Hunting and Conservation of Turtle Dove in Europe

Towards a recovery in both flyways?

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FACE - European Federation for Hunting and Conservation

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Take home messages

For the first time, an increase in the breeding populations of both the Western and Central/Eastern flyways has been recorded. This is a significant milestone as the objective of the International Action Plan for the species is to halt the decline European Turtle Dove throughout most of its range by 2028.

Western Flyway:

- The Turtle Dove population increased over the past three years in the Western flyway, to the point where the agreed conditions have been met to reopen hunting in 2025.
- A low-level harvest rate of 1.5% was set, based on the past years' population modelling. This is at the lower end of the rate considered to be sustainable.
- Conditions for monitoring and enforcement of hunting regulations were also met.

Central and Eastern Flyway:

- An increase in the Turtle Dove breeding population in the Central/Eastern flyway in spring 2024 has been detected with a monitoring data update in May 2025.
- Before this increase, harvest had been considerably reduced (by more than 50%) for three hunting seasons.
- Further harvest reductions took place in autumn 2024, corresponding to a 90% reduction compared to the baseline, or to a harvest rate of about 3.9%.
- Both these levels were suggested to be sustainable by the available modelling work.

The reasons for this outcome may not be as simple as they seem because the Turtle Dove had been increasing in some Member States prior to hunting restrictions. Regardless, these signs of recovery in both flyways are a much welcome sign of effective conservation efforts, to which the hunting community has been dedicated for years, including habitat restoration, provision of water in times of drought, and more recently, in implementing harvest restrictions.

Introduction

In 2018, the Turtle Dove EU Action Plan (Fisher et al., 2018) identified three main threats to the species: habitat loss, illegal killing, and unsustainable hunting levels. The high-level objective of the EU Action Plan is *"To halt the population decline of the European turtle-dove throughout most of its range, preparing the way for an increase in population sizes within each flyway during the period of the next Action Plan (2028-2038)".*

To meet it, several objectives were identified, mainly: good quality habitats in breeding and wintering grounds, the eradication of illegal killing, and sustainable harvest level.

In 2019, the European Commission launched the Turtle Dove EU Adaptive Harvest Management to answer the need to ensure sustainability of hunting as required by the EU Action Plan.

In 2021, the EU Adaptive Harvest Management resulted in the implementation of a hunting moratorium in the 4 Member States in the Turtle Dove Western flyway (France, Spain, Portugal, and the northern part of Italy), and in the implementation of 50% harvest reductions in the Central/Eastern flyway Member States (Italy, Greece, Malta, Cyprus, Romania, Bulgaria, Austria), which in practice, resulted in reductions of approximately 70%.

Between 2021 and 2024, the moratorium has been in place in the Western flyway and, in the Central/Eastern flyway, the 50% harvest reduction implemented between 2021 and 2023 was further decreased by 50% in 2024, resulting in a total harvest reduction of around 90%.

Now, in 2025, new developments in the Western flyway allow for the reopening of hunting, with a strictly regulated and very low quota, and an increase in the Central/Eastern flyway was detected for the breeding population in spring 2024.

What's happening in the Western flyway ?

The population trend update

In the Turtle Dove Western flyway, the population has increased following the moratorium implemented by Member States (France, Spain, Portugal, and northern Italy) in 2021. Figure 1 shows a population increase for the three years following 2021.

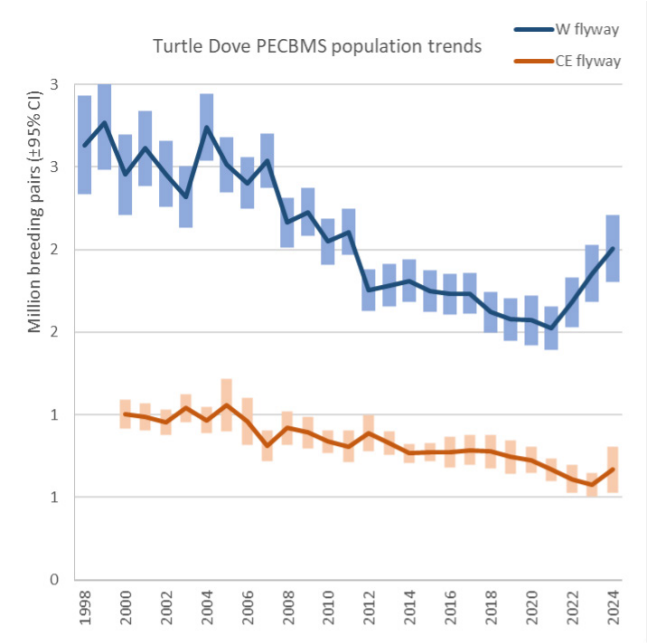

Figure 1
Turtle Dove population trends per flyway, update 2025 (Arroyo et al., 2025).

As a result of this increase, the latest population 10-year trend (2015-2024) is now indicating an increase but qualifies as stable (as the lower confidence interval is below 1), see Figure 2. This trend serves as a reference for the population trend, and is updated each year by PECBMS, in the framework of the Turtle Dove Adaptive Harvest Management. The yearly updates are visible in Figure 2.

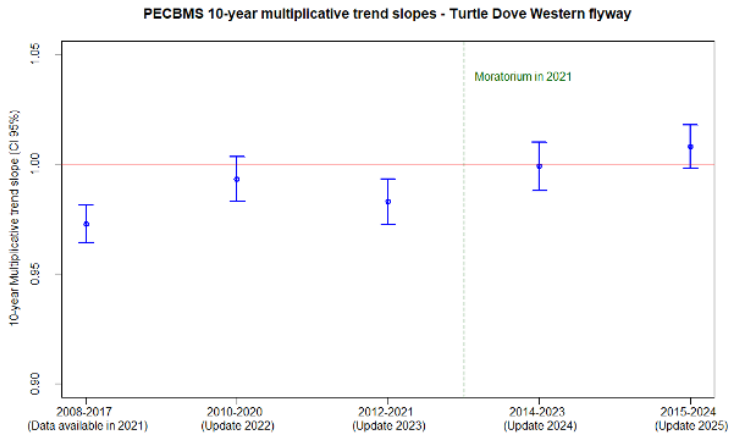

Figure 2
PECBMS'Turtle Dove 10-year population trends for the Western flyway, as per each yearly update in the framework of the Turtle Dove Adaptive Harvest.

Importantly, the 10-year trend available in 2022, which covered the 10 years before the hunting moratorium (2010-2020) showed population stability, as per PECBMS criteria. This stability was occurring with the past high harvest levels.

In addition, when looking at national level, we can see that the population was stable in Spain for about the same (2013-2018) period (Moreno-Zarate et al., 2020).

More specifically, according to the study, Turtle Dove numbers in Spain increased between 2000 and 2004, declined between 2004 and 2013 and then stabilized, with signs of increase, between 2013 and 2018, as shown in Figure 3. Monitoring also shows that the Turtle Dove population has been stable between 2005 and 2009 (SEO BirdLife, SACRE 2015).

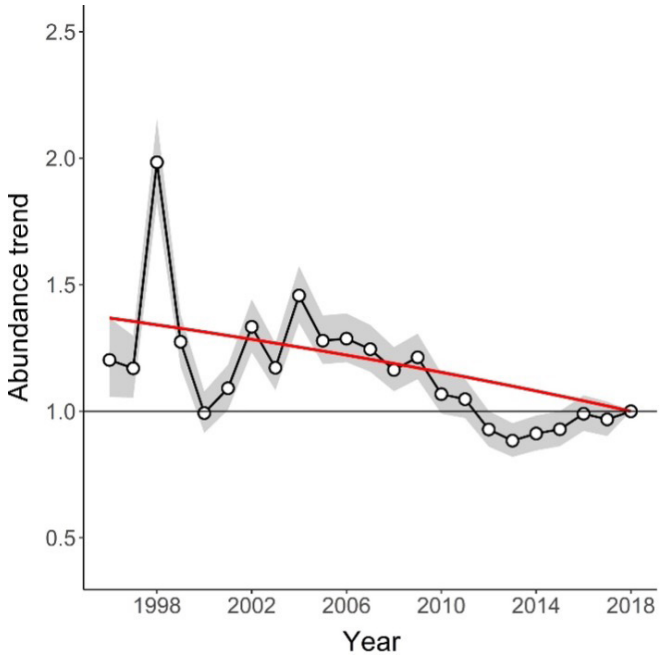

Figure 3
Population trend for the Turtle Dove in Spain between 1996 and 2018 (Moreno-Zarate et al., 2020).

In Portugal, the population increase started before the moratorium, as the Turtle Dove 10-year population trend covering the period just before the moratorium (2012-2021) was increasing (SPEA's CAC report 2022). It was also increasing for the period 2013-2022 (SPEA's CAC report 2023) and then became uncertain for the period 2014-2023 (SPEA's CAC report 2024).

The population trend in Portugal before the moratorium can be seen in Figure 4.

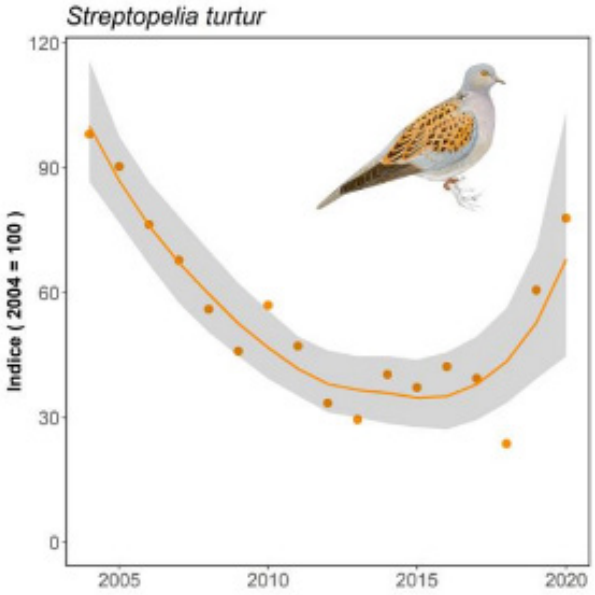

Figure 4
Turtle Dove population trend in Portugal before the moratorium (SPEA's CAC report 2021).

While the moratorium certainly played a role in the population increase, the case of Spain and Portugal highlight the complexity of bird population dynamics as numerous factors influence the trends. These cases show that the population was stable in Spain and started to increase in Portugal while high harvest levels were taking place.

Reopening of hunting

This year, after five years of work in the framework of the EU Task Force on the Recovery of Birds, and four years of moratorium in the Turtle Dove Western flyway, the European Commission gave the green light for the reopening of hunting as all criteria are being met.

The criteria are a population increase, which is the case since 2021, a positive growth rate estimated by the model, and the implementation of regulatory systems to ensure compliance with the Adaptive Harvest Management's requirements.

The reopening can occur with a strictly regulated quota of 1.5% of the post-breeding population. The size of the post-breeding population is estimated at around 8.31 million individuals.

This very low harvest rate was identified as sustainable and precautionary, based on the last five years of scientific work and research on the Turtle Dove in the Western flyway, as represented in Figure 5.

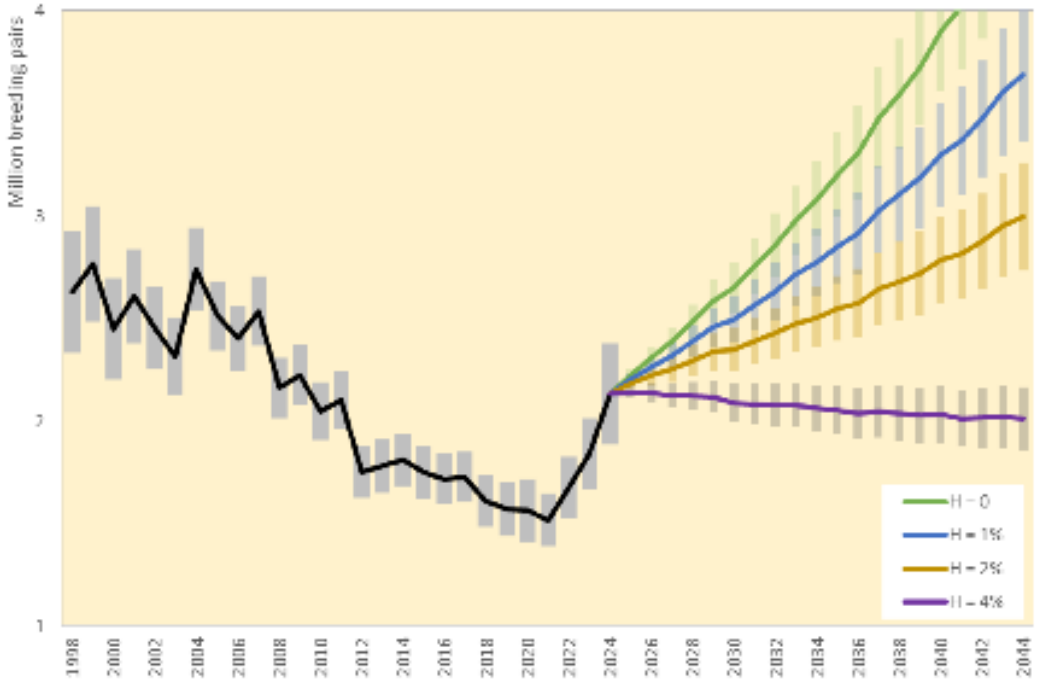

Figure 5
PECBMS'Turtle Dove 10-year population trends for the Western flyway, as per each yearly update in the framework of the Turtle Dove Adaptive Harvest.

The quota is deemed precautionary and is distributed between the four countries located in the Western flyway according to the European Commission's quota allocation methodology agreed by Member States.

This methodology mainly rests on historical harvest levels to distribute harvest to the countries, with an additional step which can reduce the share of harvest for a given country implementing below average (compared to other Member States) actions in contribution to recovery.

This is the case for the 3 northern regions of Italy, but not for Spain and France which are the 2 countries with most investments in favor of the Turtle Dove recovery in the Western flyway.

Country	Historical harvest	Contribution to recovery	Final harvest
ES	81%	No restriction	106920
FR	8%	No restriction	10560
PT	10%	Not specified*	13200
IT	1%	-30%	924
Total			131604

Table 1
Distribution of the quota between Spain, France, Portugal, and Italy (3 regions) according to the European Commission's methodology. **Portugal was late in expressing their intention to use their share of the quota. Hence, this step has not been conducted for Portugal yet.*

FACE welcomes the science-based reopening of hunting, a milestone in ensuring sustainable hunting in the EU. Launched in 2019 by the European Commission, the Turtle Dove EU Adaptive Harvest Management answered the need to ensure sustainability of hunting as required by the EU/CMS Turtle Dove Action Plan.

This is important, as hunters across Europe play a vital role in Turtle Dove conservation (e.g., France, Spain), leading longstanding efforts to restore, manage, and preserve high-quality habitats, the most critical factor for the species' conservation.

The reopening highlights that sustainable hunting, which includes year-round management, and conservation go hand in hand.

What's happening in the Central/Eastern flyway?

Harvest reduction

Since 2021, strong harvest reductions took place in the Central/Eastern flyway Member States (Italy, Greece, Malta, Cyprus, Romania, Bulgaria, Austria), as can be seen in Figure 6.

These reductions followed the recommendation to reduce harvest by 50% in 2021, and, in practice, resulted in reductions of 72% in 2021, 74% in 2022, and 75% in 2023.

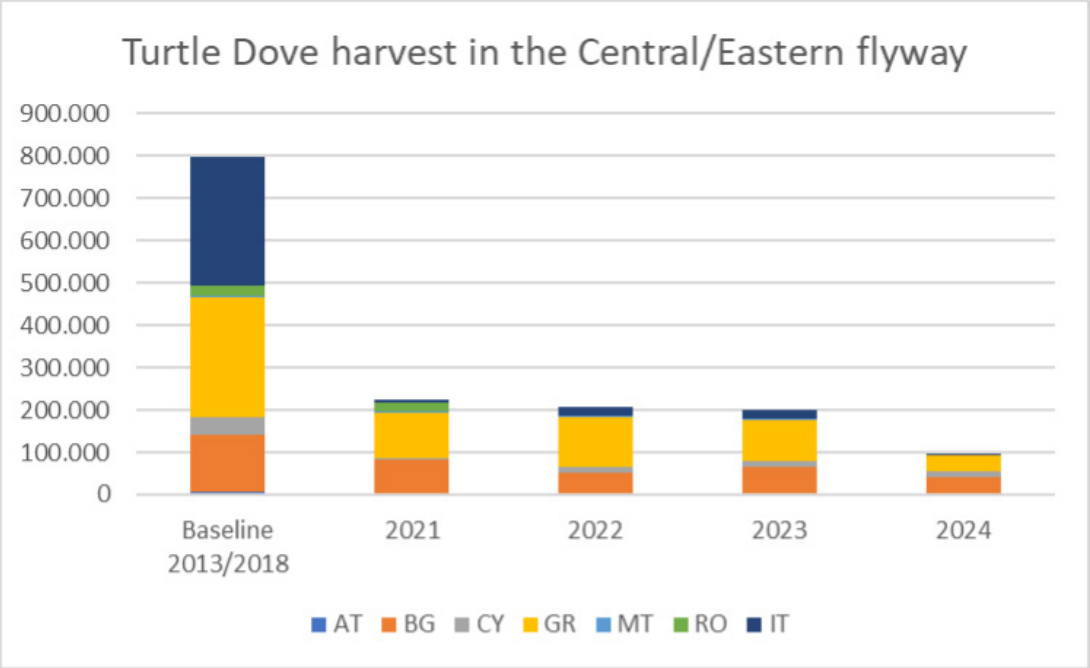

Figure 6
Harvest reported by member States in the Turtle Dove Central/Eastern flyway, in the framework of the Adaptive Harvest Management, using the reporting period 2013-2018 as a baseline.

Harvest reports from countries in the Central/Eastern flyway show that further efforts to reduce harvest took place in 2024, with a further 50% reduction resulting in a c.90% decrease compared to the baseline 2013-18.

In the case of Italy, only two regions hunted the Turtle Dove in 2024, explaining the very low harvest figure. More detail is presented in Table 2.

Country	Baseline (2013-2018)	Reported harvest 2021	Reported harvest 2022	Reported harvest 2023	Reported harvest 2024	Comparison from baseline in 2024
AT	7.800*	100	Unknown**	Unknown**	3	-100%
BG	134.455	82.486	50.599	65.037	39.860	-70%
CY	39.015	2.250	15.756	13.699	16.039	-59%
GR	285.600	109.860	120.000	96.198	36.000	-87%
IT	304.140	8.297	19.929	19.149	2.801	-99%
MT	4.099	500	949	2.000	1.870	-54%
RO	21.616	22.376	0	1.710	0	-100%
Flyway total	796.725	217.581	207.233	185.198	96.573	-88%

Table 2
Harvest per country in the Central/Eastern flyway since the implementation of the Adaptive Harvest Management in 2021 (Rubio et al., 2025).
**Includes a majority of Woodpigeons*
***Unknown, but scarce.*

In 2023, the population modelling work conducted by the European Commission showed that reducing the harvest to 33% of the harvest baseline (2013-18) in the Central/Eastern flyway would lead to population stability, see Figure 7.

The current available data for 2024 shows the harvest has been reduced to around 10% of the harvest baseline. Given the lack of new data in the Central/Eastern flyway, this population model was not updated since 2023.

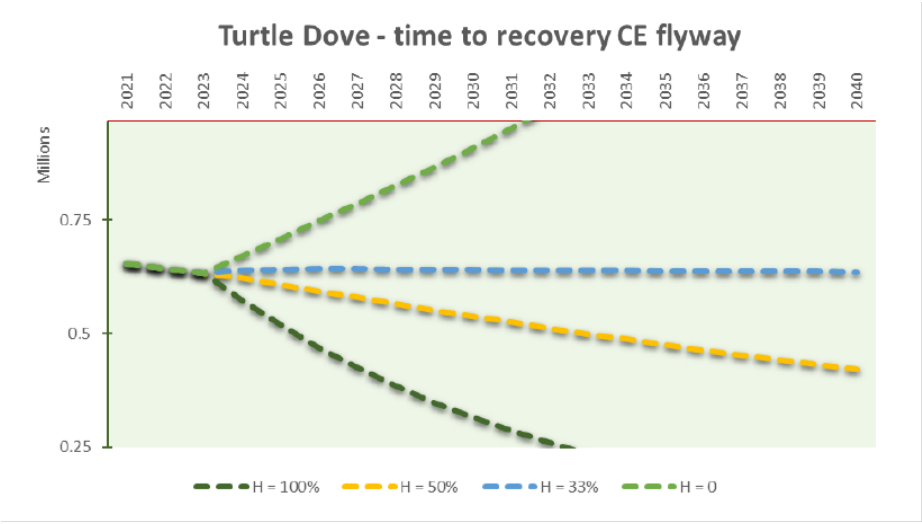

Figure 7
Predicted Turtle Dove population trajectories in the Central/Eastern flyway per harvest management scenarios, showing that harvest between 0 and 33% of the baseline would be sustainable (March 2023 Technical update - Carboneras et al., 2023).

Recent modeling work produced for the Western flyway shows that harvest rates up to 3.7% or 4% of the post-breeding population would be sustainable.

This should be regarded as a precautionary level as recent work by the European Commission on comparing the trend projection model with the actual past observed trend revealed that the model overestimates, to some extent, the impact of hunting.

With the latest estimate of 670,000 breeding pairs (so a post breeding population 2024 of around 2,7 million individuals), the current available data for 2024 shows the harvest in the Central/Eastern flyway would correspond to a harvest rate of around 3.9%.

To summarize, according to the current modeling work available:

- A reduction of harvest to between 0 and 33% of the baseline in the Central/Eastern flyway should be sustainable; the harvest in 2024 has been reduced to about 10% in the Central/Eastern flyway.
- Harvest rates up to 3.7% or 4% of the post-breeding population were identified as sustainable in the Western flyway; the harvest rate in 2024 was about 3.9% in the Central/Eastern flyway.

While this low harvest happens, hunters in these EU countries spend significant efforts in habitat improvement for the Turtle Dove and biodiversity (e.g., Greece, Italy).

As loss of habitat is the main driver of population and biodiversity decrease in the EU and beyond, targeted actions implemented by hunters on the ground such as hedge plantations, provision of water in dry habitats, creation of seed rich plots or seed crops left unharvested, and much more, are crucial for the improving the habitat for wildlife.

Flyway trend updates

Contrary to what is observed in the Western flyway, no clear increase in population is visible. However, an increase was detected in 2024 (see Figure 8), after three years of harvest reduction (2021, 2022 and 2023).

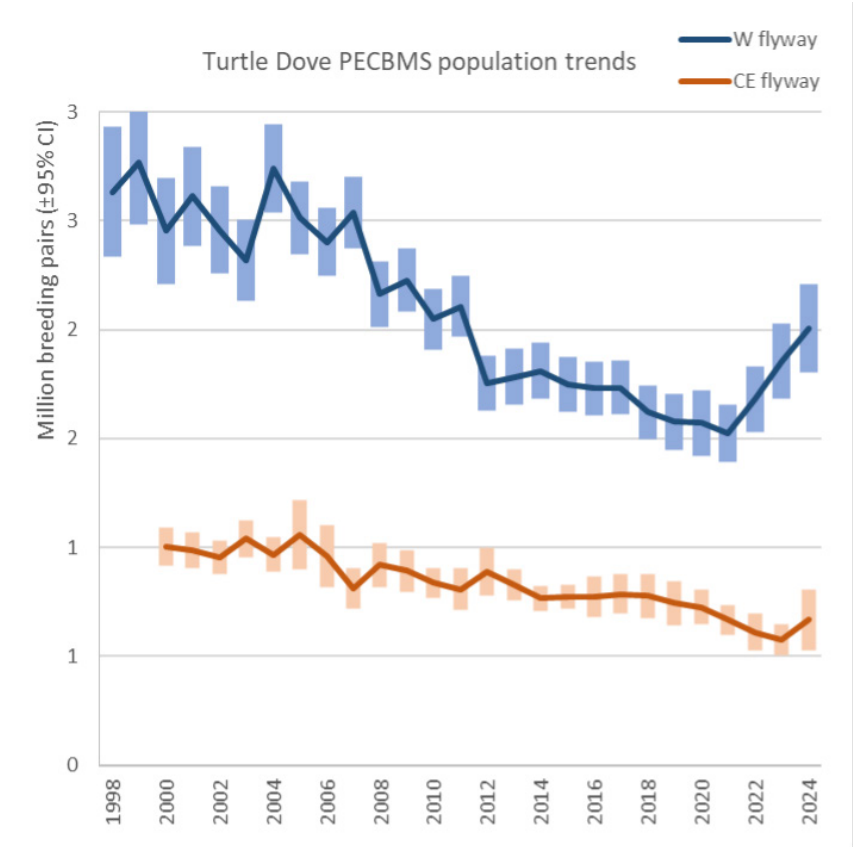

Figure 8
Turtle Dove population trends per flyway, update 2025.

While the 10-years trends have worsened after the strong reductions in hunting, see Figure 9, stabilization may have been detected in 2024, but the trend still does not qualify as stable.

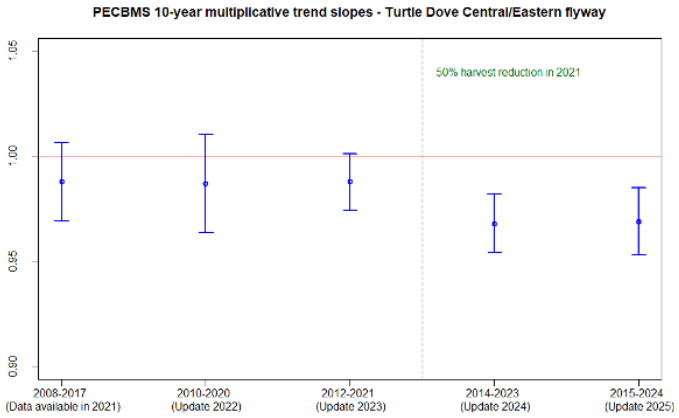

Figure 9
PECBMS'Turtle Dove 10-year population trends for the Central/Eastern flyway, as per each yearly update in the framework of the Turtle Dove Adaptive Harvest Management.

The further drastic harvest reductions in the hunting season 2024 took place after the detected increase in spring 2024. Therefore, the increase in breeding population detected in 2024 happened following the 50% reduction recommended in 2021 and implemented for the hunting seasons 2021, 2022, and 2023.

As a reminder, the 50% reduction originally recommended by the Task Force in 2021 aimed at reducing by half the identified harvest rate baseline (2013-18) of 18%, so to 9%, which was achieved in the pas hunting seasons before the further reduction in 2024.

Should this increase be confirmed in the following years, this case would represent a good example of population recovery while maintaining low harvest rates and hunters' interest. Hunting is much more than just off-take, it is a year-round activity providing significant benefits to habitats and wildlife. Hunters have always been leaders in the conservation and improvement of quality habitats, enhancing biodiversity in the EU.

Therefore, maintaining hunters' interests in species requiring conservation efforts can be beneficial. The current situation suggests that other factors, such as farming intensification and loss of habitats, might be the prominent drivers of population change.

National level trends

Notwithstanding the flyway management approach, it is worth noting that, according to the PECBMS data up to 2017 (Brlík et al. 2021), the only countries in the Central/Eastern flyway in which the Turtle Dove has been increasing (10-year trends) are Greece, Bulgaria, and Romania, which are countries in which the species is huntable, see Figure 10.

However, this data should be updated to assess what happened at national levels in recent years.

Figure 10
PECBMS national trends in the Turtle Dove Central/Eastern flyway up to 2017 (Brlík et al. 2021).

Interestingly, these increases in Greece, Bulgaria and Romania occurred at the same time as the high past harvest levels.

Importantly, the Central/Eastern flyway data updated in May 2025 with the data from Greece and Romania resulted in a increase for the breeding population in 2024, indicating good trends in these countries, as was already the case between 2005/2007 and 2017 (see Figure 10). Hence, it is likely that the Turtle Dove in Greece and Bulgaria has been increasing over the last two decades, but this should be confirmed with the national complete dataset.

When looking at national level, Italy is an interesting case. In Italy, the Turtle Dove has been increasing between 2000-2011(+1.2% per year, +10% 2000-2011) (Campedelli et al. 2012). It was then assessed as stable for the period 2000-2014 and decreasing for the period 2000-2023, see Figure 11.

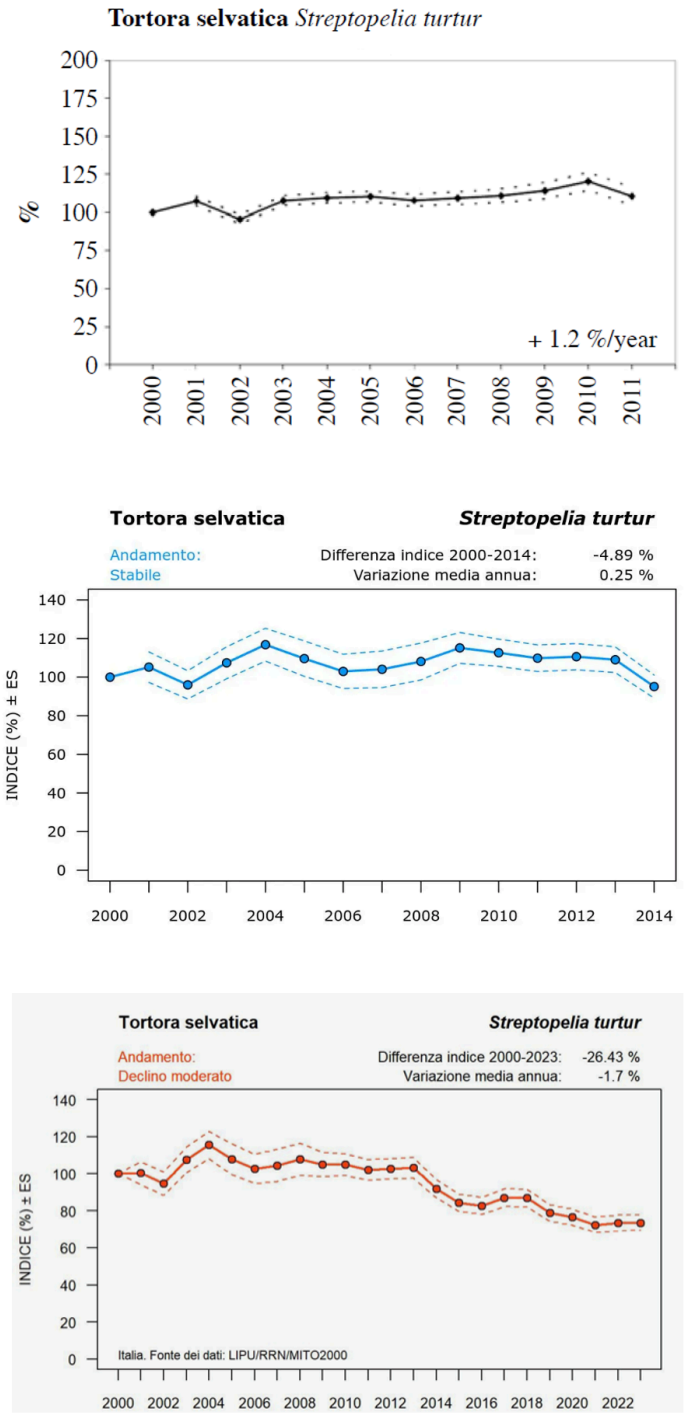

Figure 11
Turtle Dove population trend in Italy for the periods 2000-2011, 2000-2014 and 2000-2023.

This shows that a population change occurred around 2013, with the trend subsequently changing from increasing, to stable, to decrease.

However, there is no reason to believe the harvest increased during that period in Italy and other countries of the flyway, rather, the opposite is more probable (as indicated by Member States reporting under the Birds Directive for the period 2013-18).

The cases of Italy, Greece and Romania suggest that while harvest reductions may benefit the Turtle Dove population in the Central/Eastern flyway, hunting appears unlikely to be the main driver of population change, as the populations in these three countries have been increasing (at least up to 2017) with the high past harvest levels.

This points out to the fact that other factors than hunting (e.g., agriculture and loss of habitat) appear to be more important drivers in national Turtle Dove breeding population change.

Habitat management

As for other farmland bird species, the main issue in the conservation of the Turtle Dove is the loss of quality habitat for foraging and breeding. Many non-huntable species of agricultural lands are experiencing similar declines, e.g., see Figure 12 showing similar large decline in the 80's followed by moderate decline since then for several farmland species, including Turtle Dove.

These trends demonstrate on their own that a global issue linked to habitat loss through farming intensification is the main driver of population decrease for a large array of wildlife, not just birds, and this has nothing to do with hunting.

On the contrary, hunters have long been the only, or part of the few stakeholders working on the ground for decades to maintain favorable habitats, with a focus on maintaining game populations, but benefiting all biodiversity.

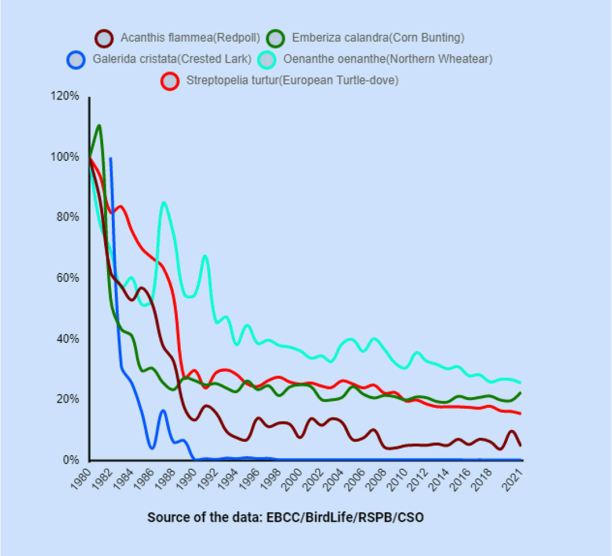

Figure 12
Large decline in the 80's followed by moderate decline since then for Redpoll, Corn Bunting, Crested Lark, Northern Wheatear, and Turtle Dove.

This year, the European Commission expressed recommendations regarding habitat conservation and research for the Turtle Dove.

European Commission's recommendations for research and habitats (Rubio et al., 2025b):

Research and monitoring:

- Carry out comprehensive surveys/census to estimate the breeding population size.
- Maintain (or expand) Capture-Mark-Recapture programmes, which allow long-term assessment of variations in survival.
- Carry out research on productivity

Habitat:

FARMLAND	WOODLAND	BOTH
Retain / create patches of shrub or areas with trees	Open the canopy through thinning (if dense)	Increase the mixing of farmland and woodland, i.e., augment the ecotone between them
Ensure the provision of areas with high food availability, accessible for turtle doves, i.e., herbaceous grasslands with low vegetation height	Create clearings and prevent their subsequent encroachment	Retain or recover elements of heterogeneity in the landscape
Maintain grassy margins between farmland plots	Keep weedy tracks	Combine and integrate patches of farmland, grassland and woodland in a mosaic pattern
Keep weedy tracks	Maintaining woodland clearings through herbivory	
	Maintain extensive herbivory (particularly within woodland)	

Conclusions

Significant progress has been made in the framework of the Turtle Dove EU Adaptive Harvest Management launched by the European Commission five years ago.

The most significant one is the research on population modeling which enabled an informed decision to reopen hunting in the Western flyway with a strictly regulated, very low and precautionary harvest, after 4 years of moratorium. The recent increase in the Central/Eastern flyway is also a good sign. This milestone outcome in harvest management in the EU highlights the significant benefits of science-based decision-making and demonstrates that species conservation and hunting go hand in hand.

As this management is an adaptive process, the monitoring and adaptation of policy measures will continue in future years, to learn about population dynamics and ensure sustainable harvest of Turtle Doves.

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