eastern flyway made in previous years, that is, to maintain, and enforce, zero harvest in the hunting season of 2025. This decision should remain in place until there is evidence of recovery and similar conditions to those conditions agreed for the western flyway are met in this flyway too:

1. A population increase of at least 2 years measured with the PECBMS index (confidence interval with a lower limit > 0.95 and upper limit < 1.05);
2. Available flyway-specific survival data, allowing to develop a bespoke population model, indicating a growth rate ( $\lambda$ ) reliably equal to or above 1 (with the risk of decline lower than 15%);

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<sup>7</sup> Arroyo B, Carboneras C, Rubio B. 2024 Revised document – Principles and mechanisms for hunting quota allocation, at flyway level, in the context of the recovery of Annex II bird species in non-secure status. Document N°: TFRB 24-11-02, 08 November 2024. Available on <https://circabc.europa.eu/ui/group/e21159fc-a026-4045-a47f-9ff1a319e1c5/library/7af5a60f-fc63-4ebb-af10-5b236665105a/details>

3. Credible regulatory and control/enforcement systems in place at the time when hunting is reopened.

The example of the western flyway has shown that the species may potentially react quite quickly to the appropriate action, and that population recovery may be possible in a relatively short time frame, hence the zero-quota management option must not necessarily be long-lasting.