

## 2018 SCIENTIFIC REPORT

XperiBIRD.be

NATURAL ENVIRONMENTS OPERATIONAL DIVISION  
BELGIAN ROYAL INSTITUTE OF NATURAL SCIENCES





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December 2018

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## FOREWORD

The XperiBIRD.be nesting boxes with cameras installed in the schools and associations in the four corners of Belgium are a magnificent means of observing nature and collating scientific information! However, scientific does not necessarily mean complicated! First and foremost, it involves thoroughness in collecting and recording data as well as in its analysis.

The scientific objective of the XperiBIRD.be programme is clear: to monitor, discretely but accurately, from Arlon to Oostende, the demographical parameters of different species of cavernicolous passerines.

Why cavernicolous passerines? The answer is simple. Installing a camera-operated observation system in the immediate vicinity of a nest made of grass and twigs in the midst of a hedge by a blackbird or a hedge-sparrow would be impossible. It would create such disruption that the bird would soon abandon the site! On the contrary, cavernicolous birds build their nests using moss and horsehair in an existing dwelling, such as a hole carved out in a tree by a woodpecker... or a nesting box installed by a school participating in the programme XperiBIRD.be programme! If the camera is installed in the nesting box before the first visits of the birds, they consider it to be part of the furniture and are therefore not troubled by its presence. Tits and sparrows are archetypal cavernicolous birds so this is why we have chosen to observe them!

What exactly does “demographic parameters” mean? Again the answer is simple. Demography is the study of the characteristics of populations and how they evolve. This study is carried out via patient observation of various parameters such as the number of individuals (inventory), birth rate, survival rate and death rate. This helps to discover the changes that would remain unnoticed without this type of study, to quantify them and, additionally, to compare such changes with other parameters like weather conditions, type of habitat, food availability, competition with other species, etc. In the end, it helps to monitor the evolution of bird populations in order to better protect them, but also to raise the alarm more widely and noticeably in case of worrying developments. Birds are interesting bio-indicators that can provide useful information on the overall state of our environment and therefore the planet Earth as a whole.

Tits and sparrows are clearly not among the rarest species. Why, then, has the choice been made to observe and study their demographics? Because these birds are broadly present in Belgium and it is therefore perfectly possible to establish a large observation and data collection network. The more data there is and the more widely they are found within the study’s territory, the better the comparisons and analysis will be. Moreover, quality analysis of demographic developments requires comparison of observations made over a period of several years. A great tit can reach the age of 15 years old; indeed, the record for ‘old age’ in house sparrows is 19 years – making conclusions after 2 to 3 years would not therefore be particularly meaningful.

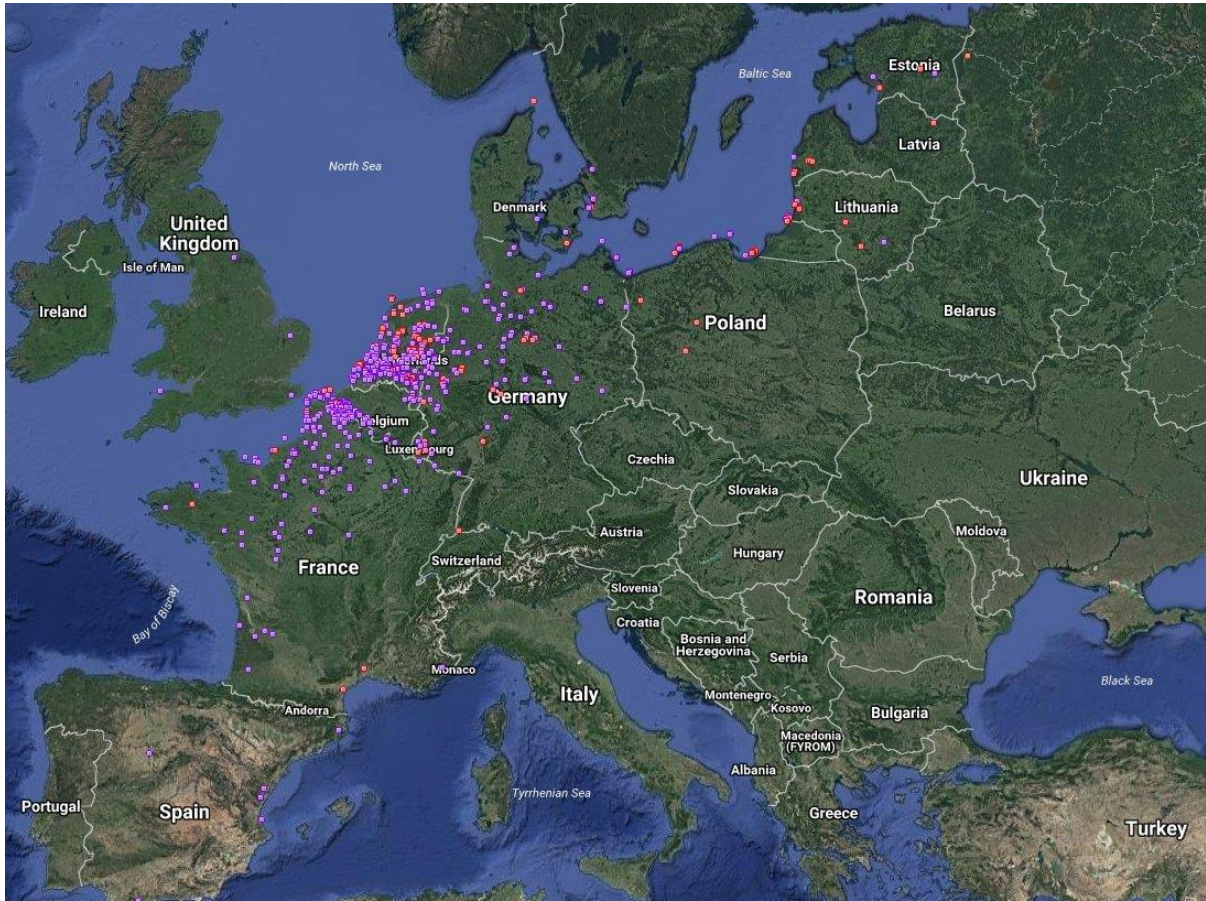
We are therefore counting on each school, each association participating in the XperiBIRD.be programme to make and record thorough observations over a good number of years!

Let’s get down to business. Here are the parameters that we will observe and study together:

- The number of nesting couples (a couple is deemed to be nesting once at least one egg has been laid).
- The number of eggs per clutch (from the moment when brooding starts; if the birds do not brood, it is very likely that the clutch has been abandoned, following the death of the mother bird, for example, which would distort the data).
- The number of eggs hatched per brood.
- The number of chicks that takes flight per brood.



Additionally, banding of chicks makes it possible to study two further parameters: the movements (migration) of birds after they have taken flight as well as the death rate and its causes. It is not possible to band each XperiBIRD.be brood because this operation must be carried out by a bander certified by the Belgian Royal Institute of Natural Science. If you would like “your” brood of tits or sparrows to be banded, contact us and we will put you in contact with one of our specialists. The data will supplement work undertaken in this sphere since 1927 in Belgium.



Map of movements of blue tits banded or recaptured in Belgium (1927-2018). The mauve points indicate the places where blue tits banded in Belgium have been observed. The red points denote the sites where blue tits banded abroad have been spotted in Belgium (the data concerning all the birds banded in Belgium can be consulted on line at <https://odnature.naturalsciences.be/bebirds/fr/ring-recoveries>).





## RESULTS FROM 2017 & 2018

The results recorded in 2017, the first year of operations for the XperiBIRD programme, were not presented in a separate report because the amount of data was too limited. They have therefore been included in this report in order to allow initial comparisons.

The results are presented by species and make it possible to draw up a “dashboard” of demographic parameters with regard to nesting of the 6 species observed to date in the nesting boxes fitted with cameras.

### Great tit

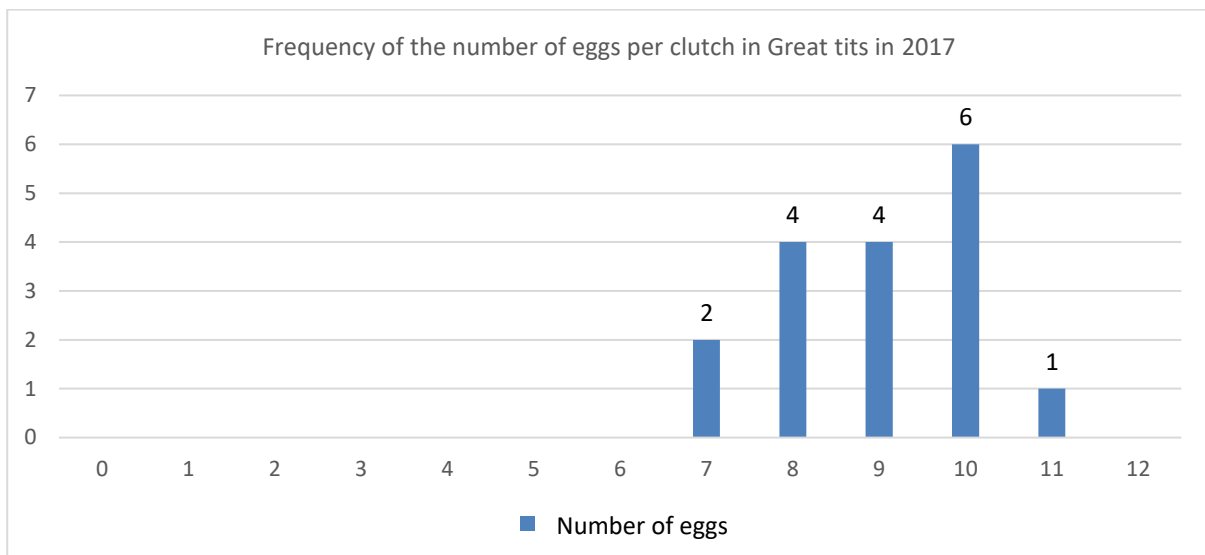
#### Number of nesting couples

2017: 18 nesting couples recorded

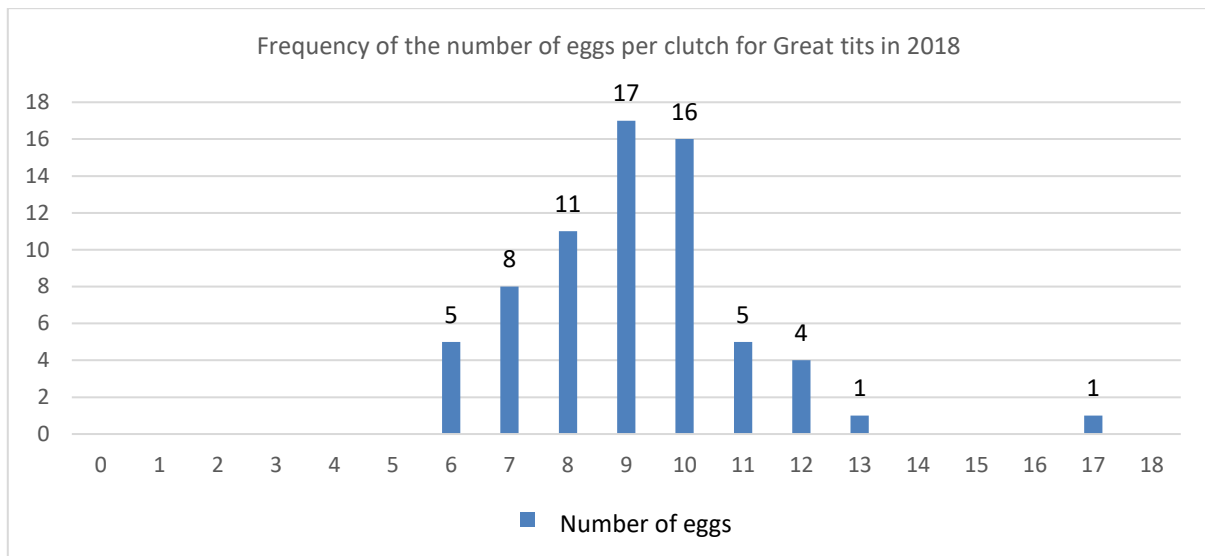
2018: 70 nesting couples recorded

#### Number of eggs laid per clutch

2017: 153 eggs laid in total, with an average of 8.5 eggs per clutch

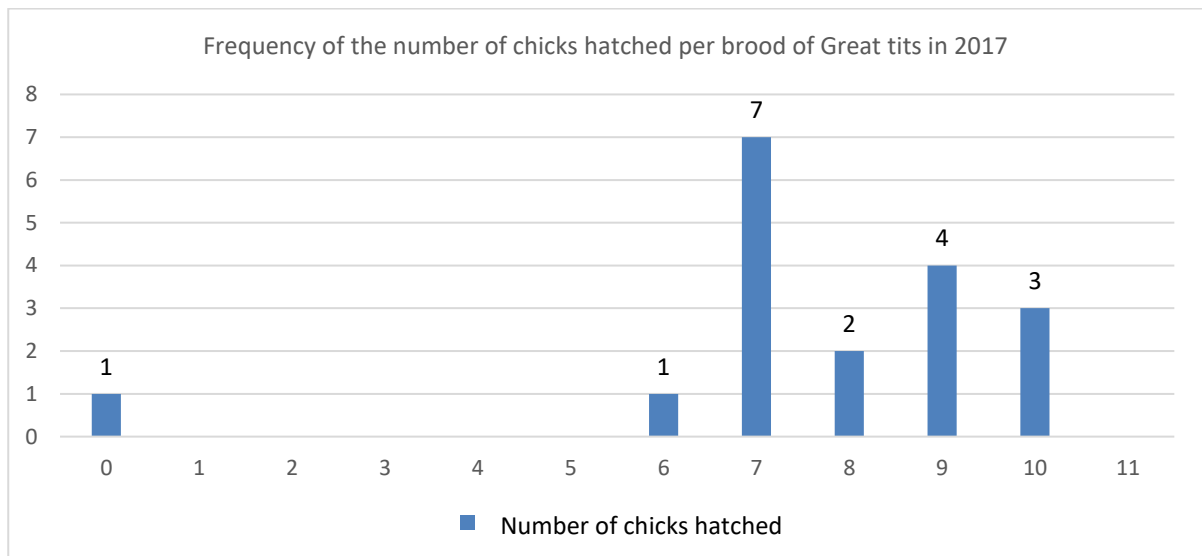


2018: 620 eggs laid in total, with an average of 8.8 eggs per brood

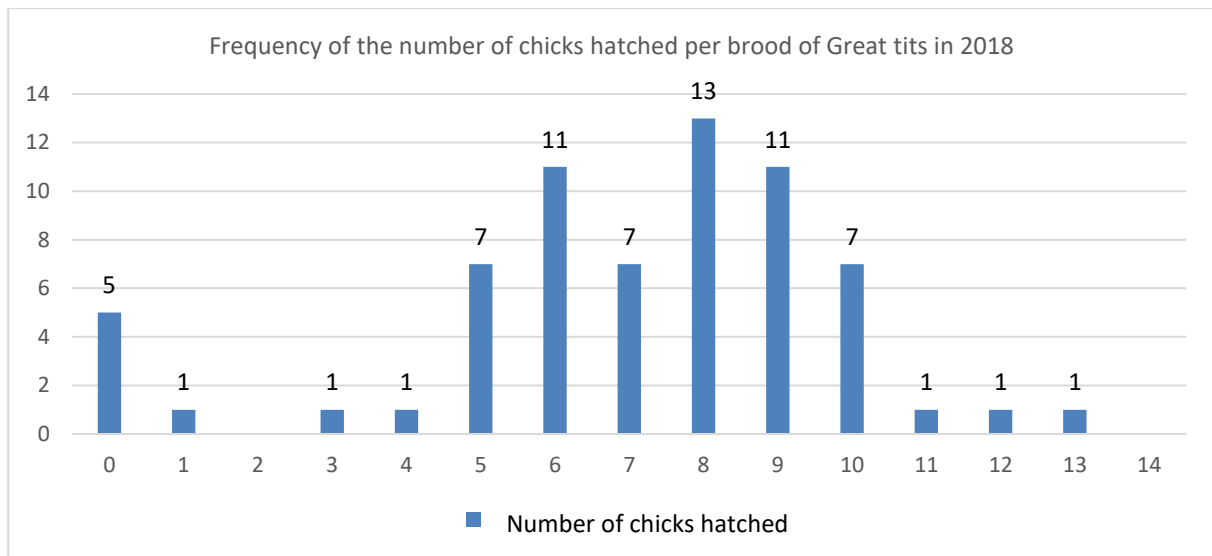


Number of chicks hatched per brood

2017: 137 chicks hatched for 17 clutches hatched, with an average of 8.0 chicks per brood.

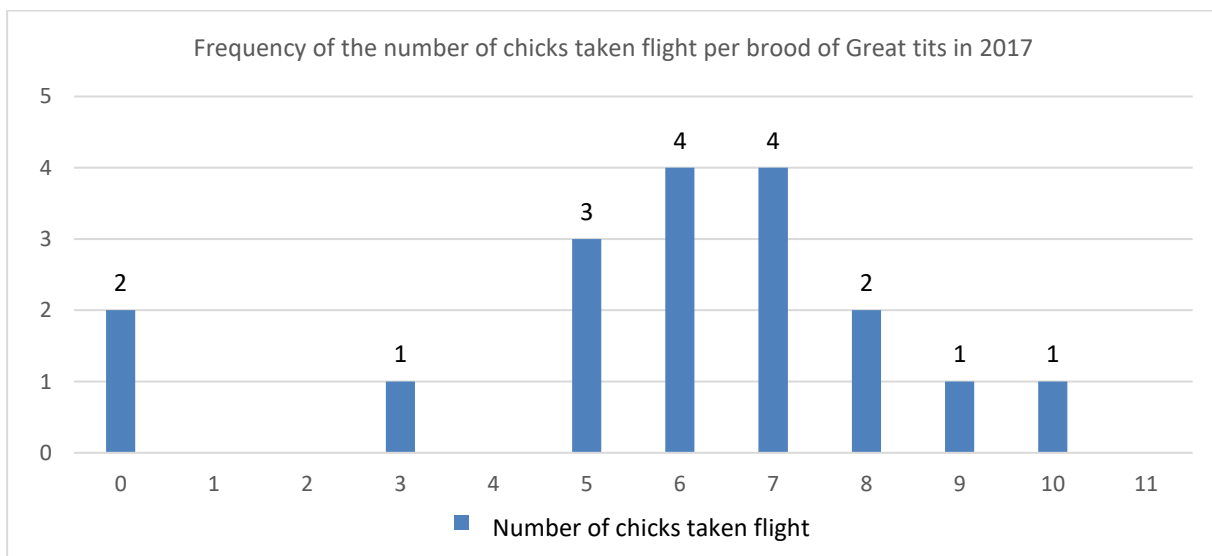


2018: 467 chicks hatched for 70 clutches hatched, with an average of 6.7 chicks per brood.

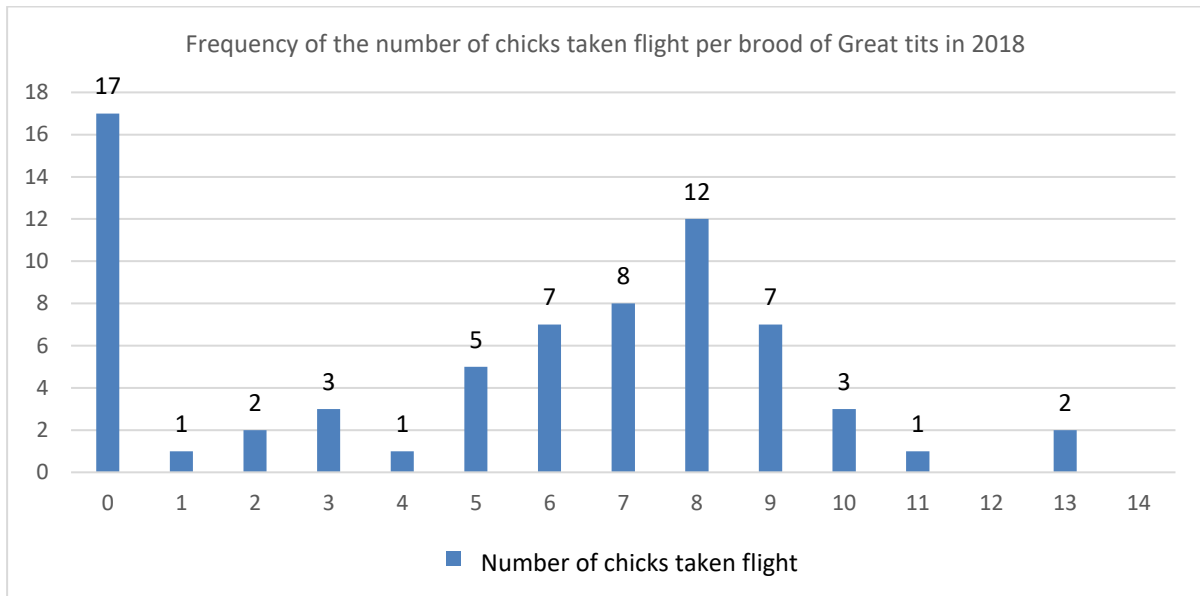


Number of chicks taken flight per brood

2017: 105 chicks taken flight for 16 successful broods, with an average of 6.5 chicks per brood.



2018: 367 chicks taken flight for 53 successful broods, with an average of 6.9 chicks per brood.



### **Blue tit**

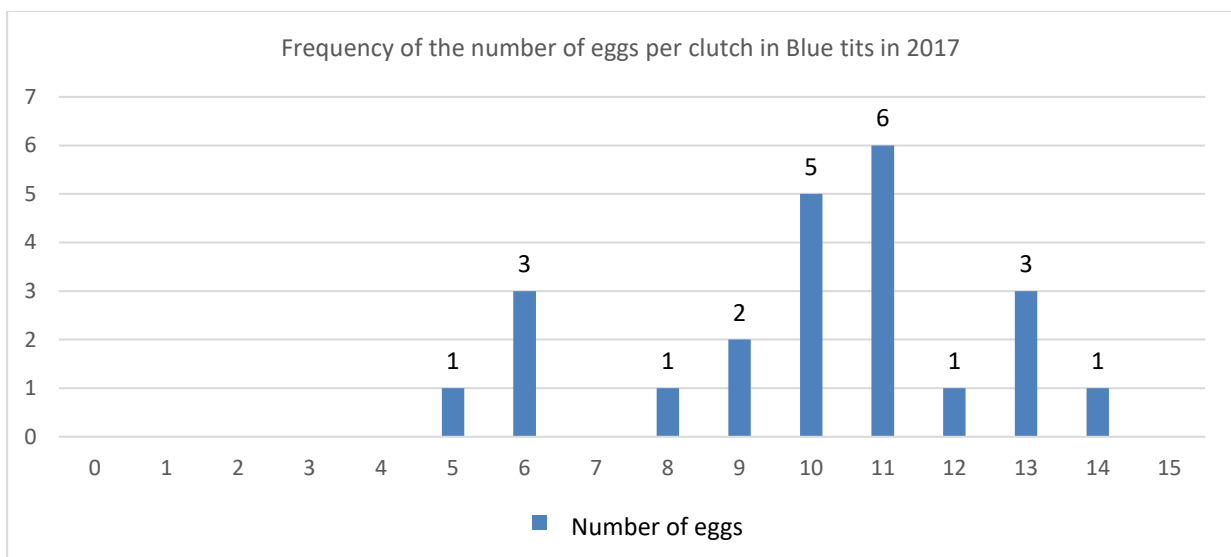
#### Number of nesting couples

2017: 23 nesting couples recorded

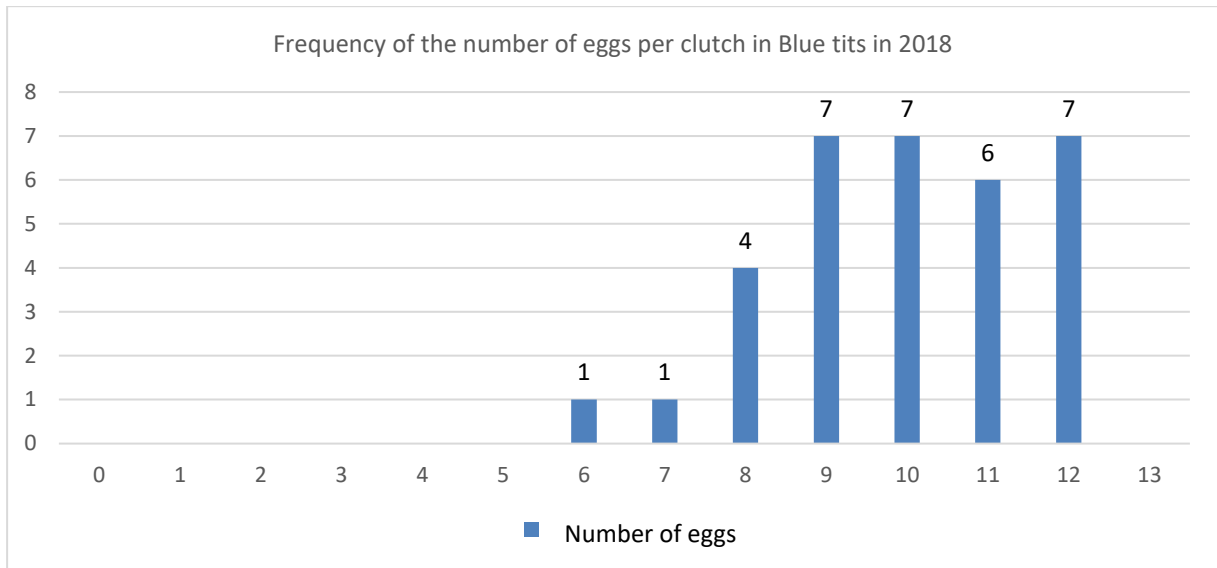
2018: 34 nesting couples recorded

#### Number of eggs laid per clutch

2017: 230 eggs laid in total, with an average of 10 eggs per clutch

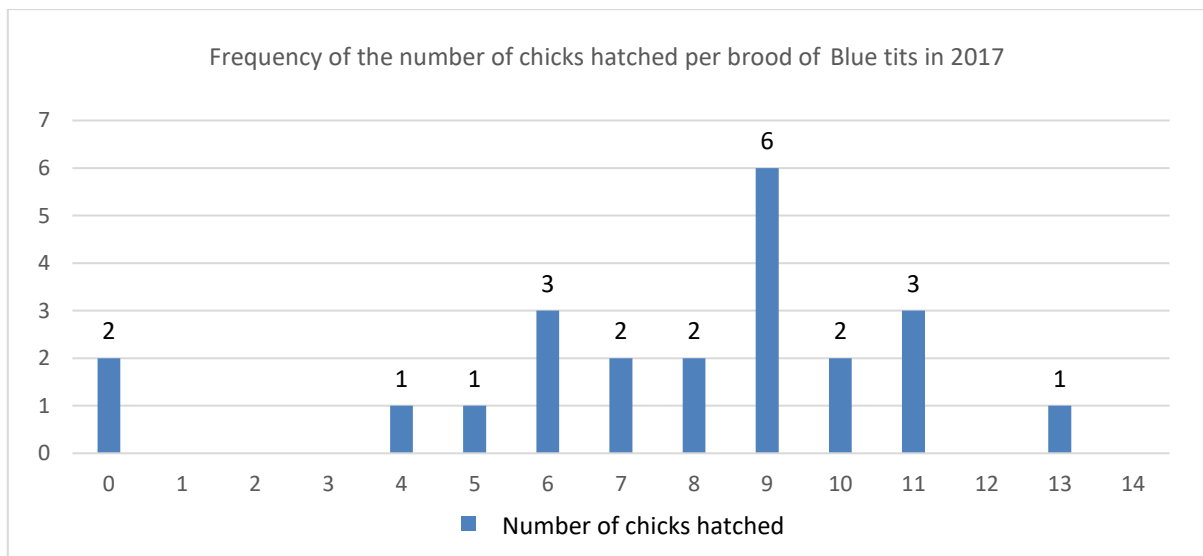


2018: 328 eggs laid in total, with an average of 9.6 eggs per clutch

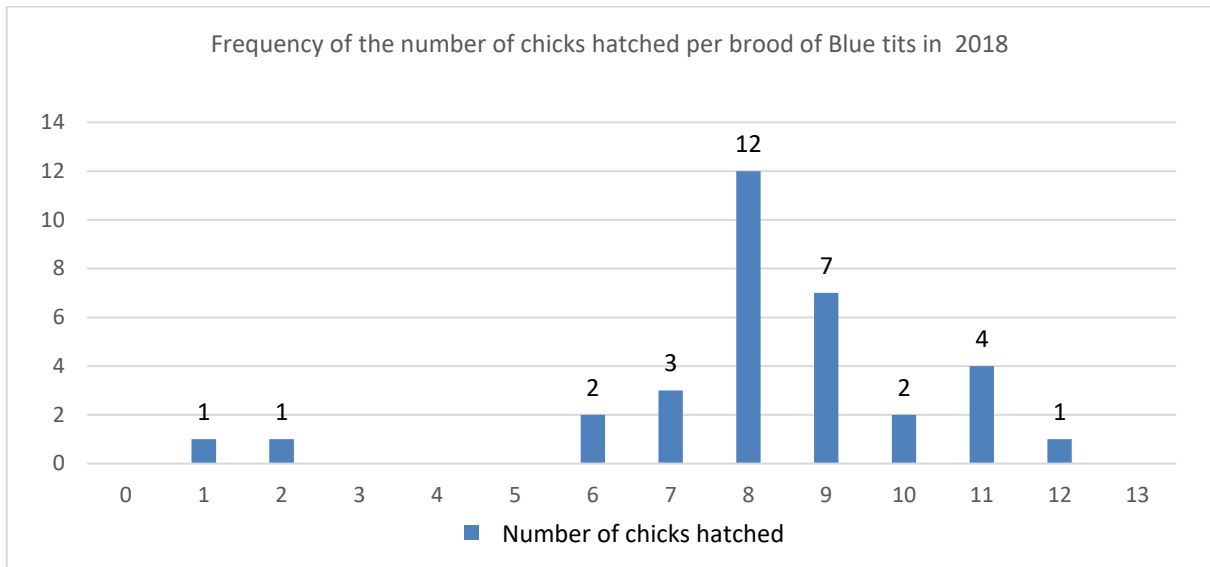


Number of chicks hatched per brood

2017: 177 chicks hatched for 21 clutches hatched, with an average of 8.4 chicks per brood.

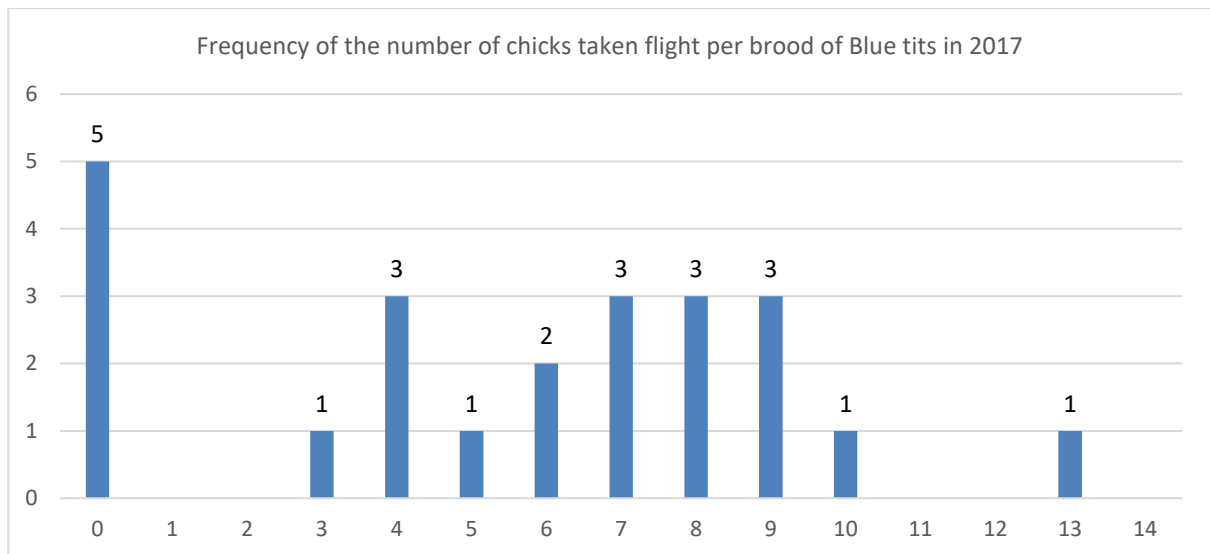


2018: 271 chicks hatched for 34 clutches hatched, with an average of 7.9 chicks per brood.

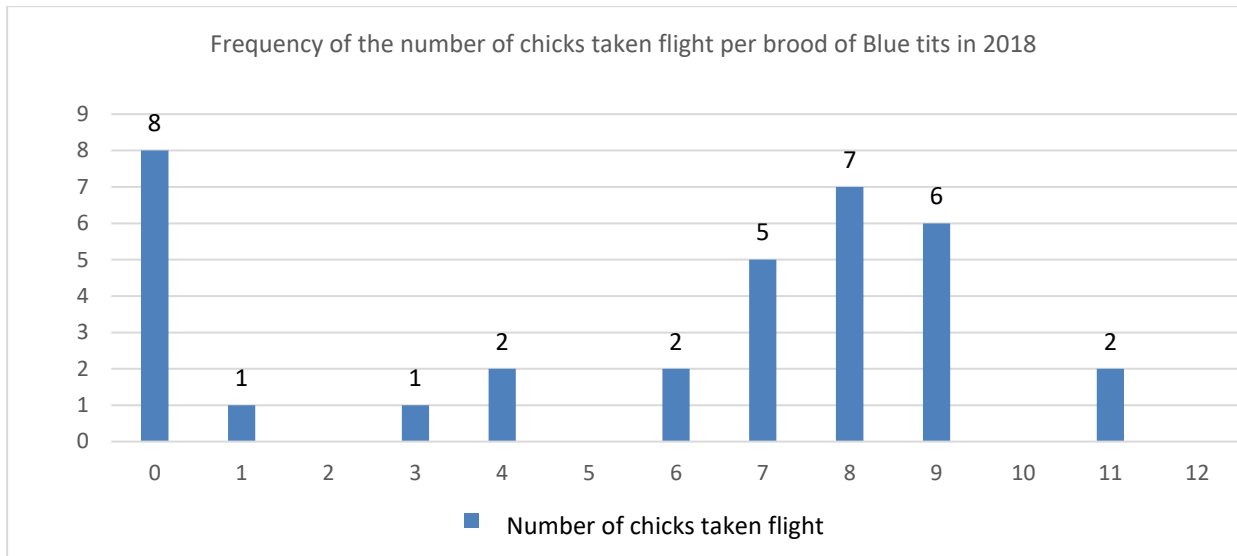


Number of chicks taken flight per brood

2017: 127 chicks taken flight for 18 successful broods, with an average of 7.0 chicks per brood.



2018: 191 chicks taken flight for 26 successful broods, with an average of 7.3 chicks per brood.



#### **Willow tit**

A brood was observed during spring 2018. There were 9 eggs in the clutch, all of which hatched and 2 chicks took flight.

#### **Wood nuthatch**

A brood was observed during spring 2018. There were 6 eggs in the clutch, all of which hatched and all the chicks took flight.

#### **Tree sparrow**

A brood was observed during spring 2018. There were 3 eggs in the clutch, all of which hatched and all the chicks took flight.

#### **Unidentified or non-recorded species**

Six broods were observed but the name of the species was not identified. This data cannot therefore be used.



## SUMMARY OF 2017-2018

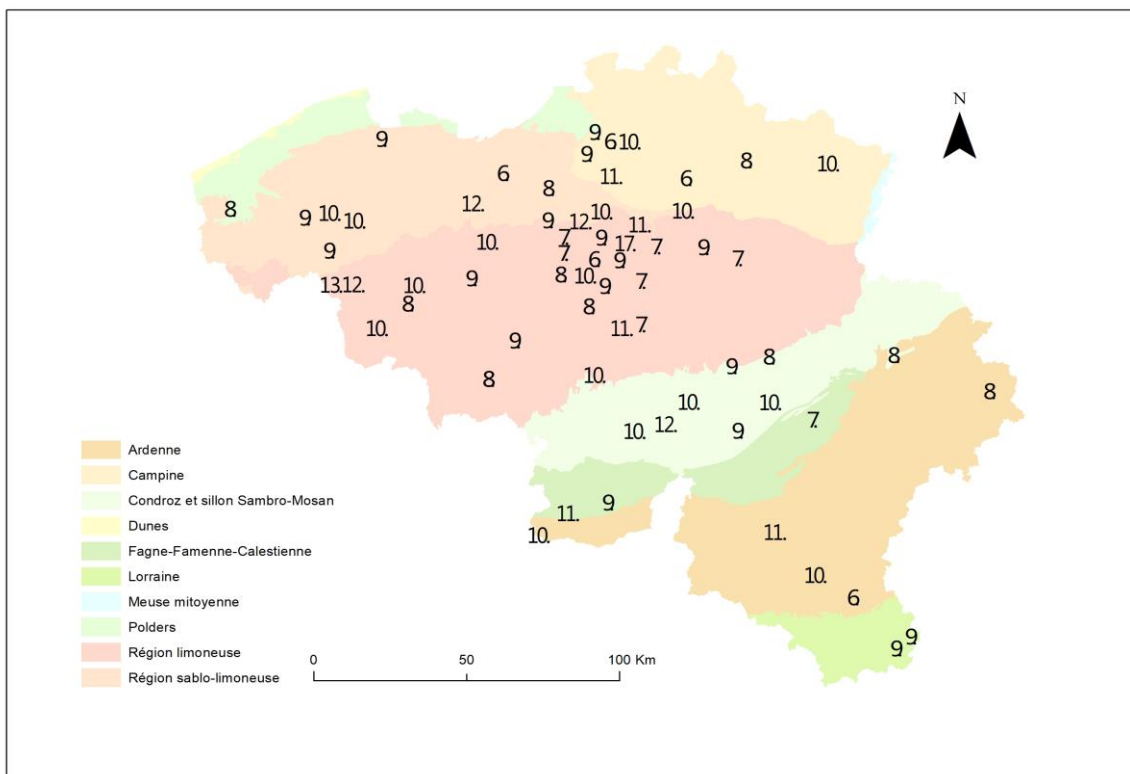
Two springs of observing, 148 broods belonging to 6 species of cavernicolous passerines monitored day-to-day, 1331 eggs counted, 1052 chicks hatched of which 790 successfully took flight, are a fine set of results!

It is obviously a little too early to make in-depth analysis and make findings, but initial calculations can be put forward regarding survival rates, i.e. the number of chicks that have hatched in relation to the number of eggs laid and the number of chicks that have taken flight in relation to the number of chicks hatched. These results are proportions and are therefore expressed in percentages.

As regards great tits, the hatching percentage was 89.5% for 2017 and 75.3% for 2018. The percentage of chicks that survived between hatching and taking flight was 76.6% in 2017 and 78.5% in 2018. When calculations are made of the proportion of young great tits that successfully took flight in comparison to the number of eggs laid, the values obtained are 68.6% for 2017 and 59.2% for 2018.

The first two years of observation have shown that the survival rates are slightly lower among blue tits than among great tits. The hatching percentage was 76.9% in 2017 and 82.6% in 2018. The percentage of chicks that survived between hatching and taking flight was 71.7% in 2017 and 70.5% in 2018, whilst the proportion of young blue tits that successfully took flight in comparison to the number of eggs laid was 55.2% for 2017 and 58.2% for 2018. Naturally, this initial data must be confirmed – or refuted – by observing more broods over the coming years. The analysis should also take account of the geographical distribution of the broods observed..

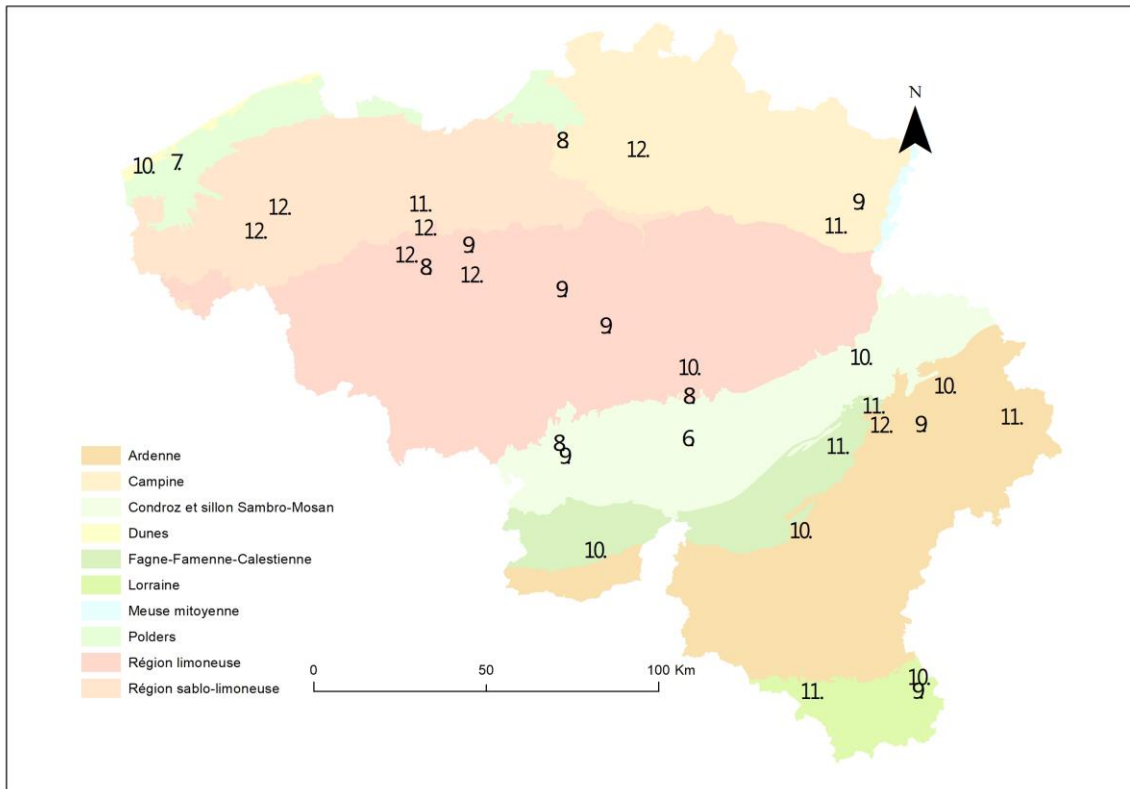
Concerning geography, another dimension of the analysis is cartographical in nature, in order to compare the demographic parameters in relation to the habitat. The following maps denote the size of the clutches of great tits in 2018 according to the bio-geographical regions of Belgium. The characteristics of these regions probably exert an influence on the demography of the birds that we observe. Of course, the characteristics of the immediate surroundings of the site where the nesting boxes are installed are also significant. We hope to be able to continue collecting observations for several more years in order to observe significant correlations and trends.



Distribution of clutch sizes in great tits in 2018 according to the bio-geographical regions of Belgium.







Distribution of clutch sizes in blue tits in 2018 according to the bio-geographical regions of Belgium.

The data collected thanks to observation, via the camera, of broods of cavernicolous passerines are also useful for the study of nesting phenology, i.e. the schedule of events. In this case once again, the comparison of data and the study of its long-term change is a major advantage of the XperiBIRD.be programme. Consequently, in 2017, the average date on which the first egg was laid by couples of great tits under observation was 10<sup>th</sup> April. In 2018, the average date was 19<sup>th</sup> April, which is quite a difference! Such a variation was not observed in blue tits, because the average date on which the first egg was laid in 2017 was 17<sup>th</sup> April and in 2018 it was 19<sup>th</sup> April.

To be continued!

