

SECOS Winter Garden Bird Survey

Data Analysis Explanatory Notes

Background

The Winter Garden Bird Survey is open to SECOS members and non-members. The survey period covers the 36 years from the 1985-86 season to the 2020-21 season. Each season covers 26 weeks from October to March. Each observer completes two survey forms for each season, one covers weeks 1-13 and the other covers weeks 14-26. The form lists 22 species that are commonly seen in gardens – these are referred to as 'listed species'. There is room on the form to record non-listed species. For each week, the observer records a maximum count of each species.

Data

The survey data is stored in an Access database. There are currently more than 525,000 records in the database.

The number of participating observers varies from season to season but is generally in the region of 50.

The number of weeks surveyed by an observer also varies. Most observers in most seasons have recorded species counts for the entire season of 26 weeks. However, in some seasons a few observers have not covered all weeks.

Method

This analysis covers 'listed species'. The bird counts for non-listed species are too small and patchy to enable data trends to be determined.

The number of observers, and the number of weeks surveyed by each observer, varies from season to season. Other factors being equal, these changes will affect the total bird counts. To produce trends of species counts, the impact of variable numbers of observers and surveyed weeks has been removed.

For each season, the total bird count for each species, and the total number of surveyed weeks, have been calculated, and then used to calculate a mean bird count per observer per week.

The following example demonstrates how this has been done for a single species. Suppose that there are 3 observers (normally around 50 observers) and that they survey 6, 6 and 4 weeks (normally up to 26 weeks). The following table shows species counts for each observer in each week.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Observer 1	2	3	2	4	2	2
Observer 2	3	5	5	2	2	1
Observer 3	2	1	1	2		

The total bird count is $2 + 3 + 2 + 4 + 2 + 2 + 3 + 5 + 5 + 2 + 2 + 1 + 2 + 1 + 1 + 2 = 39$.

SECOS Winter Garden Bird Survey

Data Analysis Explanatory Notes

The total number of surveyed weeks = 6 + 6 + 4 = 16.

Therefore, the mean bird count per observer per week = 39/16 = 2.4 (to 1 decimal place).

So, for the 6-week survey period, the mean bird count per observer per week is 2.4.

This means that, on average, each observer has seen 2.4 birds each week.

Results

For each species, a bar chart provides a graphical representation of the values throughout the survey period. In each chart, there is a red 'linear trendline' and a green '5-season moving average' line. For most species, there is data for the entire survey period. However, some species do not have data for the early seasons of the survey period.

The 'linear trendline' is a best-fit straight line through the data (using least squares regression) – it shows the overall trend through the survey period.

The '5-season moving average' line shows short-term changes in the data that are masked by the linear trendline.

For some species, the rate of change varies substantially throughout the survey period. For example:

House Sparrow

Start Season	End Season	Period (Years)	Comment
1985-86	2001-02	16	Slight fall
2001-02	2003-04	2	Numbers nearly halved
2003-04	2012-13	9	Level
2012-13	2014-15	2	Sharp fall
2014-15	2019-20	5	Level

Starling

Start Season	End Season	Period (Years)	Comment
1985-86	2002-03	17	Level
2002-03	2006-07	4	75% decrease
2006-07	2019-20	13	Slight fall

Limitations

The sample size is tiny when compared with the total number of gardens in the SECOS Recording Area.

SECOS Winter Garden Bird Survey

Data Analysis Explanatory Notes

We cannot be sure that observers have adhered strictly to the survey guidelines. For example, some flyovers and birds on land adjacent to the surveyed garden may be included.

The counts are based on casual observation. Observations are likely made for only a part of the day.

The quantity and variety of bird food provided in gardens have likely increased since the 1985-86 season.

Conclusion

Species trends vary widely, from those that have increased several-fold (e.g. Goldfinch, Jackdaw and Wood Pigeon) to those that have declined by more than two-thirds of their 1985-86 numbers (e.g. House Sparrow, Song Thrush and Starling). In many cases, trends are substantially non-linear.