

ANALYSIS OF HUNTING BAG DATA OF WOODPIGEON (*Columba palumbus* L.) IN HUNGARY

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ABSTRACT

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The European population of the Woodpigeon has increased significantly over the last two decades. In line with this trend, a significant increase has been observed in the Hungarian population since 2006, and in parallel, the hunting bag data of the species has also started to increase. With the increasing hunting bag data, the national centre point of bagging has not changed, so 67.9% of the Hungarian bagging recorded between 1995 and 2022 takes place in Pest, Jász-Nagykun-Szolnok, Bács-Kiskun, and Csongrád-Csanád counties. In order to reduce the increasing damage to agriculture caused by the growing populations of the species, out-of-season bagging of the Woodpigeon was first authorised in Hungary in 2014, and was requested by the game management units from the regional hunting authorities. Out-of-season Woodpigeon baggings accounted for 10% of annual hunting bags by 2022. It is clear that the Woodpigeon population continues to grow even with the current hunting utilisation, and it is also clear that the growing domestic population will become more economically important each year due to the damage caused to agriculture. All this, together with the increasing urbanisation tendency of the species and the change in migration patterns, is creating new challenges for game managers, for which domestic game management must be prepared, despite the fact that the damage caused by the Woodpigeon is not considered as game damage.

KEYWORDS: Columbidae, thinning, population dynamics, agricultural damage, out-of-season baggings

1. INTRODUCTION

The Woodpigeon is a semi-migratory species, with populations in western and northern Europe wintering west and south of the 0°C isothermal line (GLUTZ & BAUER 1980, SAARI 1997). The Hungarian breeding population migrates to the Mediterranean wintering grounds in late October and early November. Based on the results obtained during ringing surveys of Woodpigeons in Hungary, their route (n=29) and destination is Italy, including Sardinia (n=16) and southern France, and Corsica (n=13) (BANKOVICS 2001, FARAGÓ, 2001, 2009, 2015).

Increasingly mild winters and the plastic, adaptive character of the species result in an increasing number of overwintering populations in our region, especially in populated areas (FARAGÓ, 2009).

The European population was estimated to be between 7.7 and 15 million pairs between 1990 and 2000 (TUCKER & HEAT 1994, SAARI 1997, BIRDLIFE INTERNATIONAL 2000), while the estimated EU-25 population of the species was 10.25 million pairs (HIRSCHFELD & HEYD 2005). The species' populations are increasing permanently, and the range of the area is also expanding in suitable areas throughout Europe. This was particularly evident in northern Europe and was mainly associated with warmer periods (SATTLER 2020).

Following this increase, the European population was estimated at 9–17 million pairs at the beginning of the new millennium, with steady or increasing population dynamics in each country (BIRDLIFE INTERNATIONAL 2004). Today, the nesting population size is

estimated to be between 25.5 and 36.5 million pairs, according to the most recent data, with still increasing dynamics (BIRDLIFE INTERNATIONAL 2023). The results show a significant increase in the population, even with lower estimates, of almost four times since the mid-1990s. In addition, the species is not only conquering new natural habitats, but is also becoming more frequent and abundant in urban environments. This process started in Western Europe (FARAGÓ, 2015) but has been known in Hungary for three decades (JUHÁSZ 1985), and the urbanisation process is nowadays becoming more and more significant in Hungary (AMBRUS 1996, JUHÁSZ & VARGA 2019, BANKOVICS 2019). The nesting population in Hungary was estimated to be 77–110 thousand pairs between 1999–2002 (HADARICS & ZALAI 2008), which increased 3-4 folds by 2021–2022, reaching 200–300 thousand breeding pairs in Hungary, according to the lowest estimates of the BirdLife Hungary's Monitoring of Common Birds (MME) programme. The maximum of these estimates for 2021–2022 will reach 440,000 pairs of domestic breeders, noting that, similar to the world population, the Hungarian population has been growing strongly since the turn of the millennium (MME 2023). In addition to the above-mentioned population growth, migration and wintering patterns have also changed significantly due to the increasing number of wintering Woodpigeons in Hungary, especially within settlements (FARAGÓ *et al.* 2019). Unfortunately, no estimation of the development of wintering populations in Hungary is available so far.

As mentioned above, the Woodpigeon is classified as a NON-SPEC (SPEC 4) species (TUCKER & HEATH 1994), i.e., a species with favourable, stable protection status. Its native populations are not threatened and are increasing, so no protective action is required. It can, therefore, be hunted throughout Europe, as in Hungary (15 August-31 January) (OMVK 2023). It prefers to feed in agricultural areas, and during migration, it particularly favours these areas, which is when it is hunted. However, the above-mentioned population increase and the change in migration and wintering patterns pose new challenges for game managers in Hungary and abroad. Research in wildlife biology can provide answers to these challenges, which can also be of practical use to managers if we can understand the processes that shed light on the most important questions through the feeding character of the species, namely where the areas are most vulnerable to damage, which period the most critical for the species in each crop is, and of course the extent to which these birds are damaged.

2. MATERIAL AND METHOD

The hunting bag data was based on the data summarised in the National Game Management Database (hereafter NGMD), based on the game management reports of the hunting license holders for the given hunting year. From the publications of the NGMD, we evaluated the hunting bag data of the Woodpigeon from 1995 to 2022 by year and by county. These data included the total number of Woodpigeons killed in each hunting year. In addition, based on derogation reports prepared and published annually in accordance with European Union requirements, we also summarised the domestic bagging data outside the hunting season, which, following Hungary's accession to the European Union, are available from 2004 to 2022, also for each county. An important additional information to this data is the method of bagging and the reason for bagging. The above data allow us to assess the spatial and temporal patterns of bagging and unseasonal bagging at a national scale.

A detailed, farm-level study was carried out in Jász-Nagykun-Szolnok County, for which the Department of Agriculture of the Government Office of Jász-Nagykun-Szolnok County provided us with data on out-of-season bagging by game management unit for research purposes. The data were mapped using ArcGIS 10.3 software.

The maps showing the annual hunting bags and the out-of-season baggings were prepared on a county level, while the out-of-season baggings data for Jász-Nagykun-Szolnok county were also shown on a finer scale by game management unit (nine game managers in total).

3. RESULTS AND DISCUSSION

Based on the results of our study, it can be concluded that the main focus of Woodpigeon bagging in Hungary during the period under study was clearly on the counties of the Great Hungarian Plain. The number of bagged Woodpigeons, however, showed a significant increase during this period. In 1995, 2747 Woodpigeons were bagged in Hungary, of which the most important counties were: Pest (25%), Bács-Kiskun (17,2%) and Békés counties (13,2%). In 2022, 14274 Woodpigeons were in hunting bags in the country, of which Pest (40.3%), Csongrád-Csanád (17.2%), Bács-Kiskun (15.8%) and Jász-Nagykun-Szolnok counties (6.8%) had the largest shares. It is worth noting that from 1995 to 2022, the Hungarian hunting bag data for the Woodpigeon show an increase of 519.6%, i.e., a more than fivefold increase in the domestic hunting bag of this species. This growth rate is almost the same as the growth rate estimated by BirdLife Hungary for domestic breeding pairs. However, the 14274 specimens bagged in 2022 show a utilisation rate of only 1.6% compared to the 440000 breeding pairs estimated for that year, i.e., 880000 adult specimens.

Looking at the variation of the domestic hunting bag data of the Woodpigeon, it can be observed that in the years between 1995 and 2005, with a lower fluctuation, an average of 2361 pigeons were bagged annually. The significant change in the hunting bag data started in 2006, when, with the exception of 2010, there was a considerable increase. Compared to the previous period, between 2006 and 2017, the average increase in Woodpigeon bags in Hungary was 125.3%. However, the most significant change from 2017 was in 2018, when there was a 70.7% increase in one year, and although the hunting bag data for 2020 fell by 12.9% compared to the previous year, there is still a significant increase until 2022. In 2022, 23% more Woodpigeons were bagged compared to 2018 (**Figure 1**).

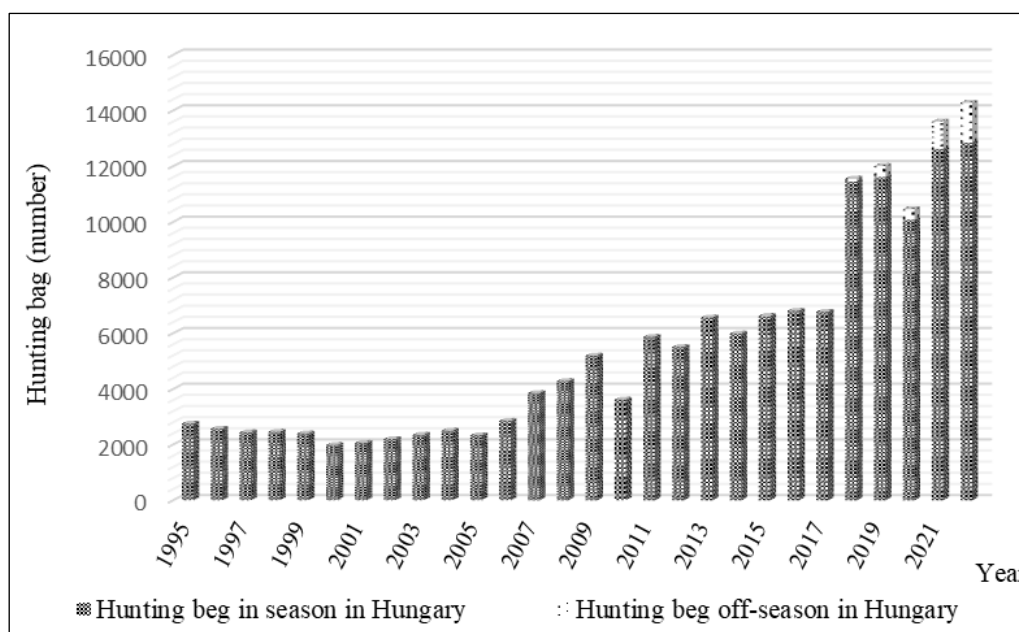
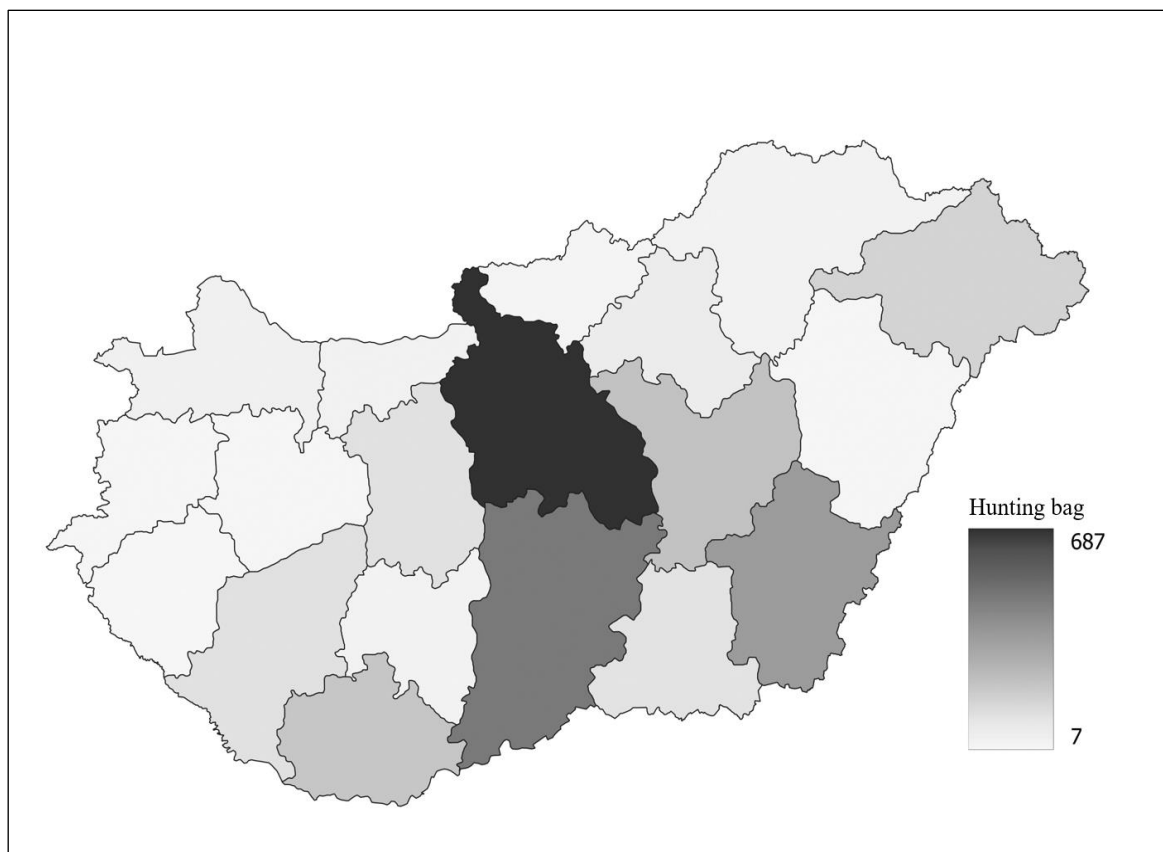


Figure 1. Changes in the distribution of Woodpigeon hunting bags in Hungary in the hunting season and outside the hunting season in the years 1995–2022

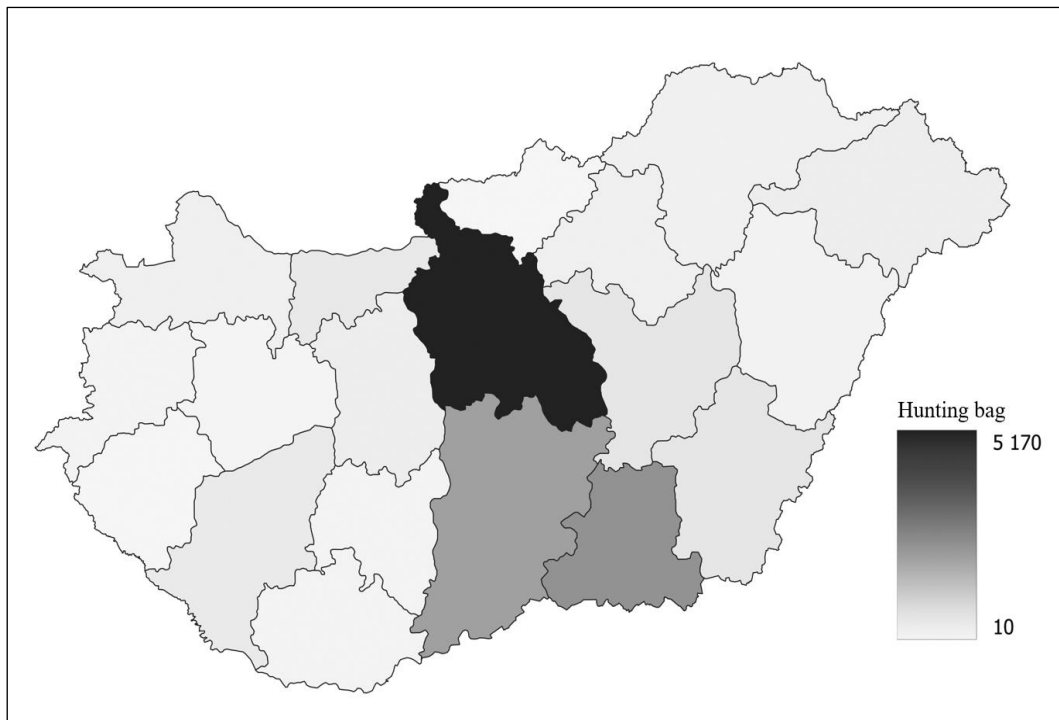
It should be mentioned that although there were already examples of out-of-season baggings in 2014, only four specimens were bagged then, and then 17 specimens the following year. In the year 2016–2017, no specimens were bagged. In 2018, the share of out-of-season hunting bags represented 0.9% of the annual baggings; in 2022 it was 39.6%. Compared to 2018, the share of out-of-season Woodpigeon baggings increased by 31.6% in 2022.

Besides the temporal dynamics of the national data, their spatial change is also important, as the central region of Hungary is the most frequented in terms of baggings, which in 1995 was shared by four counties (Pest 25%; Bács-Kiskun 17.2%, Békés and 13.2% and Jász-Nagykun-Szolnok 8%) (**Map 1**).



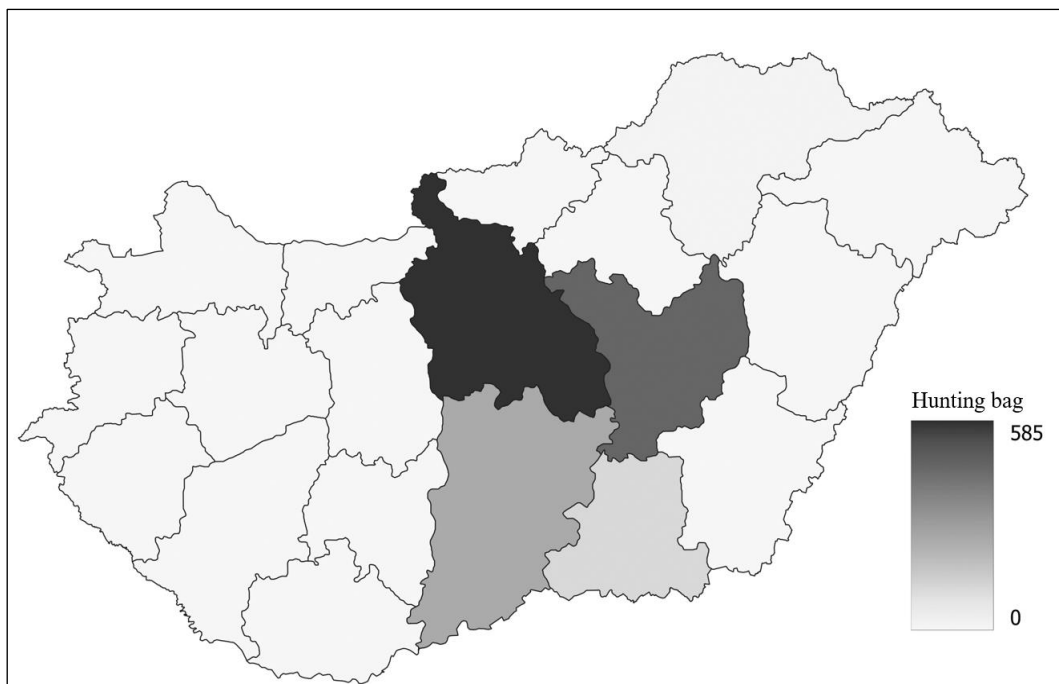
Map 1. Spatial changes of Woodpigeon hunting bags in Hungary by county, in the 1995 hunting season based on NGMD data

In 2022, a similar focus can be identified when examining the spatial evolution of hunting bags since the four above-mentioned counties are the dominant ones. Hunters still take 66.5% of the national bag in these counties. This is further confirmed by Csongrád-Csanád county, which also belongs to the same region, and comparing its hunting bag data with the former data, we can see that 83.7% of Woodpigeons bagged in 2022 in Hungary was bagged in these five counties. There is no shift in the focus as the quantities increase (**Map 2**).



Map 2. Spatial changes of Woodpigeon hunting bags in Hungary by county in the 2022 hunting season [Based on NGMD data (CSÁNYI *et al.* 2023)]

A similar picture can be seen in the data for out-of-season baggings in 2022, as these were also taken by game managers in Pest (40.9%), Jász-Nagykun-Szolnok (32.1%), Bács-Kiskun (17.6%) and Csongrád-Csanád counties (8.2%), i.e., the out-of-season baggings authorised in the spring period to prevent damage to agriculture are in line with the focus on in-season baggings, which are already concentrated in the centre of the country.



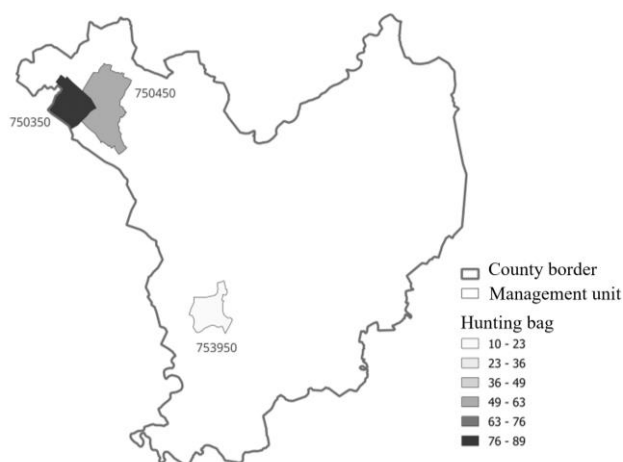
Map 3. Spatial changes of Woodpigeon out-of-season hunting bags in Hungary by county, based on NGMD in the 2022 hunting season

Jász-Nagykun-Szolnok county was selected for further detailed analysis of all the counties affected by out-of-season baggings, as this county has the highest increase in out-of-season baggings and in 2022 it accounted for the largest share (47.9%) of out-of-season baggings of the total annual number of Woodpigeon baggings in the county.

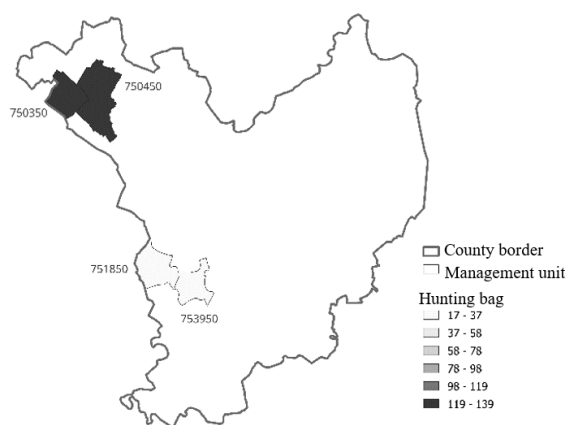
In Jász-Nagykun-Szolnok county, the first out-of-season Woodpigeon bagging was authorised in 2019, where 37 specimens were bagged by the applicant. This accounted for 11.5% of the county's hunting bag for that year. For the year 2020, three hunting associations applied for and received out-of-season hunting permits, with a total of 156 specimens bagged in their territories, which was 24% of the county's hunting bag that year (**Map 4a**). In 2021, four hunting associations received out-of-season permits for bagging Woodpigeons, with a total of 308 Woodpigeons bagged on their territories. This accounted for 31.9% of the county's hunting bag for that year (**Map 4b**). In 2022, six hunting associations applied for and received out-of-season permits for Woodpigeon bagging, with a total of 460 Woodpigeons bagged on their territory (**Map 5a**), which accounted for almost half, 47.7%, of the county's bag for that year. In 2023, nine hunting associations received out-of-season licences for bagging Woodpigeon, with a total of 1621 Woodpigeons bagged on their territory (**Map 5b**). For the year 2023, we do not yet have annual totals for the Woodpigeon hunting bag data, but compared to the previous year, the out-of-season hunting bags in Jász-Nagykun-Szolnok county alone represent 11.4% of the national hunting bag from 2022.

From the above, it can be concluded that in Jász-Nagykun-Szolnok county in 2023, more than one and a half times as many Woodpigeons were bagged during out-of-season bagging alone than in the whole year before in the county. In Jász-Nagykun-Szolnok county, the number of Woodpigeon specimens bagged out-of-season between 2019–2023 increased from 37 to 1 621, indicating the growing importance of the problem of agricultural damage and the need to increase the pressure for hunting during the critical period of damage. The managers who applied for out-of-season baggings each year are shown in **Figure 2**, with the out-of-season Woodpigeon hunting bags per year.

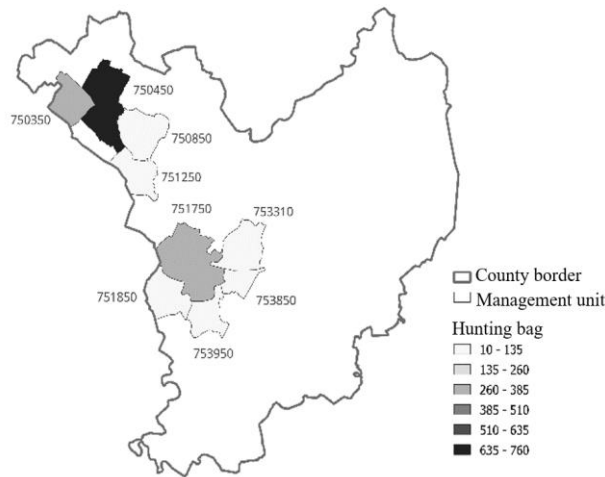
Among the managers, the hunting data of the association with the code number 309 represent a high proportion of the other hunting associations applying for an out-of-season licence. This is not due to a higher proportion of damage-sensitive agricultural crops.



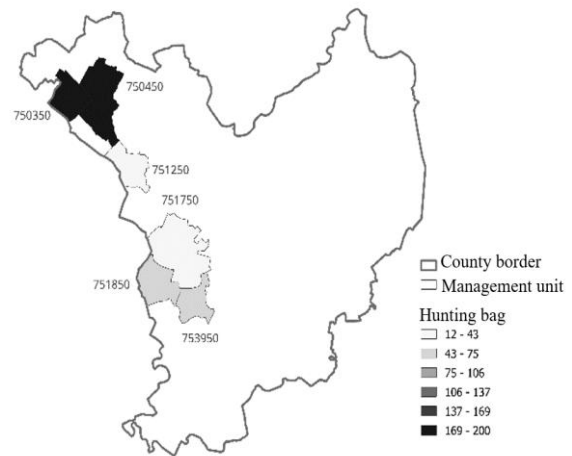
Map 4a. Spatial changes of Woodpigeon out-of-season hunting bags in Jász-Nagykun-Szolnok county in 2020



Map 4b. Spatial changes of Woodpigeon out-of-season hunting bags in Jász-Nagykun-Szolnok county in 2021



Map 5a. Spatial changes of Woodpigeon out-of-season hunting bags in Jász-Nagykun-Szolnok county in 2022



Map 5b. Spatial changes of Woodpigeon out-of-season hunting bags in Jász-Nagykun-Szolnok county in 2023

Based on our experience, the increased damage is due to the fact that the hunting areas are located on the border of Jászberény, so urbanised flocks of Woodpigeons, in addition to the Woodpigeons in the surrounding areas, contribute significantly to the increase in agricultural damage. The spatial distribution of hunting associations affected by out-of-season baggings in Jász-Nagykun-Szolnok county shows two main points of focus.

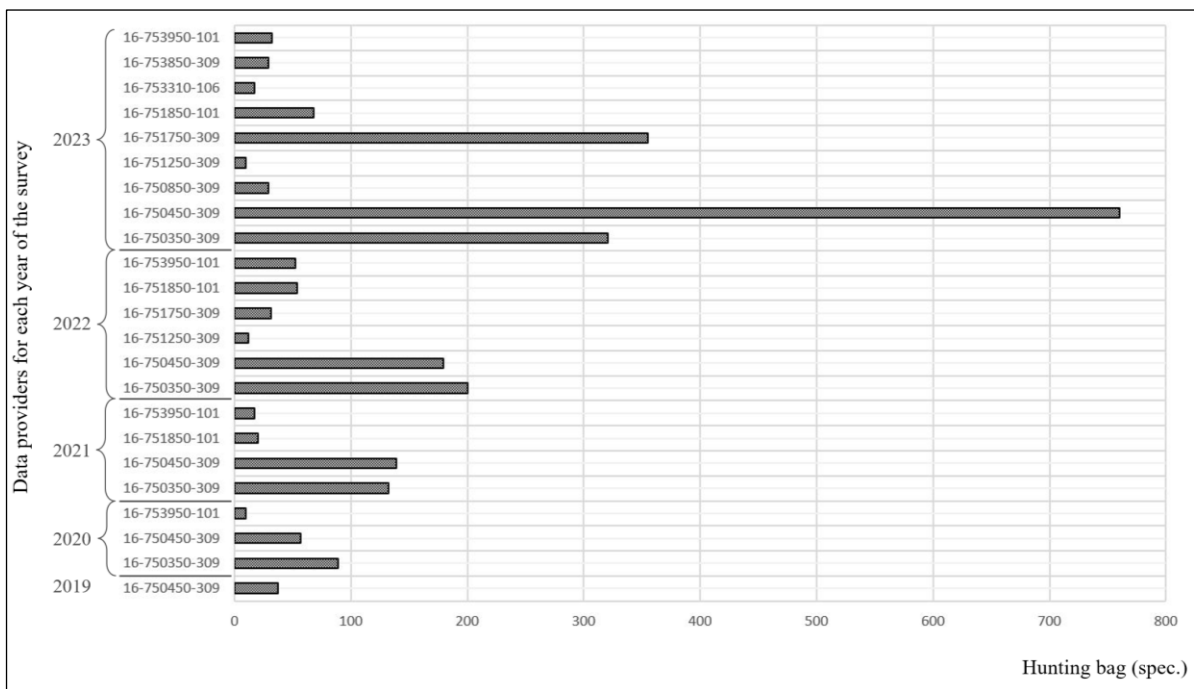


Figure 2. Changes in the out-of-season baggings of the Woodpigeon in Jász-Nagykun-Szolnok County per game manager between 2019 to 2023

The county's first focus, which is still characterised by larger hunting bag data, was in the Jászság region, namely the immediate vicinity of the settlement of Jászberény, while the other focus was in the area around Szolnok.

The possibility of out-of-season baggings due to damage is not unprecedented in other countries (e.g., Germany) (WILDTIER MANAGEMENT NIEDERSACHSEN 2023).

In these cases, however, the domestic practice differs slightly from that in Germany, as the problem is older. In Germany, there is no need for a special permit procedure, and in sensitive areas, it is automatically possible to thin out damaging birds.

In fact, there is no season for the species in England, and it can be thinned out year-round (BASC 2019). In addition to the population-reducing effect of thinning, hunting pressure is one of the most effective and practical ways of keeping flocks of pigeons away from damage-prone areas through disturbance by activity. However, there are attempts to introduce newer techniques, such as the use of drones for this purpose (e.g., Pest County, Tököl municipality).

4. CONCLUSIONS

In Hungary, there has been a significant increase in Woodpigeon hunting bags since 2016, similar to the flock estimate data for domestic breeding pairs. Although there has been an increase in baggings due to population growth, the rate - especially in damage-prone areas - is certainly below optimal, as it was only 1.6% in 2022. The increasing agricultural damage and the growing number of out-of-season bagging requests, and the number of Woodpigeons bagged each year highlight the growing economic importance of this species, given the trends of population change in Europe and the trend towards urbanisation. This is supported by our own field experience, where pigeons observed in both Jászberény and Szolnok often spend the night in the city, and from there, they move out to feed in agricultural areas and return to spend the night back in the city after feeding. The results obtained from wildlife biology research are of particular importance for the formulation and planning of the most important tasks for efficient and rational utilisation in the reduction of damage. Based on the above, a further increase in the spread of Woodpigeons in our country is predicted, and with it, an increase in the extent of agricultural damage.

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