



Essex Wildlife Trust House Sparrow Project

Summary Report

INTRODUCTION

House sparrow *passer domesticus* (hereafter 'sparrow') abundance has declined dramatically in the UK over the past 50 years, with recent trends indicating 65% loss between 1977 and 2018 (Burns *et al.*, 2020). Declines in farmland and rural populations began around the late 1970s, with a drop of approximately 60% up the mid-1990s, when numbers stabilised at this lower level (Summers-Smith, 2005). It is generally accepted that the primary reason for rural declines was a reduction in food availability resulting from intensification of farming practices. There is evidence that urban populations began to decline slowly in the 1950s, before collapsing dramatically in the 1990s (Summers-Smith, 2005). Factors attributed to the decline of urban populations include reduction of invertebrate food, essential for rearing young, and shortage of suitable nesting sites in modern urban landscapes (Summers-Smith, 2005), but little direct evidence has been produced to support these (Chamberlain *et al.*, 2007). Unlike the situation on farmland, the decline of urban populations did not appear to stabilise, and continued into the current century (Summers-Smith, 2005). Indeed, in more recent years, data show that overall abundance in the UK has plummeted further (Figure 1), and despite our recognition of the problem for some time, little has been achieved to rectify it.

Once considered the most abundant of all breeding birds in the county (Wood, 2007), the sparrow in Essex has not escaped worrying declines. In fact, within the UK, declines have been steepest in the south-east and east of England (Crick *et al.*, 2002). In February 2025, we invited people from across Essex to take part in the EWT House Sparrow Project. Each observer was asked to visit a garden or other local space on two occasions during the sparrow breeding season: once between 24th March and 30th March 2025, and again between 28th April and 4th May 2025. Participants were asked to record the maximum number of sparrows they saw within their garden or local space and any signs of sparrow breeding behaviour that they observed. Participants were also asked to record various features relating to the garden or local space. We then used this information to help us understand which features of gardens and properties influence sparrow presence and abundance in Essex. Here, we present the main findings from the survey.

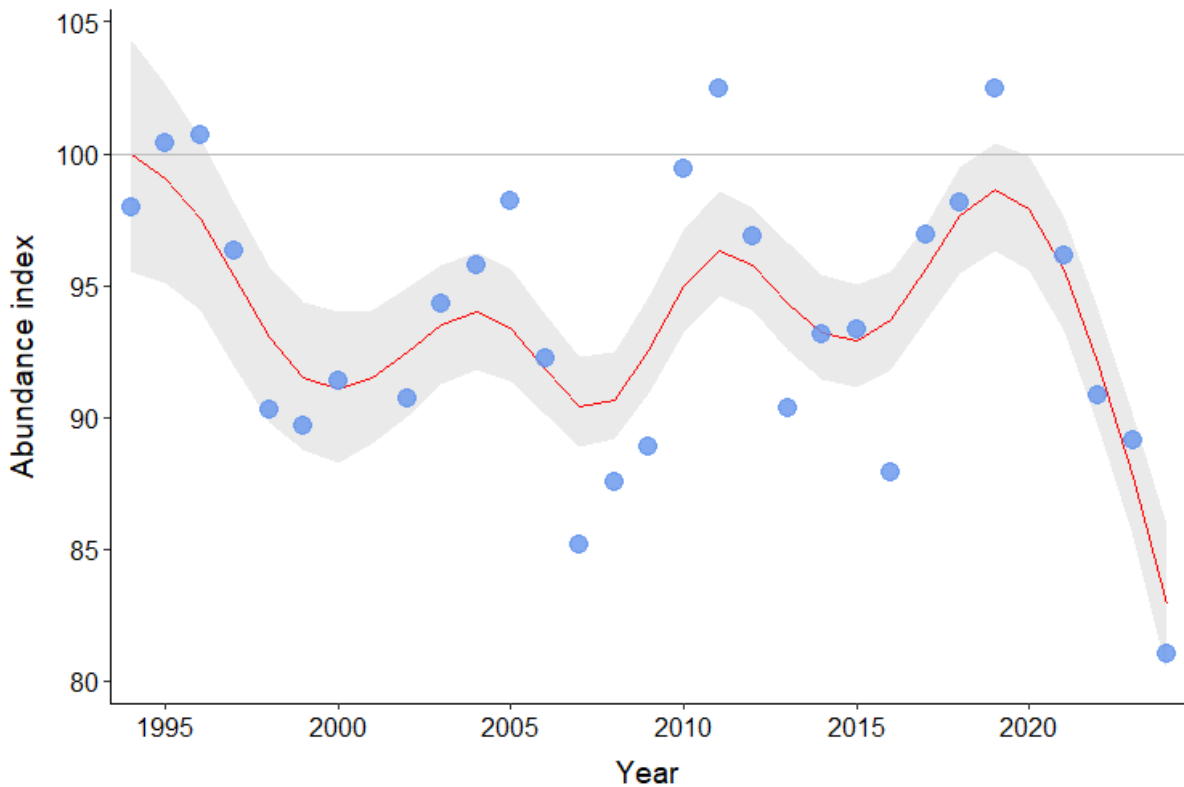


Figure 1 House sparrow population abundance in the UK from 1993 to 2024 expressed as an index set to 100 in the first year. An easy way to interpret this is to imagine that for every 100 sparrows that were present in the first year, the trend line (red line) shows how many were present in any subsequent year. The shaded area shows uncertainty around the trend line (85% confidence intervals) and blue dots show actual values for individual years. Data taken from Heywood *et al.* (2025).

SURVEY RESULTS

Participation

In total, 522 properties were surveyed and included in our analysis (501 gardens and 21 local spaces). These were widely distributed across the county, with very similar numbers within each of four regions (north-west, north-east, south-west and south-east), although there were greater densities of observations in and around larger towns and cities (Figure 2). In total, 257 properties received the specified two or more survey visits. Although 252 properties received only one survey visit, we included these in our dataset, as omitting them would have limited our analysis. We also included 13 properties that were surveyed in the 2024 trial survey and that were not re-surveyed in 2025.

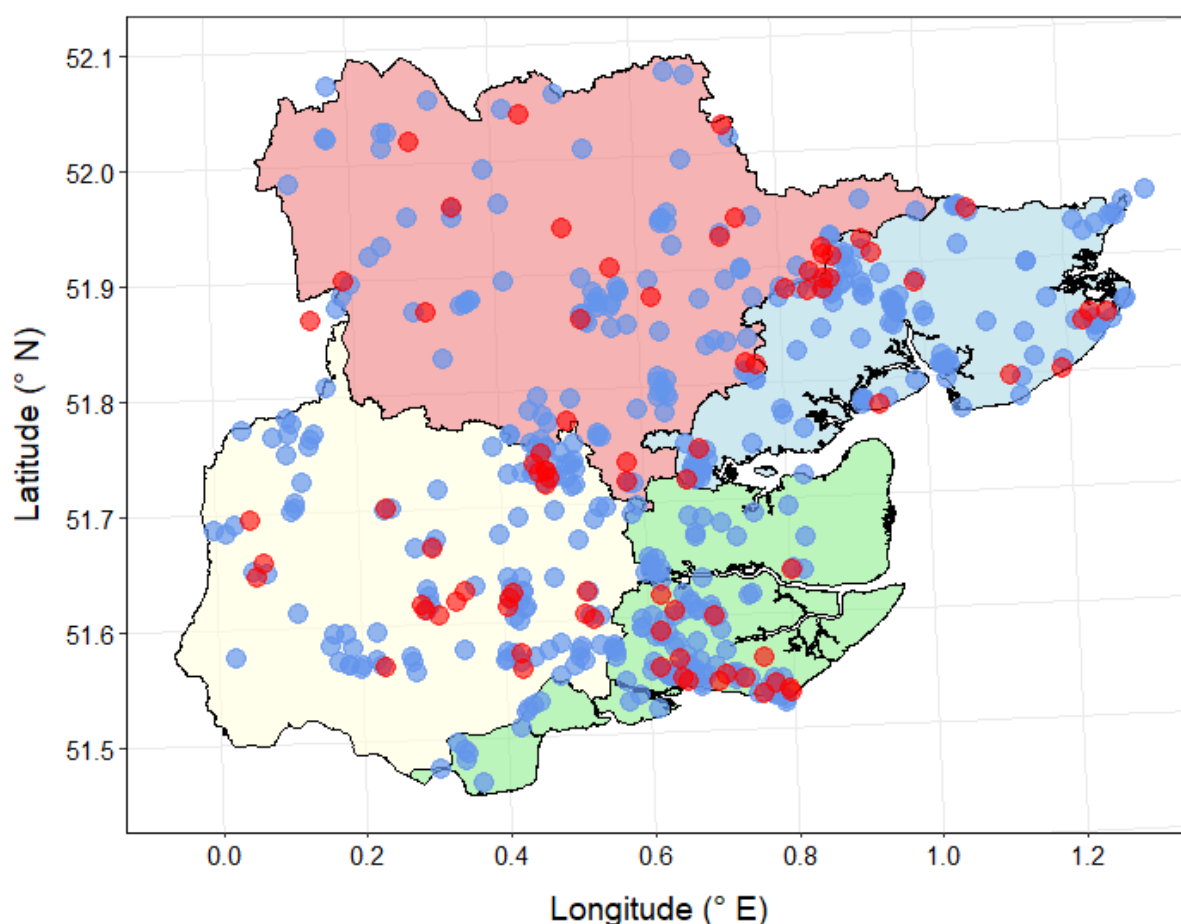


Figure 2 The locations of properties included in the EWT House Sparrow Project. Blue dots show properties where house sparrows were recorded in any one survey visit and red dots show properties where house sparrows were not recorded in any survey visits. The underlying map is coloured to show the regional division used in analysis: red=north-west; blue=north-east; yellow=south-west; green=south-east. Properties located just outside of the Essex border were assigned to the closest region.

House sparrow presence and abundance

For properties that were visited twice, we recorded sparrows as ‘present’ if they were recorded within any one visit, and the highest count from the two visits was used in analysis of sparrow abundance. For properties that were visited more than twice, we considered only the first visit and the follow-up visit that fell within, or closest to, the specified period for the second visit. For properties that were visited once, we could consider only the data collected during this one visit. We then used statistical models to analyse the effect of the various property and garden features on sparrow presence and sparrow abundance.

House sparrow presence

Sparrows were present at 84% of participants' gardens or local spaces. Our statistical analysis found that of all the garden and property features considered in our survey, only **property age** significantly influenced whether sparrows were present or absent from gardens during surveys, with properties built post-2019 being less likely to record sparrows than all other property age categories (Figure 3). Our analysis indicated that properties situated within 100 m of **fields containing livestock or horses** may also be more likely to record sparrow presence, as, although this feature was not statistically significant in our model, it was nearly so ($p=0.059$)¹.

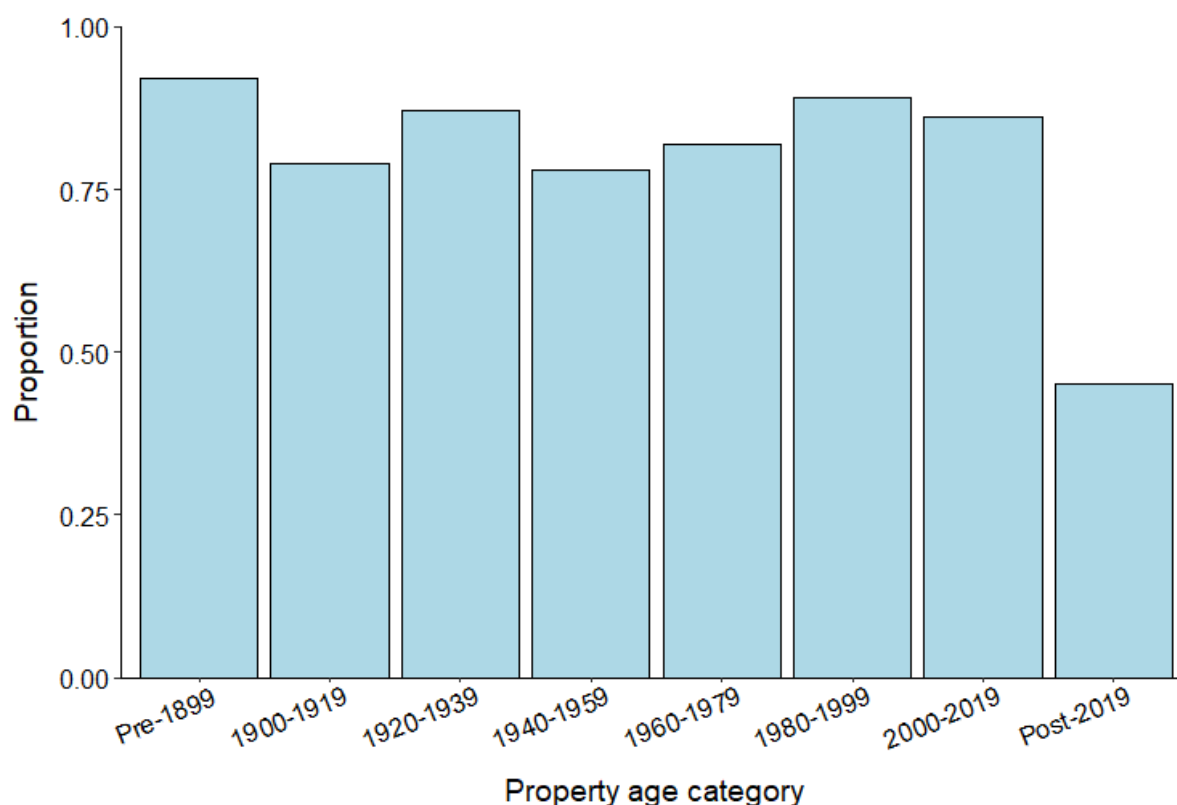


Figure 3 The proportion of properties within each age category that recorded house sparrow presence.

¹ Statistical significance of a variable within a model is indicated by the p-value. If $p \leq 0.05$ the variable is statistically significant and we have greater confidence that its influence did not occur by random chance.

House sparrow abundance

Our statistical analysis showed that the following factors influenced sparrow abundance across all the properties in our survey.

- **Property age.** The relationships between the various property age categories was complex, but, in general, houses within 1900-1919 and 1940-1959 age categories had most sparrows, and properties in the 1920-1939 and 2000-2019 age categories had least sparrows.
- **Region.** Properties in the south-east region of Essex had more sparrows than all the other regions (see Figure 1 for regional division).
- **Built-up vs non built-up areas.** Properties within non-built-up (rural) areas had more sparrows than properties in built-up (urban, suburban) areas.
- **Green recreational spaces.** Properties within 100 m of green recreational spaces had more sparrows than properties that were not within 100 m of such spaces.
- **Ponds:** gardens with a greater proportion of area devoted to ponds had more sparrows.
- **Artificial surfaces:** gardens with a greater proportion of area devoted to artificial surfaces (paved, decking, artificial grass) had less sparrows.
- **Vegetable patches:** gardens with a greater proportion of area devoted to vegetable patches had less sparrows.
- **Bird feeders:** properties that provided bird feeders had more sparrows than properties that did not provide bird feeders.

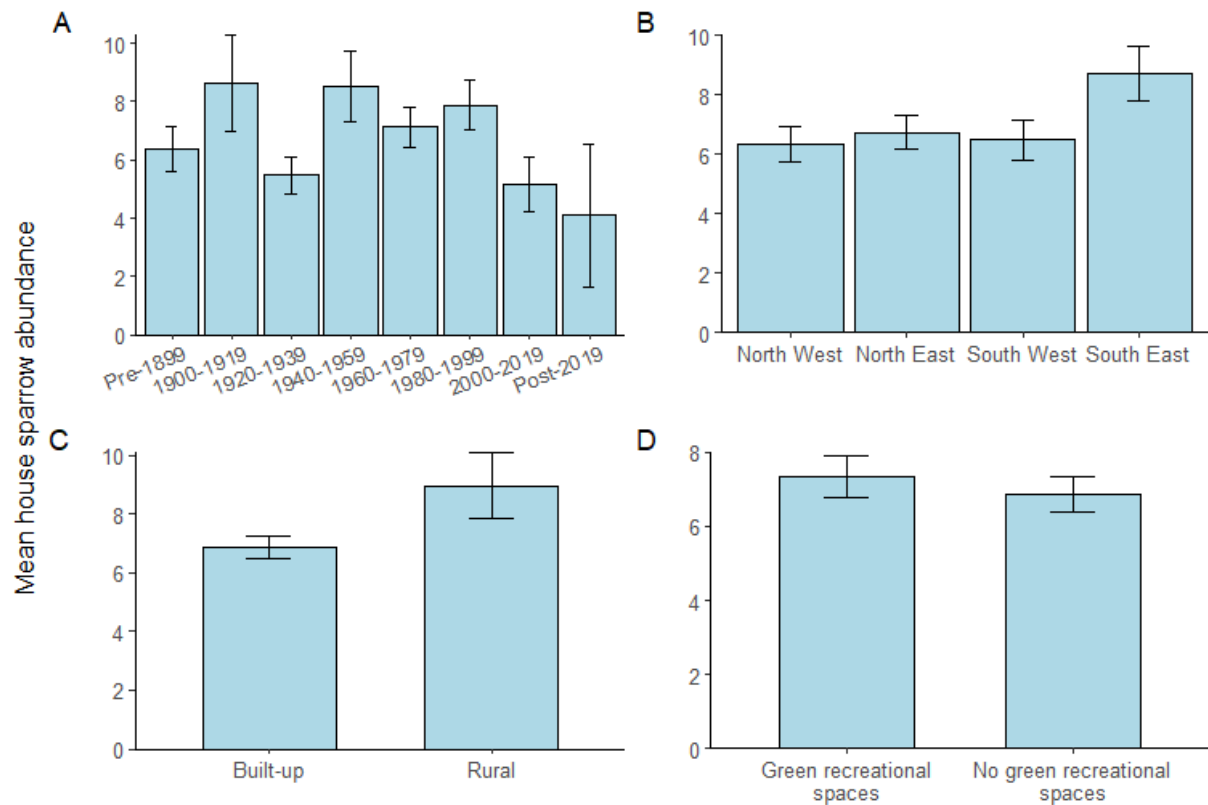


Figure 4 Mean house sparrow abundance A) by property age category, B) by region of Essex, C) by built-up (urban, suburban) vs non built-up (rural) areas, and D) at properties within 100 m of green recreational spaces vs properties that were not. Error bars= ± 1 standard error, which is a measure of the variation in the data. All of these factors were found to have a statistically significant effect on mean house sparrow abundance.

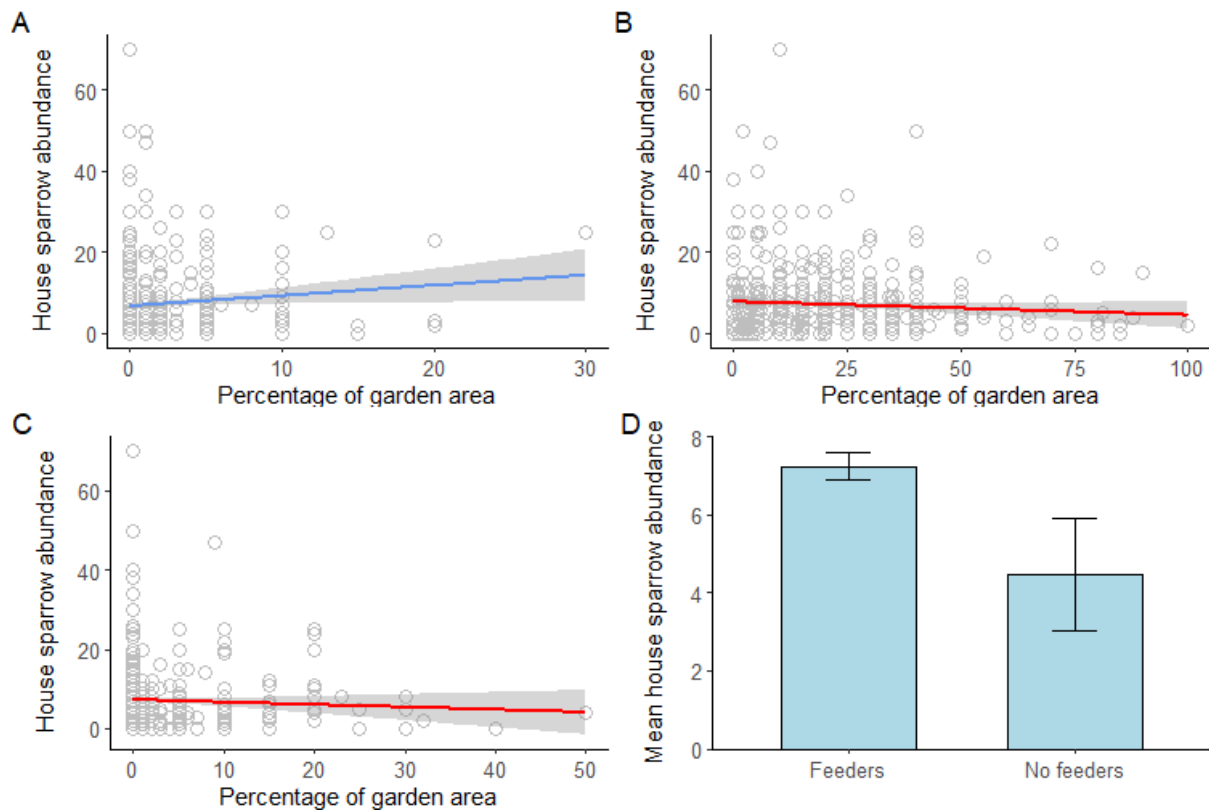


Figure 5 The effect of increasing percentage cover of A) pond, B) artificial surfaces (paved, decking, artificial grass) and C) vegetable patch within gardens on house sparrow abundance. Positive effects are shown by a blue trend line and negative effects by a red trend line. The shaded area shows uncertainty around the trend lines (95% confidence intervals); and D) the mean abundance of house sparrows at properties with and without bird feeders. Error bars = ± 1 standard error, which is a measure of variability in the data. All of these factors were found to have a statistically significant effect on mean house sparrow abundance.

House sparrow breeding behaviour

The following factors were found to significantly influence the likelihood of observing sparrow breeding behaviour (aggression, display, mating, carrying nest material, carrying food, entering nest, feeding fledglings).

- **Number of nestboxes:** breeding behaviour was more likely to be observed at properties that provided more nestboxes.
- **Green recreational spaces:** breeding behaviour was more likely to be observed at properties within 100 m of green recreational spaces.

The following factors were not found to be statistically significant in our analysis, but were nearly so.

- **Property age:** breeding behaviour was less likely to be observed at properties built between 2000-2019 ($p=0.08$).
- **Bird feeders:** breeding behaviour was more likely to be observed at properties that provided bird feeders ($p=0.056$).
- **Arable crops:** breeding behaviour was more likely to be observed at properties within 100 m of arable crop fields ($p=0.053$).

The effect of nestbox clustering and entrance hole size on breeding behaviour

Using a subset of data containing only the properties that provided nestboxes, we performed a further analysis that suggested there was greater likelihood of observing sparrow breeding behaviour when the nestboxes with entrance hole sizes between 31-35 mm were arranged in clusters ($p=0.056$).

DISCUSSION

The EWT House Sparrow Project has shown that sparrows remain widespread throughout Essex (Figure 2). Furthermore, sparrows were present within the majority (84%) of all gardens and local spaces surveyed. Although, it is possible that people were more likely to participate in the project if they knew that sparrows regularly visited their garden, or, people may have been less likely to submit negative records. It is perhaps because sparrows were present at most properties, regardless of the features of those properties or their gardens, that our analysis found few features that influenced presence, and only sparrow abundance varied according to property or garden features.

Property age was the only significant factor influencing both sparrow presence and abundance. In general, older properties were more likely to record sparrows than newer properties (Figure 3), and in greater abundance (Figure 4A). This is likely because older properties provide more nesting opportunities than new-build properties (Wotton *et al.*, 2002). Additionally, older properties may have larger garden spaces with more mature vegetation.

Our data also showed that sparrows were more abundant in gardens in the south-east region of the county (Figure 4B). This might be because housing density in this relatively heavily-populated region is beneficial for sparrows. Indeed, a previous study found greater sparrow abundance in areas of high housing density (Heij, 1985). Sparrows nest in loose colonies, which may not move far throughout their lifetime. This could lead to patchy distributions within towns and cities as some colonies become extinct, but in areas of high housing density, colonies may persist in close proximity, allowing repopulation of vacated spaces and bolstering of dwindling colonies. However, this is speculative at present and warrants further investigation.

Sparrow abundance was greater in non built-up (or rural) areas. In Britain, rural sparrow populations have declined less than urban populations (Robinson *et al.*, 2005), and previous studies have found that highest densities occur in rural housing and farm buildings (Chamberlain *et al.*, 2007). Our data indicate that this may also apply in Essex.

Of the various surrounding habitat types or features that participants were asked to record (e.g., woodland, arable, livestock, allotments), only green recreational spaces had a significant positive influence on sparrow abundance. This may be particularly relevant in built-up areas, where greenspaces are limited, but in areas where, e.g., arable fields and livestock are present, sparrows may be drawn to human habitation. Woodland is rarely used by sparrows, and this can explain why close proximity of this habitat had no influence on sparrow abundance in gardens.

The remaining property or garden features found to significantly influence sparrow abundance were all features that participants can control, and hence, point towards actions that people can take to make their homes or gardens more suitable for sparrows. The benefits of ponds to wildlife, including birds, are well understood (Williams *et al.*, 2018). Artificial surfaces provide little or no foraging potential for birds, and Vincent (2005) found sparrows have more success in feeding and fledging young in areas containing a high proportion of shrubs and relatively little concrete. In addition, flat artificial surfaces provide little safety and cover for foraging sparrows. The negative effect of increasing vegetable patch cover on sparrow abundance was perhaps unexpected, and requires further investigation. It might reflect a repellent effect of some pesticides on sparrows (Gabr, 2004), but our survey did not collect information on the use of pesticides

in gardens, so we cannot draw conclusions on this. Otherwise, this may be the result of an anomaly in our dataset.

In terms of abundance, sparrows are often a dominant species at bird feeders (Cowie and Hinsley, 1988; Galbraith et al., 2017). So, it is unsurprising that properties providing bird feeders recorded greater sparrow abundance. However, our data were unable to detect any preference in food-type shown by sparrows. Food preference could be the subject of further investigation using a more targeted survey approach.

Finally, the EWT House Sparrow Project revealed that provision of bespoke nestboxes, with entrance holes of 31-35 mm diameter, and that are arranged in clusters or loosely spaced groups can have positive effect on the likelihood of observing sparrow breeding behaviour. As a colonial nesting species, these nestbox specifications fit those recommended by the RSPB and British Trust for Ornithology (du Feu, 1993), and may be particularly useful where there is a lack of nest sites in modern or renovated properties.

ACKNOWLEDGEMENTS

We would like to thank all the volunteers who took part in the EWT House Sparrow Project, with whose time and effort we can better understand the distribution of house sparrows in Essex and the factors affecting their continued decline.

Front cover image: House sparrow by Mark Hamblin/VISION2020

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