

**Ministry for Sustainable Development, the Environment and
Climate Change**

**Report on a survey of the influx of migratory finches over the
Maltese Islands, made between October and December 2014**

Prepared by



12, Sir Arthur Borton Street
Mosta, MST1881
MALTA

Telephone: (+356) 2143 1900
Fax: (+356) 21424 137
e-mail: info@ecoserv.com.mt

www.ecoserv.com.mt

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This report has been compiled by:

JOSEPH A. BORG

BSc MSc PhD (Plymouth) CBiol MSB MMBA FIBMS

JULIAN EVANS

BSc (Hons) MSc PhD (Plymouth) MMBA

NATALINO FENECH

Dip (Journalism), BA, PGCE, PhD (Dunelm)

Coordinator of study logistics:

SARAH DEBONO

BSc (Hons) MSc



Report checked by:

Julian Evans BSc(Hons) MSc PhD
MMBA



Report approved by:

Joseph A Borg BSc MSc PhD CBiol MSB
MMBA FIBMS

1. Introduction

1.1 Preamble

The Ministry for Sustainable Development, the Environment and Climate Change (hereafter 'MSDEC') issued a call for tenders (reference: MSDEC Tender 53-2014) on the 13th June 2014 titled "*Service tender for an independent scientific study on the influx or passage of migratory Finches in Malta during the 2014 Autumn/Winter season*". The Terms of Reference (ToR) specified in the tender document are as follows:

8.1 Contract Objectives and Expected Results

8.1.1 Overall Objectives

The overall objective of the contract is:

- *To provide an independent study on the influx or passage of the 7 finch species: Linnet (Carduelis cannabina), Chaffinch (Fringilla coelebs), Serin (Serinus Serinus), Goldfinch (Carduelis carduelis), Greenfinch (Carduelis chloris), Hawfinch (Coccothraustes coccothraustes) and Siskin (Carduelis spinus) during the Autumn/Winter 2014 migration period.*

8.2.2 Specific Objectives

The objectives of this contract are as follows:

- *To survey and scientifically monitor the daily influx of all the 7 species of finches;*
- *To estimate the overall presence (influx) of these seven species per day and for the whole study period, subject to scientifically justified assumptions;*

Should the government decide to apply finch live-capturing derogation in Autumn 2014, the findings of the study will assist the Contracting authority in providing additional verification mechanism for assessing the numbers of finches reported trapped via Carnet de Chasse and SMS data.

8.2.3 Results to be Achieved by the Consultant

The tender results are the following:

1. *Daily datasheets with raw counts for each of the 7 finch species (Linnet Carduelis cannabina, Chaffinch Fringilla coelebs, Serin Serinus Serinus, Goldfinch Carduelis carduelis, Greenfinch Carduelis chloris, Hawfinch Coccothraustes coccothraustes and Siskin Carduelis spinus);*
2. *A monitoring report for Autumn/Winter 2014 finch migration season which must include:*
 - a) *List of monitoring stations which recorded high/low counts*
 - b) *Dates which showed high/low peaks in the migration of each of the 7 finch species*
 - c) *A daily estimate of the influx of the 7 finch species for the whole of the Maltese Islands*
 - d) *The estimated total influx for these species for the whole of the study period, subject to scientifically justified assumptions*

- e) *A comparative analysis of the results obtained with the bag data extracted from Carnet de Chasse for the same period between 2002 and 2008. Relevant Carnet de Chasse reports for the periods 2002-2008 are available on: <http://www.mepa.org.mt/biodiversity-reporting>.*

8.3. Assumptions and Risks

8.3.1 Assumptions Underlying the Project Intervention

For the purposes of this bird migration study, it will be assumed that the consultant shall use the daily counts obtained from the monitoring stations to extrapolate the approximate estimate of the total influx of each of the 7 species of finches (Linnet Carduelis cannabina, Chaffinch Fringilla coelebs, Serin Serinus Serinus, Goldfinch Carduelis carduelis, Greenfinch Carduelis chloris, Hawfinch Coccothraustes coccothraustes and Siskin Carduelis spinus) over the Maltese Islands during the period stipulated in Clause 8.4.1.1.

Moreover, it shall also be assumed that the passage of birds at different localities is extremely variable and may be subject to local topographic, anthropogenic, climatic and other conditions which are to be taken into account in the appropriate extrapolation methods that shall be used to estimate the total influx of the species concerned.

8.3.2 Risks

Execution of the bird migration study is dependent on an adequate enrolment of the ornithologists/ field assistants who shall be manning the monitoring stations (at least 24 in number). It shall be the responsibility of the consultant to ensure that the active monitoring stations are manned by a sufficient number of ornithologists and/or field assistants. The numbers and location of the monitoring stations, as well as the level of personnel deployed in each station should be consistent with the corresponding parameters deployed in past studies of this nature in Malta.

The consultants shall propose strategies to address the identified risks. These proposals shall be included in the tenderer's technical offer in Part 9 Section 9.2.

The award of this tender and hence the undertaking of this bird migration study is dependent on a decision by the Government of Malta to apply a derogation for the live-capturing of Finches in Autumn 2014. The award of the tender may be cancelled if no such derogation is applied. Provided that this tender shall in no way be construed or perceived as obliging the Government or any other relevant authority to take a decision applying a derogation for the Autumn 2014 live-capturing season.

8.4 Scope of the Work

8.4.1 General

8.4.1.1 Project Description

The monitoring of the influx or passage of the 7 species of finches (Linnet Carduelis cannabina, Chaffinch Fringilla coelebs, Serin Serinus Serinus, Goldfinch Carduelis carduelis,

Greenfinch Carduelis chloris, Hawfinch Coccothraustes coccothraustes and Siskin Carduelis spinus) shall take place during the period between the 20th October 2014 and the 31st December 2014 both dates included. The consultant shall mobilise all staff and equipment by the end of September, in preparation for the execution of Autumn/Winter2014 finch migration study.

The bird migration study should comprise the on-field surveying and scientific monitoring of the daily influx of migration of all 7 species concerned. This would provide an independent verification of the level of presence of the seven species in Autumn/Winter and the timing of their migration. This shall be achieved by generating a "Migration Count," that is a count of migrant birds of each species in question in the stipulated time span when monitoring is undertaken.

The collection of scientific data to elucidate general population trends for both species is beyond the scope of this bird migration study. The consultant must submit the daily datasheets with raw counts to the Contracting Authority at the end of each week. The draft monitoring report and analysis is to be submitted by the 15th of January 2015.

Once the draft Autumn/Winter 2014 Finch Migration monitoring report has been certified for quality assurance by the Contracting Authority, the final Autumn/Winter 2014 Finch Migration monitoring report is to be submitted within 10 working days from such a review.

8.4.1.2 Geographical Area to be covered

The three inhabited islands of the Maltese archipelago, namely Malta, Gozo and Comino.

8.4.1.3 Target Groups

Not applicable

8.4.2 Specific Activities

The bird migration study shall monitor the influx of migratory specimens of Linnet Carduelis cannabina, Chaffinch Fringilla coelebs, Serin Serinus Serinus, Goldfinch Carduelis carduelis, Greenfinch Carduelis chloris, Hawfinch Coccothraustes coccothraustes and Siskin Carduelis spinus, bearing in mind any methodological and physical limitations in the monitoring of these species, such as ability to identify or differentiate species of finches on the basis of their call rather than appearance. A field protocol of standard operating procedures, which will be used in the same manner from day to day should be designed by the commissioned experts on the basis of best practice procedures. There might be a need to take into consideration however, the flexibility of the techniques used to meet the constraints imposed by local geographical conditions.

A network of monitoring stations will need to be set up throughout the three inhabited islands of the Maltese archipelago for the study period. Such a network would need to comprise at least 24 monitoring stations. Each of these monitoring stations shall be operated on at least once weekly and manned by at least two ornithologists and/or field assistants. The number of active stations on any given day shall be at least 6. Monitoring in Malta, Gozo and Comino shall be carried out on a daily basis, however this requirement shall be waived with respect to Comino on those days when access to the Island would not be possible due to adverse weather conditions. The ornithologists and/or field assistants shall be persons with

relevant experience in bird identification and shall have the capacity to identify all of the 7 species of finches visually but most importantly being able to recognise their call in flight. In view of the likely (albeit not exclusive) occurrence of finches being during daylight hours, daily monitoring at each station shall be conducted from 10:00hrs to 15:00hrs during the first six days of the study (20 October–25 October) and from 09:00hrs to 14:00hrs during the 26 October–31 December study period to factor in the Daylight Saving Time, which ends on 26 October.

For each day during the bird monitoring phase, at least 6 monitoring stations must be fully manned. The exact number, location and area of the monitoring stations will be determined in consultation with scientific experts who are commissioned to undertake this bird migration study. Given that the survey is aimed at quantifying the influx or passage of migrating specimens, all monitoring stations shall be placed in strategic locations depending on the species being surveyed and the expected geographical occurrence of the species depending on the timing of the migration and prevailing weather conditions. The location of the monitoring stations shall be selected with care and shall not include areas where the settlement or sighting of the finches under study cannot in practice occur.

Each, monitoring station should include or encompass a defined ‘count area’ that has features that are compatible with the chosen count procedures. Moreover, no matter the type of method, the experts should also define the total daily ‘count period’, as well as the standard daily time periods during which the various component activities of bird counting procedures occur.

Surveys should focus on observations made, and should be coordinated by the Project co-ordinator or/and scientist/s, so as to enable an appropriate scientific determination with ecological statistics and/or models leading to population estimates (possibly through the extrapolation of results, with standard errors being indicated) and should cover, at least, the three main inhabited islands of the Maltese archipelago. The migration count can include birds counted at a site, observed flying past a fixed point in diurnal migration or alighting onto the ground or trees. For monitoring small landbirds, particular attention should be drawn to birds observed at short-term stopover sites immediately following a migratory flight. There are several options for producing a useful migration count of small landbirds; these options include: visible migration count; area search or route census counts; incidental observations; and daily estimated totals. The commissioned experts should define in the final monitoring report what they will consider as a migration count and what standardised methods will be used.

Nonetheless, in view that the finch species under study have a preference for migrating during particular times of day, observations should focus on such peak times. In this respect the monitoring is to be carried out from 10:00hrs to 15:00hrs during the first six days of the study (20 October–25 October) and from 09:00hrs to 14:00hrs during the 26 October–31 December study period to factor in the Daylight Saving Time, which ends on 26 October.

The consultant may also propose a variation to such methodology, but this shall not take effect unless previously agreed with and confirmed in writing by the Contracting Authority and shall in any case not involve any trapping or any taking of any bird, whether alive or dead, nor any part of any bird. It is imperative that the observers, or persons deployed by the consultant to man the stations and/or conduct counts or observations for the purpose of this study shall not be directly or indirectly be involved with the practice of live-capturing or hunting.

Standardisation of counting methods can make a major contribution to removing extraneous variation derived from variable observer effort and sampling procedures. Nevertheless, migration counts will still be subject to uncontrollable variation from weather, observer differences, and unavoidable changes in the level of effort. Such problems should be addressed by the use of appropriate analytical procedures.

Daily datasheets with raw counts need to be drawn for each of the monitoring stations in use, such that the prevalent meteorological conditions, namely wind direction and speed, the degree of cloud cover; the habitat type; bird counts; the times and locations; and the names of the field assistants, are all recorded.

The count data collected for a pre-defined area and the count period at each study site shall be used to establish the average counts (per day) recorded in a typical monitoring station for each of the 7 species of finches. The calculations for such counts also need to include the standard deviation errors. Such mean counts shall then be extrapolated so as to cover the total area where the species may settle / which serves as short-term stopover sites, in order to estimate the total number of birds migrating daily over the Maltese Islands.

The appropriate methodology for extrapolation shall be determined by the scientific experts taking into account the possibility of repeat counting of observed birds; the patchiness of each species' distribution and frequency depending on available appropriate habitat; the seasonal geographical variation in the frequency of sightings dependent on the expected migration flow direction and any assumptions taken for such calculations need to be clearly stated in the monitoring report.

Relevant seasonal, local topographic (e.g. configuration of the coast), climatic and anthropogenic factors (such as degree of local urbanization) shall be duly taken into account in the extrapolation methodology, subject to scientifically justified assumptions.

The methodology shall not involve trapping or any taking of any bird, whether alive or dead, nor any part of any bird.

The field study shall cover 73 days during the Autumn/Winter migration period, between the 20 October 2014 and the 31 December 2014. The collection of scientific data to elucidate population trends for each finch species is beyond the scope of this bird migration study. The consultant must submit the daily datasheets with raw counts to the Contracting Authority at the end of each week of each of the bird monitoring periods. The Autumn/Winter 2014 Finches Migration monitoring report and analysis is to be submitted by the 15 January 2015. Once such draft report has been certified for quality assurance by the Contracting Authority, the Finches Migration 2014 monitoring report is to be submitted within 10 working days from such a review. All Autumn/Winter 2014 project activities must be completed to the Contracting Authority's satisfaction by five weeks from the termination of the Autumn/Winter finch monitoring phase.

These activities will result in:

- 1. Daily datasheets with raw counts for each of the above mentioned species of finches*
- 2. A monitoring report for the season.*

8.4.3 Project Management

8.4.3.1 Responsible Body

The overall responsibility of the implementation of this contract lies with the Contracting Authority. An official will be appointed to oversee the implementation of the contract.

8.4.3.2 Management Structure

The Head of the Wild Birds Regulation Unit within the Ministry for Sustainable Development, the Environment and Climate Change is the official responsible for this contract. The Head may delegate various tasks to other officials within the Wild Birds Regulation Unit and may appoint an official to act as a project manager and to monitor the progress of this project.

8.4.3.3 Facilities to be provided by the Contracting Authority and/or other parties

None

8.5. Logistics and Timing

8.5.1 Location

The Republic of Malta. The monitoring stations shall be set up at appropriate locations within the three inhabited Maltese Islands, namely in Malta, Gozo and Comino.

The contractor, moreover, is expected to compile reports, prepare scientific analysis, and prepare the setup of the administrative framework from his own premises. The contractor should be available during office hours via e-mail and telephone.

8.5.2 Commencement Date & Period of Execution

The intended commencement date is the date of signature of the contract and the period of execution of the contract will be 2 months from this date.

8.6. Requirements

8.6.1 Personnel

8.6.1.1 Other Experts

CVs for experts other than the key experts are not examined prior to the signature of the contract.

The Consultant shall select and hire other experts as required according to the profiles identified in the Organisation & Methodology and these Terms of Reference. For the purposes of this contract, international experts are considered to be those whose permanent residence is outside the beneficiary country while local experts are considered to be those whose permanent residence is in the beneficiary country.

The Consultant should pay attention to the need to ensure the active participation of local professional skills where available, and a suitable mix of international and local staff in the project teams. All experts must be independent and free from conflicts of interest in the responsibilities accorded to them.

The selection procedures used by the Consultant to select these other experts shall be transparent, and shall be based on pre-defined criteria, including professional qualifications, language skills and work experience. The findings of the selection panel shall be recorded. The selection of experts shall be subject to approval by the Contracting Authority.

Note that civil servants and other staff of the Public Service of the beneficiary country cannot be recruited as experts. See sub-article 9.5 of the General Conditions.

8.6.1.2 Support Staff and Backstopping

- *The bird migration study is to be supported by ornithologists or field assistants with relevant experience in bird identification.*
- *Other support staff should be capable in carrying out statistical analysis, report writing and/or other relevant administration work.*

8.6.2 Accommodation

Office accommodation of a reasonable standard and of approximately 10 square metres for each expert working on the contract is to be provided by the Consultant.

8.6.3 Facilities to be provided by the Consultant

The Consultant shall ensure that experts are adequately supported and equipped. In particular it shall ensure that there is sufficient administrative, secretarial and interpreting provision to enable experts to concentrate on their primary responsibilities. It must also transfer funds as necessary to support its activities under the contract and to ensure that its employees are paid regularly and in a timely fashion.

The contractor shall provide the equipment, software and hardware needed for carrying out surveys, data gathering, storage, analysis and evaluation.

If the Consultant is a consortium, the arrangements should allow for the maximum flexibility in project implementation. Arrangements offering each consortium partner a fixed percentage of the work to be undertaken under the contract should be avoided.

8.6.4 Equipment

No equipment is to be purchased on behalf of the Contracting Authority as part of this service contract or transferred to the Contracting Authority at the end of this contract. Any equipment related to this contract which is to be acquired by the beneficiary country must be purchased by means of a separate supply tender procedure.

The contractor shall be responsible for establishing his own sources for goods, equipment, materials and software to perform the necessary activities and tasks, which may include:

- *Field Monitoring equipment, as appropriate e.g. binoculars, compass (to measure wind direction), radar equipment etc.*

- *Research equipment*

8.7. Reports

8.7.1 Reporting Requirements

(Please refer/peg to Article 26 of the Special/General Conditions)

Daily data sheets with raw counts need to be drawn for each of the monitoring stations in use, such that the prevalent meteorological conditions, namely wind direction and speed, the degree of cloud cover, the habitat type, bird counts, the times and locations, the names of the field assistants all need to be recorded.

Following the survey/study period a detailed analysis shall be carried out on the data collated which are to be presented in a Report. Such a report is to indicate:

- *the raw counts*
- *sampling methodology used*
- *the time schedule for the monitoring taken place*
- *the locations where monitoring was carried out and the estimated area of each site of observation*
- *the peak and low counts for each of the species under study*
- *the locations/monitoring stations which had peak/low counts*
- *an extrapolation indicating the total influx of each of the 7 finch species migrating over the Maltese Islands for each day*
- *an estimated total influx of each of the 7 finch species for the whole study period*
- *assumptions taken for such estimates*

This report should only concern information/data on the influx of the migratory finches and should not include personal opinions of the consultant.

The consultant must submit the daily datasheets with raw counts to the Contracting Authority at the end of each week during the finch monitoring phase. The draft Autumn/Winter 2014 Finch Migration monitoring report and analysis is to be submitted by the 15 January 2015.

Once such draft report has been certified for quality assurance by the Contracting Authority, the final Autumn/Winter 2014 Finch Migration monitoring report is to be submitted within ten working days from such a review. All Autumn/Winter 2014 finch monitoring activities must be completed to the Contracting Authority's satisfaction within five weeks from the termination of the bird monitoring phase.

All reports and other forms of written communication must be presented in an editable format using commonly available software. All reports must be approved by the Contracting Authority before these can be considered finalised. All reports will be property of the Contracting Authority and it will have sole copyright.

8.7.2 Submission & approval of progress reports

The daily data sheets with raw counts and 2 hard copies and a soft copy of each of the monitoring reports referred to above must be submitted to the Project Manager identified in the contract. The raw datasheets and the report must be written in English. The Project Manager is responsible for approving the draft monitoring report.

8.8 Monitoring and Evaluation

8.8.1 Definition of Indicators

Results	Objectively verifiable indicators	Sources of verifications
<i>Daily datasheets with raw counts of Linnet <i>Carduelis cannabina</i>, Chaffinch <i>Fringilla coelebs</i>, Serin <i>Serinus Serinus</i>, Goldfinch <i>Carduelis carduelis</i>, Greenfinch <i>Carduelis chloris</i>, Hawfinch <i>Coccothraustes coccothraustes</i> and Siskin <i>Carduelis spinus</i></i>	<i>The original raw datasheets which are to be completed on site during the monitoring process to be submitted by the end of each week of the monitoring phase.</i>	<i>The original datasheets submitted to the Contracting Authority.</i>
<i>Autumn/Winter 2014 Finch migration monitoring report which presents a clear analyses of the monitoring carried out</i>	<i>The draft monitoring report shall be completed within the 15 January 2014.</i> <i>The monitoring report will be finalised by the consultant and approved by the Contracting Authority within five weeks from the termination of the finch monitoring phase.</i>	<i>The actual monitoring report presented by the contractor.</i>

8.8.2 Special Requirements

Not applicable

Ecoserv Ltd (hereafter 'Ecoserv') made a submission and was subsequently informed by the MSDEC that its bid was successful and, as a result, was awarded the tender.

The present submission constitutes Ecoserv's report of the independent scientific study on the influx of migratory finches (Linnet *Carduelis cannabina*, Chaffinch *Fringilla coelebs*, Serin *Serinus Serinus*, Goldfinch *Carduelis carduelis*, Greenfinch *Carduelis chloris*, Hawfinch *Coccothraustes coccothraustes* and Siskin *Carduelis spinus*) in Malta, undertaken by the company during the period 20 October to 31 December 2014, which coincides with the 2014 autumn/winter live-capturingli season, and is based on the ToR stated above.

In order to set the scene and put the present study into perspective, a review of migratory behaviour of the seven finch species, as well as an overview of local bird live-capturing activities, and EU legislation on the latter, is presented hereunder. No similar studies on the 7 finch species have been previously undertaken locally. However, records of the number of finch individuals caught by live-capturers between 2001 and 2008 are available in the *Carnet de Chasse* reports for the respective years, and are available from the Malta Environment and Planning Authority (see <http://www.mepa.org.mt/biodiversity-reporting>).

1.2 Status and migratory behaviour of finches recorded from Malta

The Western Palearctic supports 35 species of finches (Cramp & Perrins 1994, Beaman 1996). Of these, 14 have been recorded from Malta: Linnet *Carduelis cannabina*, Chaffinch *Fringilla coelebs*, Serin *Serinus serinus*, Goldfinch *Carduelis carduelis*, Greenfinch *Carduelis chloris*, Hawfinch *Coccothraustes coccothraustes*, Siskin *Carduelis spinus*, Brambling *Fringilla montifringilla*, Eurasian Bullfinch *Pyrrhula pyrrhula*, Common Rosefinch *Carpodacus erythrinus*, Twite *Carduelis flavirostris*, Common Redpoll *Carduelis flammea*, Common Crossbill *Loxia curvirostra* and Trumpeter Finch *Bucanetes githaginea*. Only the first seven occur regularly, while there are records of breeding for five finch species; namely Linnet, Chaffinch, Serin, Greenfinch and Siskin (Fenech, 2010).

Some of the finches are migratory, undertaking regular flights to and from their breeding grounds. Others are irruptive and disperse in search of food, and may undertake long flights, even across large bodies of water, in search of food. Bird migration is influenced by many factors, but geographical and evolutionary aspects are probably the most important.

Data from birds ringed abroad and recovered in Malta shows that most of the finches seen locally in autumn originate mainly from Eastern Europe. Analysis of the available data on ringed finches shows that a total of 79% of the recovered in Malta would have originated from north-eastern and eastern European countries; 10.5% originate from northern Europe, while another 10.5% originate from northwestern Europe (Raine, 2007, Fenech, 2010).

Halmos & Tibor (1991) contend that where partial migrants and irruptive species are concerned, their migratory pattern is more difficult to interpret as their migration routes are not well defined and flight speed is low. This is because such species change from an animal diet to a plant diet during the winter. The birds do this to survive at northern latitudes and in very adverse weather conditions, while movement of these species is almost entirely controlled by the quantity of available food (Berthold, 1984; Alerstam, 1993).

Alerstam (1993) notes that birds which feed on seeds produced by trees and bushes do not show fidelity to fixed winter quarters. This is because trees and bushes may produce a quantity of seeds and berries in one year and produce less of the same in the next. Birds that are dependent on seeds produced by trees such as spruce, alder and birch, lead a nomadic winter life; sometimes such birds allow their varying migration routes to be determined by the direction along which the wind makes it most economical and quickest to fly. Since the winds vary, the same bird can seek its winter food in west Europe in one year and in east Europe in the next. Hence, species such as Siskin and Hawfinch move to places where their favourite food abounds.

On the other hand, birds such as Linnet and Serin that feed on seeds produced by herbaceous plants are more faithful to their wintering grounds. Herbaceous plants are short-lived and produce a large number of seeds to ensure survival of their species. Despite their short lifespan in an unstable environment, herbaceous plants offer seed-eating birds a fairly stable food year after year. In areas where the supply of weed seeds is abundant in one year, there is a strong probability that it will be so also during the following year. Thus, birds which feed on weed seeds in winter exhibit stable and regular migratory habits in site fidelity in their wintering quarters (Alerstam, 1993).

This may account for the observation that certain species of finches, such as Siskin, tend to be very common locally in some years but very rare in others; the different bird species differ in their origin and destination, while weather conditions affect each species differently, even along a given route. In some years, most of the bird species may remain in Europe and not migrate across the Mediterranean. In other times, they are compelled to make the crossing.

As the present study focuses on the seven finches that regularly visit Malta, namely Linnet, Chaffinch, Serin, Goldfinch, Greenfinch, Hawfinch and Siskin, this introductory chapter will consider these species in more detail.

The peak migration time for finches is between 20 October and 20 November, and all seven species of finches are recorded locally during this period. However, some species appear earlier. Hawfinch, Chaffinch and Siskin start to appear in September, while Greenfinch is the last to appear during the autumn migration (Fenech, 2010).

Finches have different migration patterns; in October Siskin may appear before dawn, but usually other finch species appear between 08:00 and 14:00. The peak period for finch migration in October is from around 08:00 till 11:00. In autumn, the most favourable winds for finches to migrate are southeast, northeast and north. Finches keep appearing till end January, but from December onwards it is mostly Linnet and Serin that are recorded. Linnet appears again at the end of February and in March. A small number of Greenfinch, along with Chaffinch and Serin, appear in spring, particularly in April (Fenech, 2010).

Linnet

The Linnet is a partial migrant; individuals of this species that breed in West Europe migrate southwards to North Africa over the Iberian Peninsula along a narrow front (Cramp & Perrins, 1994). Linnet from the area between Finland through Poland to Hungary migrate to the Apennine peninsula, while some individuals originating from these same European regions also migrate to Malta.

The nominate race *Carduelis cannabina cannabina*, the eastern race *Carduelis cannabina bella* and the race *Carduelis cannabina mediterranea* have all been recorded locally, while the latter race is the one that breeds in Malta (Fenech, 2010). The nominate race *cannabina* occurs in Europe and western Siberia, west to Ireland, Wales, and England, and in the Pyrenees, northern Italy, northern Serbia and Croatia, Rumania, Ukraine and northern Kazakhstan. The race *bella* occurs in Crimea, Turkey, east through the Caucasus area and northern Iraq to Iran, and central Asia from Afghanistan to south-west Altai Mountains. The race *mediterranea* occurs in Iberia, the Balearic Islands, Corsica, Sardinia, Sicily, southern Italy, coastal and southern Balkans, Albania, Bulgaria and Greece. The race that breeds in the Maghreb countries has not yet been named but individuals do not appear to belong to the race *mediterranea*; these have a dark plumage, short wings and heavy beaks (Isenmann *et al.*, 2005). Individuals ringed in Lithuania, the Czech Republic, Slovakia, Hungary, Croatia, Poland, Slovenia, Switzerland, Austria and Italy, have been recovered in Malta (Raine, 2007; Fench 2010).

Goldfinch

The Goldfinch breeds in places located across Europe, North Africa, and western and central Asia. It is resident in the milder west of its range, but migrates from colder regions and also undertakes local movements to avoid adverse weather. The species is essentially a partial migrant, with European populations spending the winter in different parts of the Mediterranean region (Cramp & Perrins, 1994).

Individuals of this species that breed in the British Isles, France and Germany, migrate to the Iberian Peninsula. A minority of individuals that breed in western Europe migrate across the Strait of Gibraltar to African wintering grounds (Asensio, 1986). There is a migratory divide at 10° E, and individuals that breed in places east of this line migrate on a broad front along a south-southwest direction to the Balkan region, where Goldfinch is very common in winter from the Dalmatian coast to the southern islands (Cramp & Perrins, 1994; Zink, 1995). Only a small number of individuals of

this species winter on the Apennine peninsula (Schubert *et al.*, 1986). In Malta, the Goldfinch appears in small numbers from mid-October to mid-April. It has also been recorded in May, June and July.

Birds of the nominate race *Carduelis carduelis carduelis* and the race *Carduelis carduelis tschusii* have been recorded locally. Individuals of the nominate race breed in much of central Europe and from its west to its east parts, whereas the race *tschusii* breeds in Sardinia, Corsica, Sicily and the Tuscan isles. Birds belonging to the Afghan race *Carduelis carduelis paropanisi* have also been recorded locally. There are only four ringing recoveries of Goldfinch: one each from England, Germany, Croatia and Tunisia (Raine 2007, Fenech, 2010).

Greenfinch

The Greenfinch is a partial migrant in most of its breeding range. Resident individuals occur even in the northernmost parts of Scandinavia, but only individuals of the southernmost populations are fully resident (Cramp & Perrins, 1994). Greenfinches winter throughout the Mediterranean. Birds from Scandinavia and the Baltic states migrate along a southwesterly narrow front, and spend the winter along the northern coasts of Europe to Iberia in the south. Populations in western Europe migrate along a southwesterly direction to the Iberian Peninsula. Individuals breeding in Switzerland and Germany disperse over a wide area from the Iberian Peninsula to Northern Italy during the winter, but the majority migrate to the Apennine Peninsula. Birds breeding in the northeast migrate to the Baltic areas, while those from southern areas migrate to the Balkan Peninsula and cross the Mediterranean (Cramp & Perrins, 1994).

In Malta Greenfinch is a common autumn migrant and winter visitor, occurring from early October to mid-April, but which appears in smaller numbers in spring, and it has been recorded breeding a number of times. The nominate race *Carduelis chloris chloris* and *Carduelis chloris aurantiiventris* occur. The nominate race *chloris* occurs in northern Europe from Belgium, The Netherlands, and Scandinavia east to Urals, south through the Rhine Valley to the northern slope of the Alps, Hungary, Ukraine and European Russia. The race *aurantiiventris* is present south of the Loire Valley in France, Spain, Balearic Islands, northern Tunisia, Sicily, mainland Italy, Croatia, Albania, and western Greece. Greenfinch ringed in Slovenia, Hungary, Croatia, Slovakia, Italy and Germany have been recovered in Malta (Raine, 2007, Fenech, 2010).

Siskin

Northern populations of Siskin are migratory while southern ones are resident (Cramp & Perrins, 1994). Individuals can follow different wintering strategies; while some individuals of the Siskin population show nomadic behaviour throughout the winter, other individuals remain faithful to the wintering site (Senar *et al.*, 1990, 1992). The European migration routes of Siskin have not been clearly defined, but some tendencies have been noted. In Norway, Siskin usually spend the winter in more western areas than individuals of the same species do in Finland. Individuals from the southern parts of Finland migrate over the Baltic region and winter in a large area that extends from the Iberian Peninsula and France to Northern Italy (Payevsky, 1994).

In Malta, the Siskin is a frequent migrant that appears from mid-October to late December, and some individuals may remain in Malta up to March, when some return migrants may also be seen. In some years, Siskin can be rather common while it may be scarce in others.. Fenech (2010) reports local recoveries of Siskin ringed in Kaliningrad (Russia), Croatia, Switzerland, The Netherlands, Czech Republic, Latvia, Italy and Germany, while Raine (2007) reports recoveries of individuals of this

species that were ringed in the Czech Republic, The Netherlands, Russia, Scotland, Slovenia, Switzerland, Italy, Norway and Latvia.

Hawfinch

The Hawfinch is mostly resident in Western Europe. Only a small part of the population is migratory. The North and Central European populations are partial migrants with a typical south-southwest migration (Cramp & Perrins, 1994). Some of the individuals from Central European can reach North Africa during the winter, but the most important wintering areas are the Iberian Peninsula, southern France and northern Italy (Asensio, 1990; Cramp & Perrins, 1994). The western basin of the Mediterranean region is the centre of wintering areas of the European populations. Populations in Eastern Europe spend the winter in Ukraine, Crimea and Caucasus.

The Hawfinch is a frequent spring and autumn migrant. A few individuals of this species attempt to winter locally. Hawfinch appears in Malta from late September to late February, while some birds also appear in March and April. The Hawfinch tends to be scarce in some years and commoner in others. Very large numbers can sometimes be recorded (Fenech, 2010).

Chaffinch

The South European populations of Chaffinch are resident, but the different populations in the northern and eastern regions of Europe are more migratory (Cramp & Perrins, 1994). The direction of migration changes between west and south. The usual direction of the North and West European populations is southwest (Pedreck, 1970; Hecke & Verstuyft, 1972). Scandinavian birds spend the winter in an area spanning from Denmark and Germany to Britain, while the population in Russia winters along the Baltic Coast. Birds breeding in Germany and Switzerland migrate to the western Mediterranean area, while East European birds spend winter in the northern parts of Italy (Cramp & Perrins, 1994). The breeding population of the Czech Basin winters in the south of France, while the Slovakian population spends winter in northern Italy (Hajek & Basová, 1960;; Cramp & Perrins, 1994).

In Malta, the Chaffinch is a common autumn migrant and winter visitor. It is seen in smaller numbers in spring. Chaffinch is mostly seen locally from early October to early April. A few may be seen in September and May.

The nominate race *Fringilla coelebs coelebs*, and *Fringilla coelebs spodiogenys* and *Fringilla coelebs africana* have been recorded locally (Fenech 2010). The nominate race occurs from Scandinavia, Netherlands, and France east to central Siberia, south to the Pyrenees, and in mainland Italy, Balkan countries, Greece, Crete, Turkey, Ukraine and European Russia. The race *spodiogenys* occurs in parts of Tunisia and in northwest Libya, while the race *africana* occurs from Morocco to northwest Tunisia. Fenech (2010) reports that a Chaffinch ringed in Malta was recovered in Tunisia, while individuals ringed in Italy, Hungary and Poland have been recovered in Malta (Fenech, 2010). Raine (2007) reports 7 ring recoveries from Hungary (2), Italy (2), Ukraine (1), Poland (1) and Tunisia (1).

Serin

The Serin is a common autumn migrant and winter visitor, appearing from mid-October to early April. The Serin breeds in areas across southern and central Europe and in North Africa. Individuals that breed in northern Europe migrate further south in Europe for the winter. Fenech (2010) reports that individuals of Serin ringed in the Czech Republic, Hungary and Croatia have been recovered in Malta, while Raine (2007) refers to local recoveries of individuals of this species from the Czech Republic, Slovenia and Croatia.

2. Methodology

Field procedure

The survey design used by Ecoserv during the present autumn/winter 2014 survey is aimed at assessing changes in migratory influx, which entails trend analysis based on data from monitoring carried out regularly over a sufficiently long period comprising subsequent years, and using a similar methodology to that used by Ecoserv to monitor the migratory influx of other (non-finch) species (Ecoserv, 2011; 2012; 2013; 2014). During the survey, two individuals - a field assistant capable of identifying Finch species and an observer who was responsible for recording of data in the field - were stationed at a total of 21 sites (= count stations) distributed over Malta, Comino and Gozo. The survey was undertaken over an 11 week period between 20 October and 31 December, 2014. During the survey, counts of individuals of the seven species (Linnet *Carduelis cannabina*, Chaffinch *Fringilla coelebs*, Serin *Serinus Serinus*, Goldfinch *Carduelis carduelis*, Greenfinch *Carduelis chloris*, Hawfinch *Coccothraustes coccothraustes* and Siskin *Carduelis spinus*) were made at each of 6 different sites on each day during the monitoring period. Each group of 6 sites was surveyed once every 4 days, such that a total of 21 sites were surveyed in total over each period of 4 days, as agreed with the Contracting Authority. The study site at Comino was included in the 6 sites surveyed on any one day, such that this site was surveyed on a daily basis; when weather conditions precluded surveys at the Comino site due to unavailability of sea transport services, these were undertaken at alternative sites (in Armier or Qala) instead. The sampling sites are represented by the grid cell reference numbers listed in Table 1, while their locations are shown in Figure 1.

Since the survey was mainly aimed at quantifying the influx of migrating individuals, field sites were sited at strategic locations behind the coast. For each species, the number of individuals observed flying within each study site was recorded, while the count area was estimated as the area within the observer's field of view when observing horizontally (c. 250m on each side of the observer) and vertically upwards (as far as the birds were detected by sight). Finches are small birds that are difficult to identify when they are flying at a distance, even if binoculars are used. Nonetheless, every effort was made in the present study to identify the species as accurately as possible; to aid the observers detect the birds, field personnel used a pair of binoculars (magnification: 8 x 21). The different species were identified on the basis of their flight pattern and call. When the field personnel had doubt as to the specific identity of a finch species, a '?' was placed next to the record on the field data sheet to indicate the uncertainty. Afterwards, during data analysis (see below), comparison was made of records marked with a '?' from a particular site with records from other sites for the same day as corroboration procedure. Uncertain records were allotted to the species which the field personnel determined as most probable with respect to species identity and which showed agreement with appreciable records from other sites on the same day for that species.

Monitoring of finches was made between 10:00 and 15:00 during the first six days of the study (i.e. up to the date when the daylight saving hour was removed) and between 09:00 and 14:00 during the rest of the study period. The count data collected for the pre-defined area and count period at each study site was used to establish the mean number of birds recorded for each day of the survey.

At each study site, the observers also recorded the prevalent weather conditions, namely wind direction and strength, and degree of cloud cover. This information is available on the raw data sheets, copies of which have been submitted to the Wild Birds Regulation Unit of the MSDEC.

Table 1

List of grid locations where monitoring of influx of migratory birds was carried out.

Location	Day 1	Day 2	Day 3	Day 4
Gozo	3690	3292	2888	3286
Comino	4085	4085	4085	4085
Malta	3881	4079	4077	4073
Malta	4070	4268	4666	5064
Malta	5663	6067	6069	5872
Malta	5277	4878	4480	4283

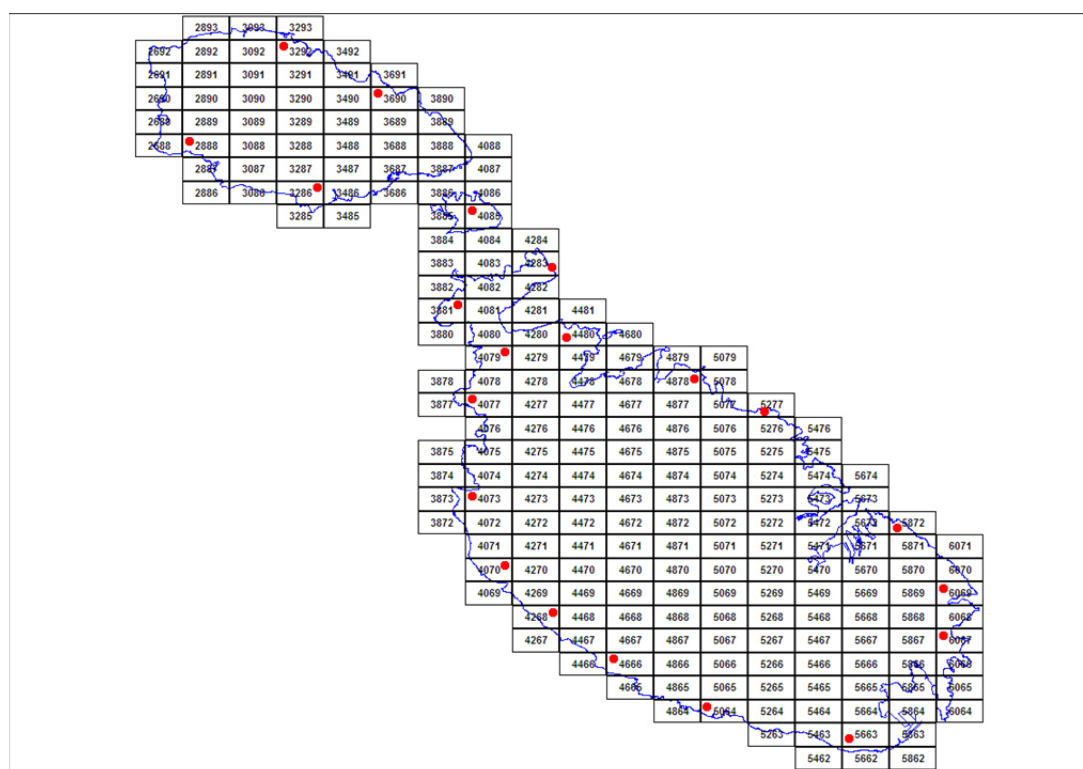


Figure 1. Map of the Maltese Islands showing the localities (grid cells indicated by the red filled circle) where the bird counts were made; see also Table 1.

Data analysis

Using the recorded raw data for each of the seven finch species, estimates were made of the mean daily count and total count for the study period (20 October to 31 December 2014). Values of standard deviation for the respective mean daily counts were also estimated; standard deviation is a measure of variability among counts recorded from the different sites, that is, a low standard deviation implies that very similar counts were recorded at all six sites surveyed during a particular day, whereas dissimilar values would lead to a high standard deviation. Standard deviation is influenced by sample size (i.e. number of study sites); it tends to increase with a decreased sample size.

An estimate of total influx of the respective finch species was made using the daily counts. Extrapolations were then made to obtain the total number of individuals of each species that

migrated over the Maltese Islands on a particular date. However, such an estimate must be treated with utmost caution, given that: (a) migration of finches is not necessarily restricted to that time of the year covered by the present study; (b) the relatively small number of sites used; (c) the counts were not made daily at each site; and (d) bird counts were made while the live-capturing season for finches was open, hence individuals may have been trapped before the field personnel could record them. Being small birds, finches are easy to miss or present difficulty to identify if they pass beyond a certain distance from the observer, and especially if they do not call while in flight. Furthermore, passage of birds at different localities is extremely variable, with potential large differences in birds passing at two different localities, even if these are separated only by a very small distance.

As already stated, another notable limiting factor was that the field survey was stopped in the early afternoon and did not start again before the following morning, hence potentially missing birds that arrive during that time of the day not covered by the present survey, as these would not have been recorded by the field observers. One should also mention that finch migration starts before the period which was surveyed, given that they start migrating from mid-September onwards and hence such birds would not have been included in the present survey of influx of migratory finches. On the other hand, the estimates given in the present report will be useful when making comparisons of data collected from the present study period (autumn 2014) and that collected from future studies held in autumn in subsequent years, assuming that a similar survey design is adopted, to assess whether the trend in influx is increasing or decreasing with time. Since the coastal length surveyed at each site during the present survey is approximately 0.5 km, the mean daily count represents the mean influx of the respective finch species per 0.5 km coastline. The estimated daily influx was obtained by extrapolating the mean daily values obtained (per 0.5 km) to the total coastline length for the Maltese Islands, which have a perimeter of 271.22 km (Mallia *et al*, 2002)¹; that is the estimated daily influx equals the mean daily count multiplied by an extrapolation factor of 271.22/0.5. The values of estimated daily influx were then summed to obtain an estimate of the total influx of the seven species of finches (Linnet, Chaffinch, Serin, Goldfinch, Greenfinch, Hawfinch and Siskin).

3. Results

3.1 Migration study results

Ecoserv's laboratory report reference for the present survey is **024-15**. The sample reference codes for the bird count data are **B-059-14** to **B-205-14**.

Linnet

Raw daily counts for Linnet recorded from the 21 sites during the present study varied between 0 and a maximum of 62 (see Appendix I), while the mean daily counts ranged between 0 and 14.5 (Table 2). During the present (2014) autumn/winter migration, relatively high counts for this species were recorded on some days towards the end of October (25, 26, 29 and 31 October) and on 2, 9 and 15 November. The recorded counts varied appreciably between the different sites: at the lower end, less than 10 individuals were recorded throughout the survey period from each of the sites at grid locations 4878, 4077, 6069, 5872, 3881, 5663 and 5277 (see Figure 1), while at the higher end, 121 and 144 Linnet individuals were recorded from the sites at grid locations 2888 and 4085 respectively.

¹ Note, however, that this estimate includes the perimeter of minor islets and rocks.

Values of mean daily counts and total counts of Linnet recorded during the period 20 October to 31 December 2014 from the present survey are summarised in Table 2. Values of standard deviation associated with the mean daily counts are also provided (Table 2). The general trend noted from the count data is a main migratory influx of Linnet between late October and mid-November (Figure 2).

An estimate of total influx of Linnet over the Maltese Islands is given in Table 2. Based on the mean daily counts (Table 2), extrapolation translates to an estimated daily influx ranging between 0 and 7,865 individuals, with a total influx over the survey period (20 October – 31 December; i.e. 73 days) of 59,126 individuals, i.e. some 810 birds per day; see Table 2.

Mean count values recorded from each of the 21 sites are indicated on the map shown in Figure 3.

Table 2

Values of mean ($\pm$ SD) daily count and daily total count recorded from the six study sites, together with total influx of migratory Linnet.

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
20-Oct-14	0.17	0.41	1	90
21-Oct-14	0.83	2.04	5	452
22-Oct-14	0.33	0.82	2	181
23-Oct-14	0.33	0.82	2	181
24-Oct-14	0.00	0.00	0	0
25-Oct-14	5.67	5.16	34	3074
26-Oct-14	4.00	4.77	24	2170
27-Oct-14	0.67	1.63	4	362
28-Oct-14	2.17	4.83	13	1175
29-Oct-14	9.17	10.59	55	4972
30-Oct-14	3.67	4.13	22	1989
31-Oct-14	8.00	9.65	48	4340
1-Nov-14	2.17	3.13	13	1175
2-Nov-14	14.50	23.56	87	7865
3-Nov-14	3.50	4.72	21	1899
4-Nov-14	2.67	2.25	16	1447
5-Nov-14	1.67	2.07	10	904
6-Nov-14	0.33	0.82	2	181
7-Nov-14	0.33	0.52	2	181
8-Nov-14	1.17	1.33	7	633
9-Nov-14	10.17	6.82	61	5515
10-Nov-14	4.83	7.41	29	2622
11-Nov-14	0.00	0.00	0	0
12-Nov-14	0.67	0.82	4	362
13-Nov-14	2.00	4.90	12	1085
14-Nov-14	0.67	1.21	4	362
15-Nov-14	7.00	10.00	42	3797
16-Nov-14	1.67	2.34	10	904
17-Nov-14	1.33	1.75	8	723
18-Nov-14	1.67	3.20	10	904
19-Nov-14	1.33	2.80	8	723
20-Nov-14	0.00	0.00	0	0
21-Nov-14	2.00	1.90	12	1085
22-Nov-14	1.17	1.60	7	633

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
23-Nov-14	0.67	1.63	4	362
24-Nov-14	1.17	1.33	7	633
25-Nov-14	1.83	2.99	11	994
26-Nov-14	0.33	0.82	2	181
27-Nov-14	0.00	0.00	0	0
28-Nov-14	0.17	0.41	1	90
29-Nov-14	0.33	0.82	2	181
30-Nov-14	0.17	0.41	1	90
1-Dec-14	1.83	2.56	11	994
2-Dec-14	0.50	1.22	3	271
3-Dec-14	0.33	0.82	2	181
4-Dec-14	0.17	0.41	1	90
5-Dec-14	0.83	1.60	5	452
6-Dec-14	0.67	1.03	4	362
7-Dec-14	0.00	0.00	0	0
8-Dec-14	0.00	0.00	0	0
9-Dec-14	0.50	0.84	3	271
10-Dec-14	0.00	0.00	0	0
11-Dec-14	0.00	0.00	0	0
12-Dec-14	1.00	1.67	6	542
13-Dec-14	0.67	1.03	4	362
14-Dec-14	1.17	1.83	7	633
15-Dec-14	0.00	0.00	0	0
16-Dec-14	0.33	0.82	2	181
17-Dec-14	0.00	0.00	0	0
18-Dec-14	0.00	0.00	0	0
19-Dec-14	0.00	0.00	0	0
20-Dec-14	0.00	0.00	0	0
21-Dec-14	0.00	0.00	0	0
22-Dec-14	0.50	1.22	3	271
23-Dec-14	0.00	0.00	0	0
24-Dec-14	0.00	0.00	0	0
25-Dec-14	0.00	0.00	0	0
26-Dec-14	0.00	0.00	0	0
27-Dec-14	0.00	0.00	0	0
28-Dec-14	0.00	0.00	0	0
29-Dec-14	0.00	0.00	0	0
30-Dec-14	0.00	0.00	0	0
31-Dec-14	0.00	0.00	0	0
Estimated Total Influx				59,126

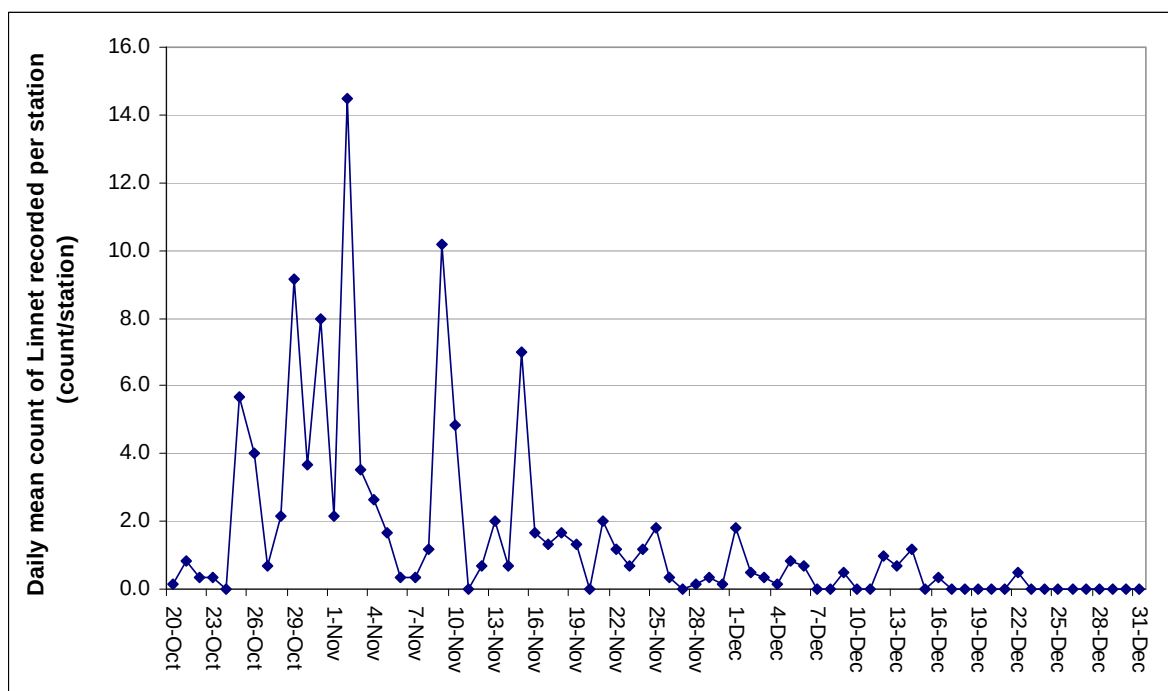
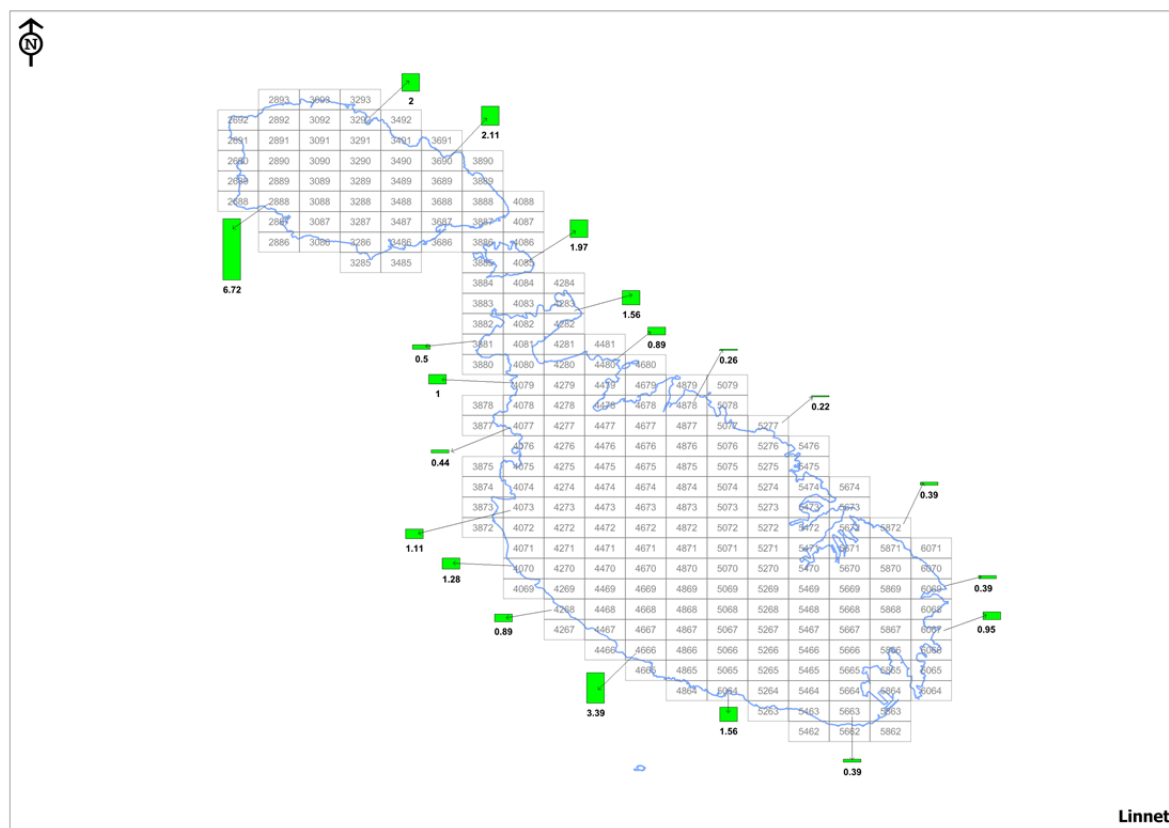


Figure 2. Daily mean counts of Linnet per station (= site) recorded during the present survey made between 20 October and 31 December 2014.



The highest mean count was recorded from Kercem (Grid 2888), while overall high counts were recorded from study sites located along the southwestern parts of Malta and Gozo, the northeastern coast of Gozo and Comino. The lowest mean counts were recorded from the northeastern parts of Malta, particularly from study sites located in the stretch between Salina Bay and Xghajra; the lowest mean count was recorded from Ghallis (Grid 4878).

Chaffinch

Raw daily counts for Chaffinch recorded from the 21 sites during the present study varied between 0 and a maximum of 51 (see Appendix I), while the mean daily counts ranged between 0 and 18.7 (Table 3). Relatively high counts for this species were recorded on some days towards the end of October (25, 26 and 31 October) and on some days during the first half of November (2, 9, 10 and 14 November).. The recorded counts varied appreciably between the different sites: at the lower end, less than 10 individuals were recorded throughout the survey period from each of the sites at grid locations 6069 and 4073, while at the higher end, 105 Chaffinch individuals were recorded from the site at grid location 4666.

Values of mean daily counts and total counts of Chaffinch recorded during the period 20 October to 31 December 2014 from the present survey are summarised in Table 3. Values of standard deviation associated with the mean daily counts are also provided in Table 3. The general trend noted from the count data is a main migratory influx between late October and mid-November (Figure 4).

Table 3

Values of mean ($\pm$ SD) daily count and daily total count recorded from the six study sites, together with total influx of migratory Chaffinch.

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
20-Oct-14	3.00	2.28	18	1627
21-Oct-14	0.67	1.03	4	362
22-Oct-14	0.00	0.00	0	0
23-Oct-14	2.83	5.08	17	1537
24-Oct-14	8.83	14.52	53	4792
25-Oct-14	8.67	16.88	52	4701
26-Oct-14	18.67	21.07	112	10126
27-Oct-14	4.83	3.49	29	2622
28-Oct-14	3.33	2.80	20	1808
29-Oct-14	2.00	3.16	12	1085
30-Oct-14	3.17	2.99	19	1718
31-Oct-14	10.33	8.12	62	5605
1-Nov-14	3.83	3.71	23	2079
2-Nov-14	11.17	14.55	67	6057
3-Nov-14	1.83	1.17	11	994
4-Nov-14	1.17	2.04	7	633
5-Nov-14	1.50	1.64	9	814
6-Nov-14	0.33	0.82	2	181
7-Nov-14	0.33	0.82	2	181
8-Nov-14	1.17	2.86	7	633
9-Nov-14	5.00	4.29	30	2712
10-Nov-14	4.50	5.32	27	2441
11-Nov-14	0.50	0.84	3	271

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
12-Nov-14	0.67	0.82	4	362
13-Nov-14	0.67	1.03	4	362
14-Nov-14	6.00	11.85	36	3255
15-Nov-14	1.33	1.21	8	723
16-Nov-14	2.67	2.73	16	1447
17-Nov-14	2.00	3.03	12	1085
18-Nov-14	1.00	1.67	6	542
19-Nov-14	1.17	1.60	7	633
20-Nov-14	1.83	1.60	11	994
21-Nov-14	0.83	0.98	5	452
22-Nov-14	1.17	1.60	7	633
23-Nov-14	0.83	0.98	5	452
24-Nov-14	0.00	0.00	0	0
25-Nov-14	0.00	0.00	0	0
26-Nov-14	0.83	1.33	5	452
27-Nov-14	0.50	0.84	3	271
28-Nov-14	0.00	0.00	0	0
29-Nov-14	0.17	0.41	1	90
30-Nov-14	0.83	1.60	5	452
1-Dec-14	0.50	1.22	3	271
2-Dec-14	0.00	0.00	0	0
3-Dec-14	0.17	0.41	1	90
4-Dec-14	1.00	0.89	6	542
5-Dec-14	0.33	0.82	2	181
6-Dec-14	0.33	0.82	2	181
7-Dec-14	0.17	0.41	1	90
8-Dec-14	0.00	0.00	0	0
9-Dec-14	0.33	0.82	2	181
10-Dec-14	0.00	0.00	0	0
11-Dec-14	0.50	0.84	3	271
12-Dec-14	0.17	0.41	1	90
13-Dec-14	0.17	0.41	1	90
14-Dec-14	0.00	0.00	0	0
15-Dec-14	0.50	1.22	3	271
16-Dec-14	0.00	0.00	0	0
17-Dec-14	0.67	1.63	4	362
18-Dec-14	0.00	0.00	0	0
19-Dec-14	0.50	0.84	3	271
20-Dec-14	0.00	0.00	0	0
21-Dec-14	0.00	0.00	0	0
22-Dec-14	0.67	1.63	4	362
23-Dec-14	0.00	0.00	0	0
24-Dec-14	0.00	0.00	0	0
25-Dec-14	0.00	0.00	0	0
26-Dec-14	0.00	0.00	0	0
27-Dec-14	0.17	0.41	1	90
28-Dec-14	0.00	0.00	0	0
29-Dec-14	0.00	0.00	0	0
30-Dec-14	0.00	0.00	0	0
31-Dec-14	0.33	0.82	2	181
Estimated Total Influx				68,709

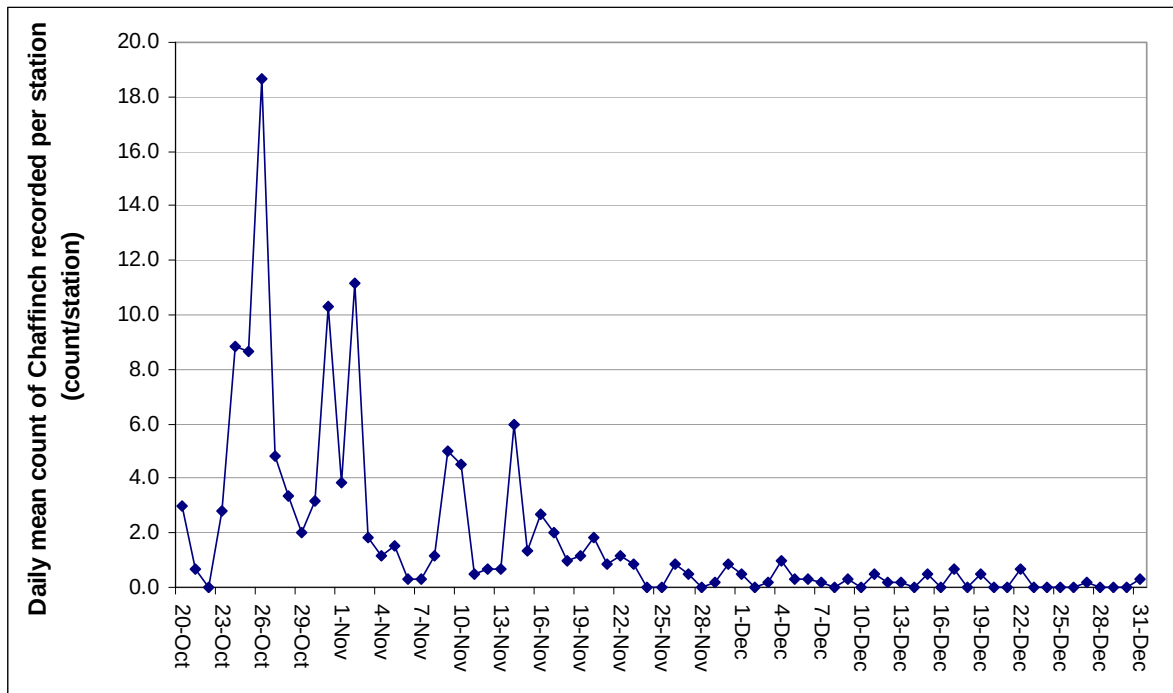


Figure 4. Daily mean counts of Chaffinch per station (= site) recorded during the present survey made between 20 October and 31 December 2014.

An estimate of total influx of Chaffinch over the Maltese Islands is given in Table 3. Based on the mean daily counts (Table 3), extrapolation translates to an estimated daily influx ranging between 0 and 10,126 individuals, with a total influx over the survey period (20 October – 31 December; i.e. 73 days) of 68,709 individuals, i.e. some 941 birds per day; see Table 3.

Mean count values recorded from each of the 21 sites are indicated on the map shown in Figure 5.

The highest mean count was recorded from Fawwara (Grid 4666), while overall high counts were recorded from study sites located in the northern parts of Malta and in Gozo and Comino. The lowest mean counts were recorded from the southern parts of Malta; the lowest value was recorded from Zonqor Point (Grid 6069).

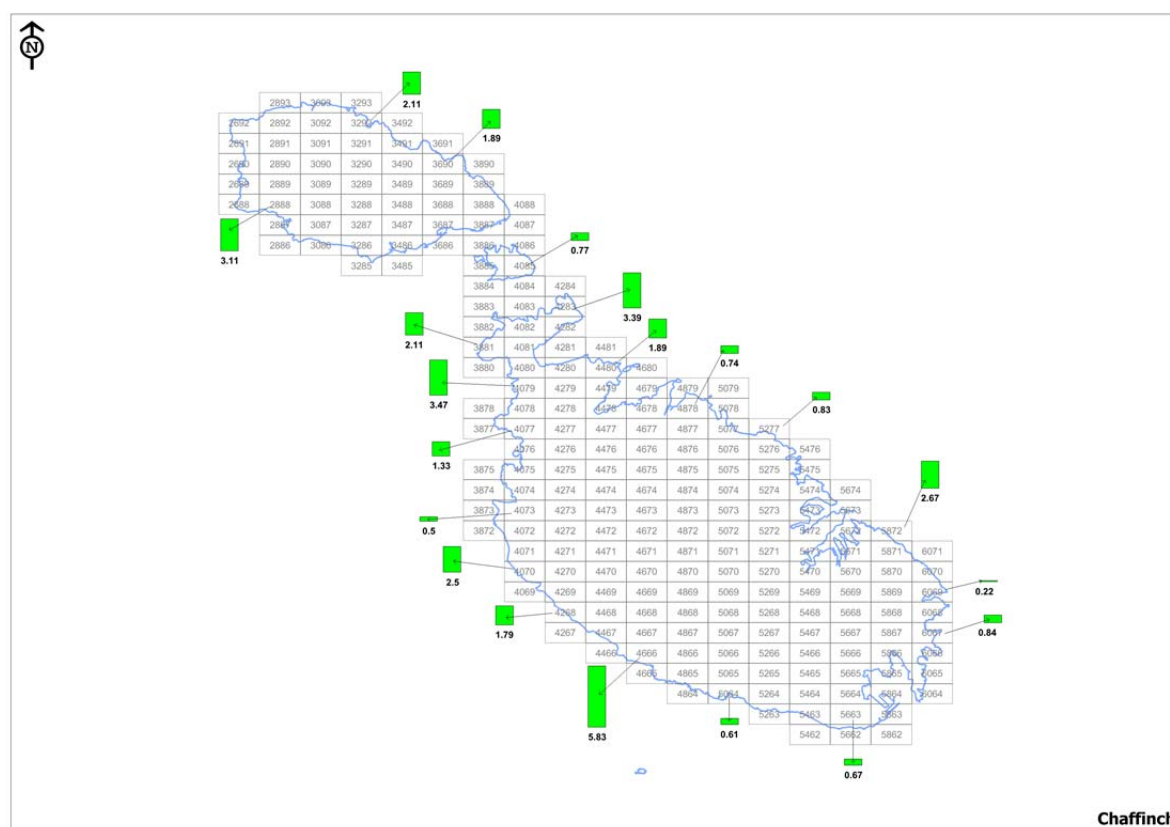


Figure 5. Map of the Maltese Islands showing the standard grid and respective codes, including ones used in the present study. The green bars indicate mean counts of Chaffinch recorded from study sites in the respective cells.

Greenfinch

Raw daily counts for Greenfinch recorded from the 21 sites during the present study varied between 0 and a maximum of 14 (see Appendix I), while the mean daily counts ranged between 0 and 3.0 (Table 4). Relatively high counts for this species were recorded on two days towards the end of October (29 and 31 October) and on three days during the first half of November (9, 10 and 16 November; however these counts were lower than for Linnet and Chaffinch, and never exceeded a total count of 18 on any one day. The recorded counts varied appreciably between the different sites: at the lower end, no individuals were recorded throughout the survey period from each of the sites at grid locations 5064 and 5872 (see Figure 1), while at the higher end, 20 Greenfinch individuals were recorded from the site at grid location 4666.

Values of mean daily counts and total counts of Greenfinch recorded during the period 20 October to 31 December 2014 from the present survey are summarised in Table 4. Values of standard deviation associated with the mean daily counts are also provided in Table 4. The general trend noted from the count data is a main migratory influx during November and early December (Figure 6).

The estimated total influx of Greenfinch over the Maltese Islands is given in Table 4. Based on the mean daily counts (Table 4), extrapolation translates to an estimated daily influx ranging between 0 and 1,627 individuals, with a total influx over the survey period (20 October – 31 December; i.e. 73 days) of 14,465 individuals, i.e. some 198 birds per day; see Table 4.

Mean count values recorded from each of the 21 sites are indicated on the map shown in Figure 7.

Table 4

Values of mean ($\pm$ SD) daily count and daily total count recorded from the six study sites, together with total influx of migratory Greenfinch.

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
20-Oct-14	0.00	0.00	0	0
21-Oct-14	0.00	0.00	0	0
22-Oct-14	0.00	0.00	0	0
23-Oct-14	0.00	0.00	0	0
24-Oct-14	0.00	0.00	0	0
25-Oct-14	0.00	0.00	0	0
26-Oct-14	0.17	0.41	1	90
27-Oct-14	0.00	0.00	0	0
28-Oct-14	0.33	0.82	2	181
29-Oct-14	2.33	5.72	14	1266
30-Oct-14	0.50	1.22	3	271
31-Oct-14	2.17	5.31	13	1175
1-Nov-14	1.00	2.45	6	542
2-Nov-14	0.83	2.04	5	452
3-Nov-14	0.00	0.00	0	0
4-Nov-14	0.00	0.00	0	0
5-Nov-14	0.00	0.00	0	0
6-Nov-14	0.00	0.00	0	0
7-Nov-14	0.00	0.00	0	0
8-Nov-14	0.00	0.00	0	0
9-Nov-14	2.33	2.25	14	1266
10-Nov-14	1.83	3.13	11	994
11-Nov-14	0.00	0.00	0	0
12-Nov-14	0.50	1.22	3	271
13-Nov-14	0.50	1.22	3	271
14-Nov-14	1.00	1.26	6	542
15-Nov-14	1.17	2.04	7	633
16-Nov-14	3.00	3.90	18	1627
17-Nov-14	0.00	0.00	0	0
18-Nov-14	0.00	0.00	0	0
19-Nov-14	1.17	1.47	7	633
20-Nov-14	0.17	0.41	1	90
21-Nov-14	0.00	0.00	0	0
22-Nov-14	0.50	1.22	3	271
23-Nov-14	0.83	0.98	5	452
24-Nov-14	0.17	0.41	1	90
25-Nov-14	0.00	0.00	0	0
26-Nov-14	0.00	0.00	0	0
27-Nov-14	0.67	1.63	4	362
28-Nov-14	0.00	0.00	0	0
29-Nov-14	0.50	1.22	3	271
30-Nov-14	0.00	0.00	0	0
1-Dec-14	0.00	0.00	0	0
2-Dec-14	0.00	0.00	0	0
3-Dec-14	0.33	0.82	2	181
4-Dec-14	0.83	1.33	5	452
5-Dec-14	0.33	0.82	2	181
6-Dec-14	0.33	0.82	2	181

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
7-Dec-14	0.33	0.82	2	181
8-Dec-14	0.33	0.82	2	181
9-Dec-14	0.00	0.00	0	0
10-Dec-14	0.17	0.41	1	90
11-Dec-14	0.00	0.00	0	0
12-Dec-14	0.50	0.84	3	271
13-Dec-14	0.67	1.03	4	362
14-Dec-14	0.00	0.00	0	0
15-Dec-14	0.00	0.00	0	0
16-Dec-14	0.00	0.00	0	0
17-Dec-14	0.00	0.00	0	0
18-Dec-14	0.33	0.52	2	181
19-Dec-14	0.00	0.00	0	0
20-Dec-14	0.33	0.52	2	181
21-Dec-14	0.17	0.41	1	90
22-Dec-14	0.00	0.00	0	0
23-Dec-14	0.33	0.82	2	181
24-Dec-14	0.00	0.00	0	0
25-Dec-14	0.00	0.00	0	0
26-Dec-14	0.00	0.00	0	0
27-Dec-14	0.00	0.00	0	0
28-Dec-14	0.00	0.00	0	0
29-Dec-14	0.00	0.00	0	0
30-Dec-14	0.00	0.00	0	0
31-Dec-14	0.00	0.00	0	0
Estimated Total Influx				14,465

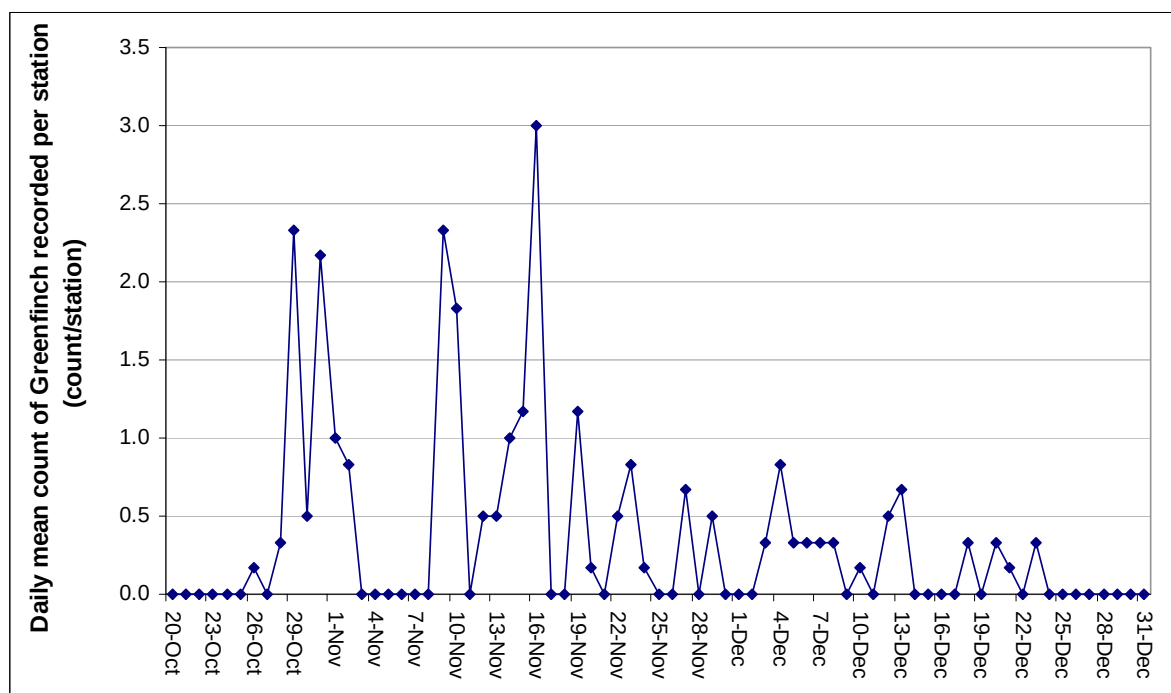


Figure 6. Daily mean counts of Greenfinch per station (= site) recorded during the present survey made between 20 October and 31 December 2014.

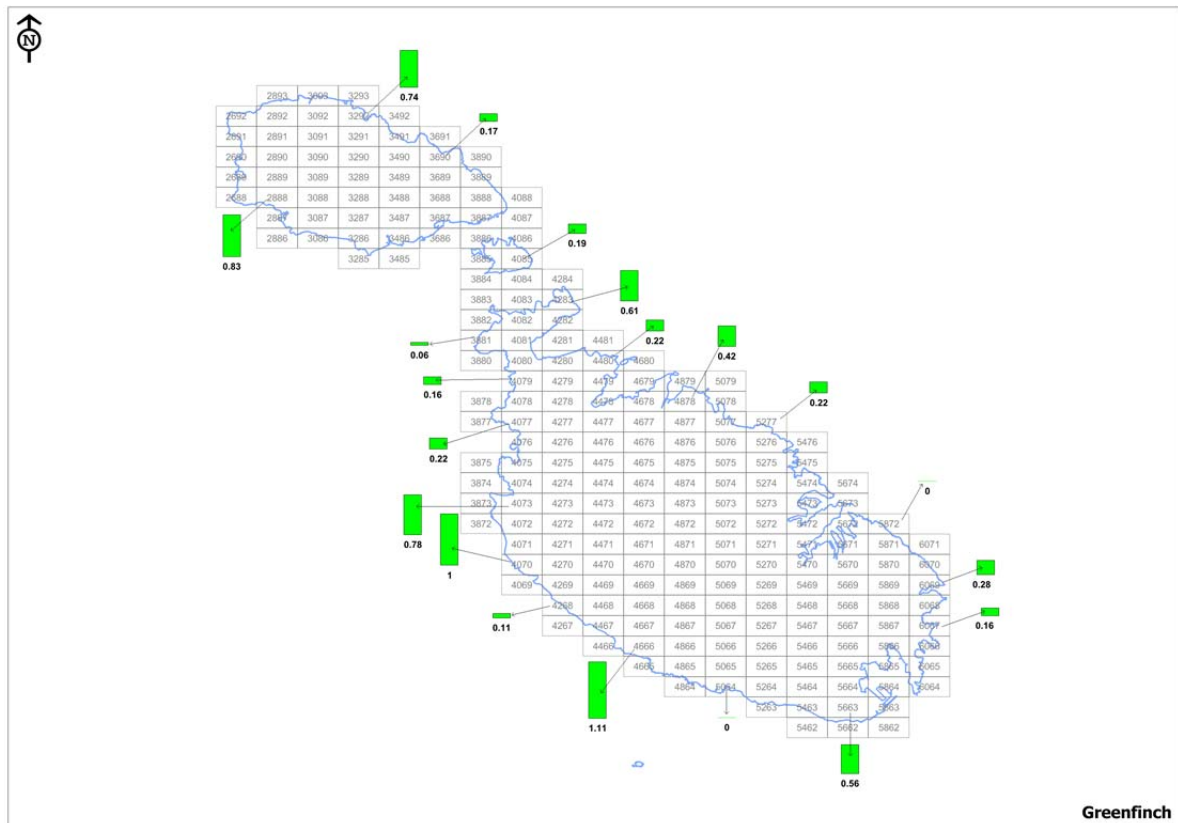


Figure 7. Map of the Maltese Islands showing the standard grid and respective codes, including ones used in the present study. The green bars indicate mean counts of Greenfinch recorded from study sites in the respective cells.

The highest mean count was recorded from Fawwara (Grid 4666), while overall high counts were recorded from study sites located along the southwestern parts of Malta. No individuals of Greenfinch were recorded from Rinella (Grid 5872) and Lapsi (Grid 5064).

Siskin

Raw daily counts for Siskin recorded from the 21 sites during the present study varied between 0 and a maximum of 22 (see Appendix I), while the mean daily counts ranged between 0 and 4.7 (Table 5). The only relatively high count for this species was recorded on 2 November 2014, when a total of 28 Siskin individuals were observed, which is appreciably higher than that recorded on any of the other days during the survey. The recorded counts varied appreciably between the different sites: at the lower end, no individuals were recorded throughout the survey period from 10 of the sites, while at the higher end, 23 Siskin individuals were recorded from the site at grid location 2888 (see Figure 1).

Values of mean daily counts and total counts of Siskin recorded during the period 20 October to 31 December 2014 from the present survey are summarised in Table 5. Values of standard deviation associated with the mean daily counts are also provided in Table 5. No evident temporal trend in migratory influx over the survey period is discernable given that no Siskin individuals were recorded on most days (Figure 8).

Table 5

Values of mean ($\pm$ SD) daily count and daily total count recorded from the six study sites, together with total influx of migratory Siskin.

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
20-Oct-14	0.00	0.00	0	0
21-Oct-14	0.00	0.00	0	0
22-Oct-14	0.17	0.41	1	90
23-Oct-14	0.00	0.00	0	0
24-Oct-14	0.17	0.41	1	90
25-Oct-14	0.00	0.00	0	0
26-Oct-14	0.00	0.00	0	0
27-Oct-14	0.00	0.00	0	0
28-Oct-14	0.00	0.00	0	0
29-Oct-14	0.00	0.00	0	0
30-Oct-14	0.17	0.41	1	90
31-Oct-14	0.67	1.03	4	362
1-Nov-14	1.17	2.04	7	633
2-Nov-14	4.67	8.82	28	2531
3-Nov-14	0.17	0.41	1	90
4-Nov-14	0.00	0.00	0	0
5-Nov-14	0.00	0.00	0	0
6-Nov-14	0.00	0.00	0	0
7-Nov-14	0.00	0.00	0	0
8-Nov-14	0.00	0.00	0	0
9-Nov-14	0.33	0.82	2	181
10-Nov-14	0.17	0.41	1	90
11-Nov-14	0.00	0.00	0	0
12-Nov-14	0.00	0.00	0	0
13-Nov-14	0.00	0.00	0	0
14-Nov-14	0.00	0.00	0	0
15-Nov-14	0.00	0.00	0	0
16-Nov-14	0.00	0.00	0	0
17-Nov-14	0.00	0.00	0	0
18-Nov-14	0.00	0.00	0	0
19-Nov-14	0.00	0.00	0	0
20-Nov-14	0.00	0.00	0	0
21-Nov-14	0.17	0.41	1	90
22-Nov-14	0.00	0.00	0	0
23-Nov-14	0.00	0.00	0	0
24-Nov-14	0.00	0.00	0	0
25-Nov-14	0.00	0.00	0	0
26-Nov-14	0.00	0.00	0	0
27-Nov-14	0.00	0.00	0	0
28-Nov-14	0.00	0.00	0	0
29-Nov-14	0.00	0.00	0	0
30-Nov-14	0.00	0.00	0	0
1-Dec-14	0.17	0.41	1	90
2-Dec-14	0.00	0.00	0	0
3-Dec-14	0.00	0.00	0	0
4-Dec-14	0.00	0.00	0	0
5-Dec-14	0.00	0.00	0	0
6-Dec-14	0.17	0.41	1	90

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
7-Dec-14	0.00	0.00	0	0
8-Dec-14	0.00	0.00	0	0
9-Dec-14	0.00	0.00	0	0
10-Dec-14	0.00	0.00	0	0
11-Dec-14	0.00	0.00	0	0
12-Dec-14	0.00	0.00	0	0
13-Dec-14	0.00	0.00	0	0
14-Dec-14	0.00	0.00	0	0
15-Dec-14	0.00	0.00	0	0
16-Dec-14	0.00	0.00	0	0
17-Dec-14	0.00	0.00	0	0
18-Dec-14	0.00	0.00	0	0
19-Dec-14	0.00	0.00	0	0
20-Dec-14	0.00	0.00	0	0
21-Dec-14	0.00	0.00	0	0
22-Dec-14	0.00	0.00	0	0
23-Dec-14	0.00	0.00	0	0
24-Dec-14	0.00	0.00	0	0
25-Dec-14	0.00	0.00	0	0
26-Dec-14	0.00	0.00	0	0
27-Dec-14	0.00	0.00	0	0
28-Dec-14	0.00	0.00	0	0
29-Dec-14	0.00	0.00	0	0
30-Dec-14	0.00	0.00	0	0
31-Dec-14	0.00	0.00	0	0
Estimated Total Influx				4,430

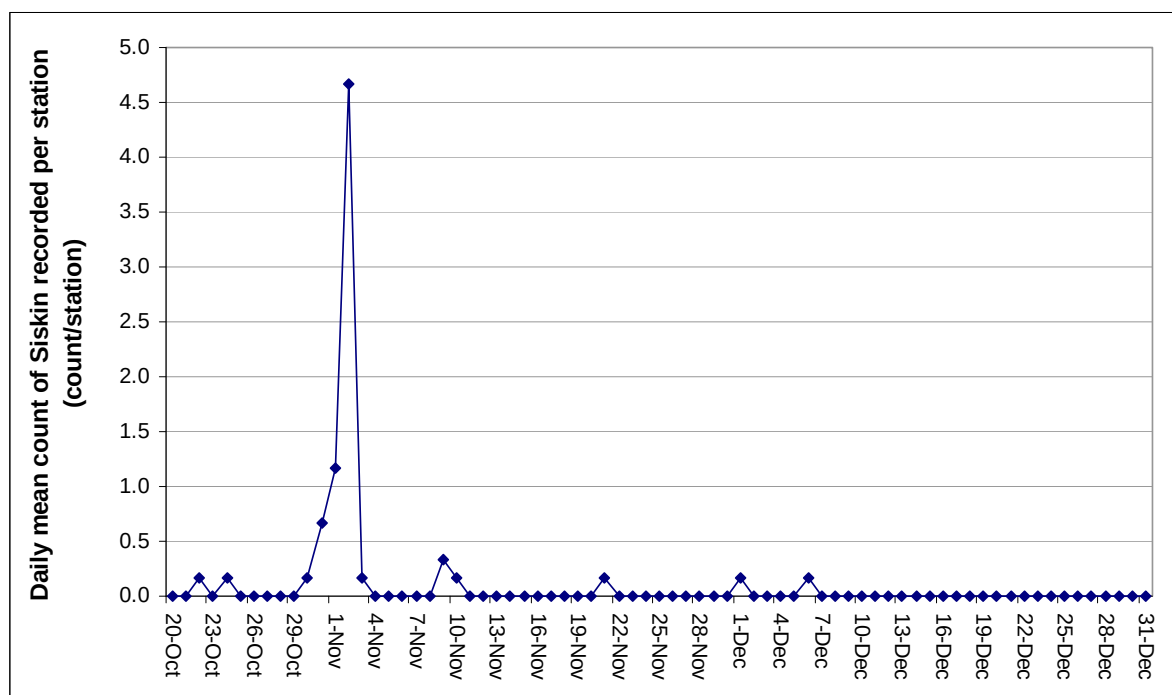


Figure 8. Daily mean counts of Siskin per station (= site) recorded during the present survey made between 20 October and 31 December 2014.

The estimated total influx of Siskin over the Maltese Islands is given in Table 5. Based on the mean daily counts (Table 5), extrapolation translates to an estimated daily influx ranging between 0 and 2,531 individuals, with a total influx over the survey period (20 October – 31 December; i.e. 73 days) of 4,430 individuals, i.e. some 61 birds per day; see Table 5.

Mean count values recorded from each of the 21 sites are indicated on the map shown in Figure 9.

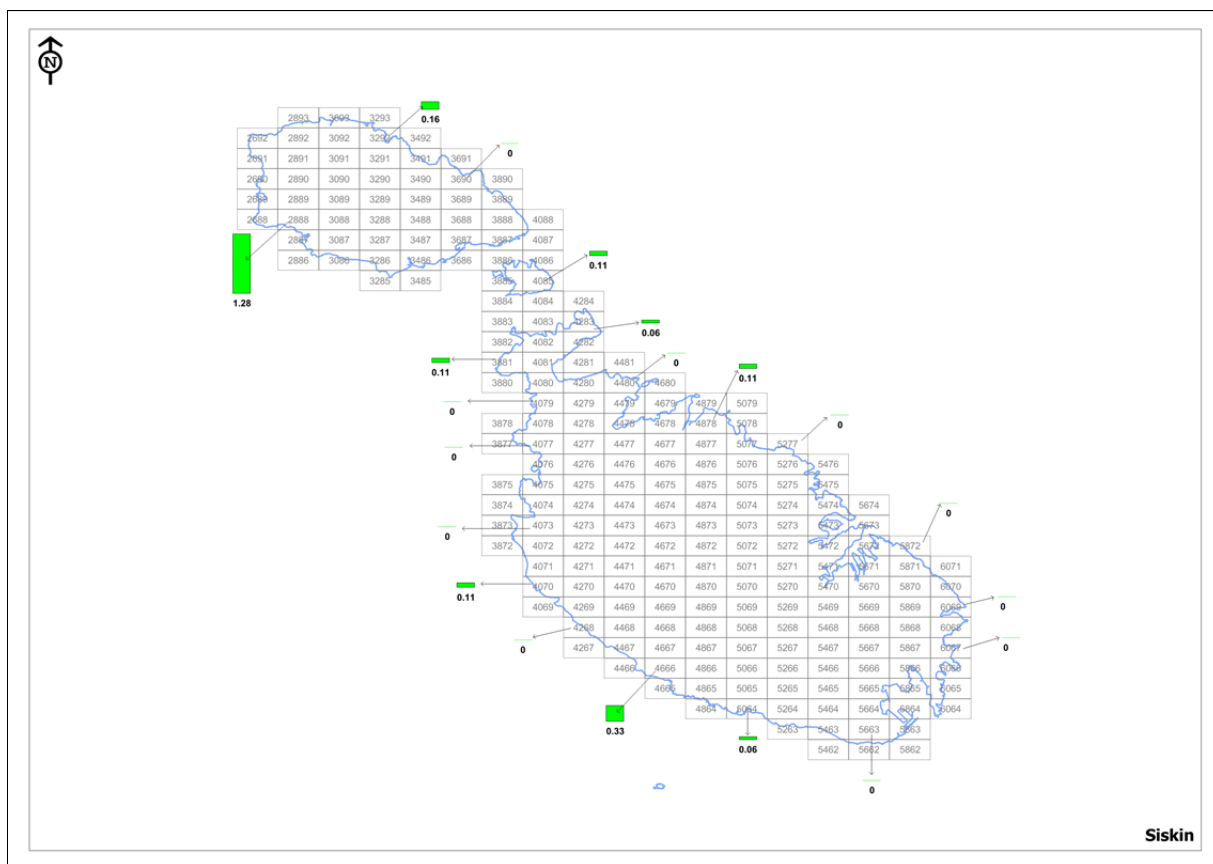


Figure 9. Map of the Maltese Islands showing the standard grid and respective codes, including ones used in the present study. The green bars indicate mean counts of Siskin recorded from study sites in the respective cells.

The highest mean count was recorded from Kercem (Grid 2888), while no counts of Siskin were recorded from most of the study sites located in the southeastern parts of Malta.

Goldfinch

Raw daily counts for Goldfinch recorded from the 21 sites during the present study varied between 0 and a maximum of 3 (see Appendix I), while the mean daily counts ranged between 0 and 0.5 (Table 6). Counts for this species were therefore very low overall: between 1 and 3 Goldfinch individuals were recorded from the sites at grid locations 2888 and 5064 (see Figure 1), while no individuals were recorded throughout the survey period from any of the other sites.

Values of mean daily counts and total counts of Goldfinch recorded during the period 20 October to 31 December 2014 from the present survey are summarised in Table 6. Values of standard deviation

associated with the mean daily counts are also provided in Table 6. No temporal trend in migratory influx over the survey period is discernable given that no Goldfinch individuals were recorded on most days (Figure 10).

Table 6

Values of mean ($\pm$ SD) daily count and daily total count recorded from the six study sites, together with total influx of migratory Goldfinch.

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
20-Oct-14	0.00	0.00	0	0
21-Oct-14	0.00	0.00	0	0
22-Oct-14	0.00	0.00	0	0
23-Oct-14	0.00	0.00	0	0
24-Oct-14	0.00	0.00	0	0
25-Oct-14	0.00	0.00	0	0
26-Oct-14	0.00	0.00	0	0
27-Oct-14	0.00	0.00	0	0
28-Oct-14	0.00	0.00	0	0
29-Oct-14	0.00	0.00	0	0
30-Oct-14	0.00	0.00	0	0
31-Oct-14	0.00	0.00	0	0
1-Nov-14	0.00	0.00	0	0
2-Nov-14	0.17	0.41	1	90
3-Nov-14	0.00	0.00	0	0
4-Nov-14	0.00	0.00	0	0
5-Nov-14	0.00	0.00	0	0
6-Nov-14	0.00	0.00	0	0
7-Nov-14	0.00	0.00	0	0
8-Nov-14	0.00	0.00	0	0
9-Nov-14	0.00	0.00	0	0
10-Nov-14	0.00	0.00	0	0
11-Nov-14	0.00	0.00	0	0
12-Nov-14	0.00	0.00	0	0
13-Nov-14	0.00	0.00	0	0
14-Nov-14	0.00	0.00	0	0
15-Nov-14	0.00	0.00	0	0
16-Nov-14	0.00	0.00	0	0
17-Nov-14	0.00	0.00	0	0
18-Nov-14	0.00	0.00	0	0
19-Nov-14	0.00	0.00	0	0
20-Nov-14	0.00	0.00	0	0
21-Nov-14	0.00	0.00	0	0
22-Nov-14	0.00	0.00	0	0
23-Nov-14	0.00	0.00	0	0
24-Nov-14	0.00	0.00	0	0
25-Nov-14	0.00	0.00	0	0
26-Nov-14	0.00	0.00	0	0
27-Nov-14	0.00	0.00	0	0
28-Nov-14	0.00	0.00	0	0
29-Nov-14	0.00	0.00	0	0

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
30-Nov-14	0.00	0.00	0	0
1-Dec-14	0.50	1.22	3	271
2-Dec-14	0.00	0.00	0	0
3-Dec-14	0.00	0.00	0	0
4-Dec-14	0.00	0.00	0	0
5-Dec-14	0.00	0.00	0	0
6-Dec-14	0.00	0.00	0	0
7-Dec-14	0.00	0.00	0	0
8-Dec-14	0.00	0.00	0	0
9-Dec-14	0.00	0.00	0	0
10-Dec-14	0.00	0.00	0	0
11-Dec-14	0.00	0.00	0	0
12-Dec-14	0.00	0.00	0	0
13-Dec-14	0.00	0.00	0	0
14-Dec-14	0.00	0.00	0	0
15-Dec-14	0.00	0.00	0	0
16-Dec-14	0.00	0.00	0	0
17-Dec-14	0.00	0.00	0	0
18-Dec-14	0.00	0.00	0	0
19-Dec-14	0.00	0.00	0	0
20-Dec-14	0.00	0.00	0	0
21-Dec-14	0.00	0.00	0	0
22-Dec-14	0.00	0.00	0	0
23-Dec-14	0.00	0.00	0	0
24-Dec-14	0.00	0.00	0	0
25-Dec-14	0.00	0.00	0	0
26-Dec-14	0.00	0.00	0	0
27-Dec-14	0.00	0.00	0	0
28-Dec-14	0.00	0.00	0	0
29-Dec-14	0.00	0.00	0	0
30-Dec-14	0.00	0.00	0	0
31-Dec-14	0.00	0.00	0	0
Estimated Total Influx				362

The estimated total influx of Goldfinch over the Maltese Islands is given in Table 6. Based on the mean daily counts (Table 6), extrapolation translates to an estimated daily influx ranging between 0 and 271 individuals, with a total influx over the survey period (20 October – 31 December; i.e. 73 days) of 362 individuals; see Table 6.

Mean count values recorded from each of the 21 sites are indicated on the map shown in Figure 11. Only two counts of Goldfinch were recorded; these were made from Kercem (Grid 2888; where one individual was recorded) and Lapsi (Grid 5064; where three individuals were recorded).

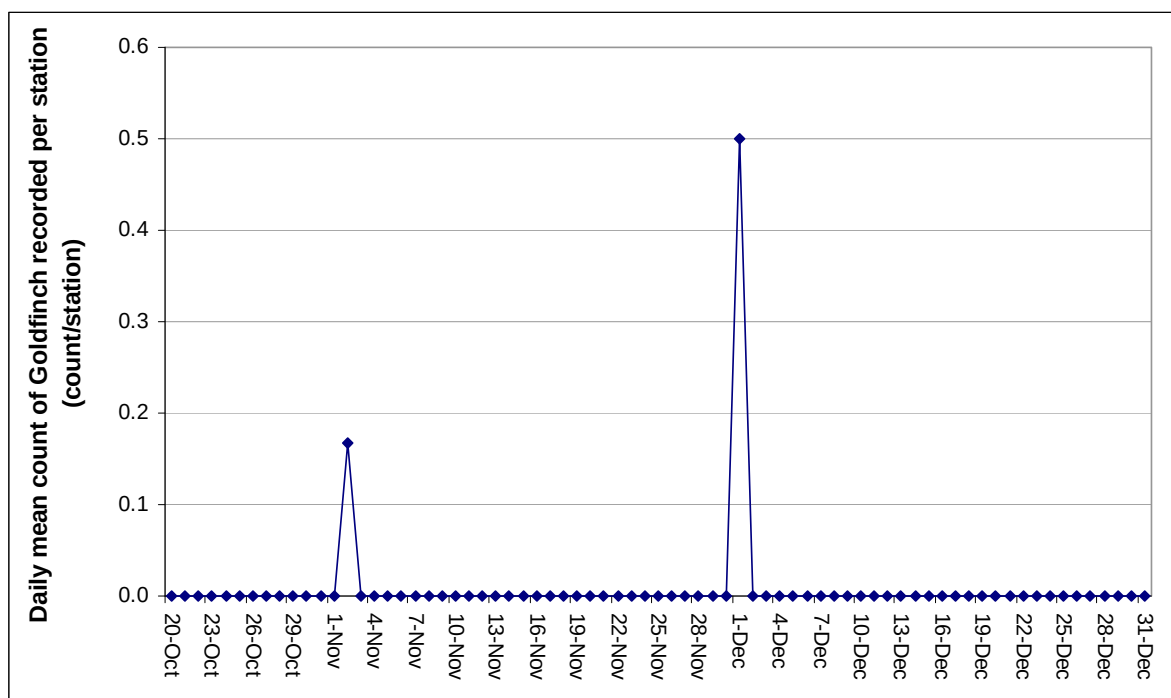


Figure 10. Daily mean counts of Goldfinch per station (= site) recorded during the present survey made between 20 October and 31 December 2014.

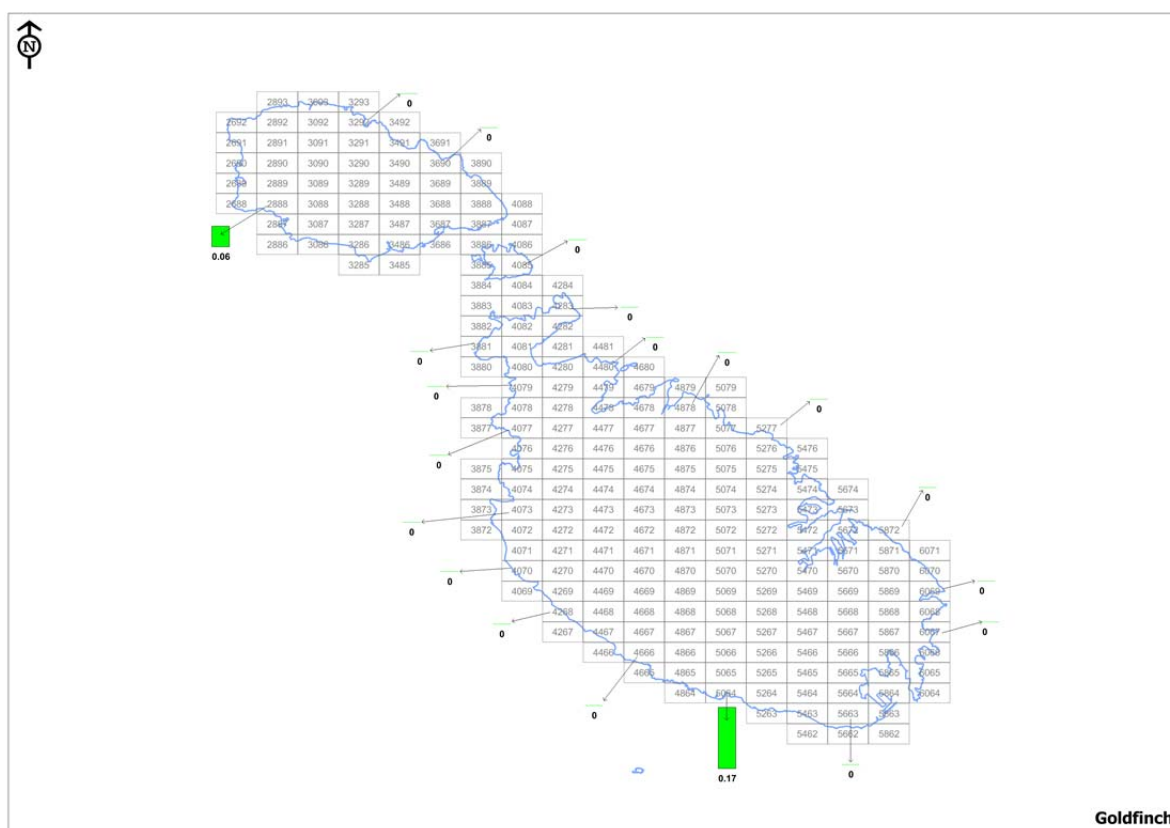


Figure 11. Map of the Maltese Islands showing the standard grid and respective codes, including ones used in the present study. The green bars indicate mean counts of Goldfinch recorded from study sites in the respective cells.

Serin

Raw daily counts for Serin recorded from the 21 sites during the present study varied between 0 and a maximum of 31 (see Appendix I), while the mean daily counts ranged between 0 and 5.7 (Table 7). Relatively high counts for this species were recorded on 9 and 16 November 2014. The recorded counts varied appreciably between the different sites: at the lower end, no individuals were recorded throughout the survey period from each of the sites at grid locations 4878, 6069 and 4480 (see Figure 1), while at the higher end, 32 Serin individuals were recorded from the site at grid location 3292.

Values of mean daily counts and total counts of Serin recorded during the period 20 October to 31 December 2014 from the present survey are summarised in Table 7. Values of standard deviation associated with the mean daily counts are also provided in Table 7. The general trend noted from the count data is a main migratory influx during November (Figure 12).

Table 7

Values of mean ($\pm$ SD) daily count and daily total count recorded from the six study sites, together with total influx of migratory Serin.

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
20-Oct-14	0.00	0.00	0	0
21-Oct-14	0.00	0.00	0	0
22-Oct-14	0.33	0.82	2	181
23-Oct-14	0.00	0.00	0	0
24-Oct-14	0.00	0.00	0	0
25-Oct-14	0.00	0.00	0	0
26-Oct-14	0.00	0.00	0	0
27-Oct-14	0.00	0.00	0	0
28-Oct-14	0.00	0.00	0	0
29-Oct-14	0.00	0.00	0	0
30-Oct-14	0.17	0.41	1	90
31-Oct-14	2.00	4.00	12	1085
1-Nov-14	0.00	0.00	0	0
2-Nov-14	1.67	2.66	10	904
3-Nov-14	0.33	0.82	2	181
4-Nov-14	1.00	1.67	6	542
5-Nov-14	0.00	0.00	0	0
6-Nov-14	0.00	0.00	0	0
7-Nov-14	0.00	0.00	0	0
8-Nov-14	0.00	0.00	0	0
9-Nov-14	5.67	12.47	34	3074
10-Nov-14	1.00	2.45	6	542
11-Nov-14	0.00	0.00	0	0
12-Nov-14	1.00	1.67	6	542
13-Nov-14	0.00	0.00	0	0
14-Nov-14	0.00	0.00	0	0
15-Nov-14	0.00	0.00	0	0
16-Nov-14	3.00	4.82	18	1627
17-Nov-14	0.00	0.00	0	0
18-Nov-14	0.00	0.00	0	0
19-Nov-14	1.67	2.25	10	904
20-Nov-14	0.00	0.00	0	0

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
21-Nov-14	1.50	1.97	9	814
22-Nov-14	0.50	1.22	3	271
23-Nov-14	0.00	0.00	0	0
24-Nov-14	0.00	0.00	0	0
25-Nov-14	0.17	0.41	1	90
26-Nov-14	0.00	0.00	0	0
27-Nov-14	0.00	0.00	0	0
28-Nov-14	0.67	1.63	4	362
29-Nov-14	0.00	0.00	0	0
30-Nov-14	1.17	1.47	7	633
1-Dec-14	0.00	0.00	0	0
2-Dec-14	0.00	0.00	0	0
3-Dec-14	0.00	0.00	0	0
4-Dec-14	0.83	1.33	5	452
5-Dec-14	0.00	0.00	0	0
6-Dec-14	0.00	0.00	0	0
7-Dec-14	0.00	0.00	0	0
8-Dec-14	0.00	0.00	0	0
9-Dec-14	0.17	0.41	1	90
10-Dec-14	0.00	0.00	0	0
11-Dec-14	0.00	0.00	0	0
12-Dec-14	0.00	0.00	0	0
13-Dec-14	0.33	0.82	2	181
14-Dec-14	0.17	0.41	1	90
15-Dec-14	0.00	0.00	0	0
16-Dec-14	0.50	1.22	3	271
17-Dec-14	0.00	0.00	0	0
18-Dec-14	0.33	0.82	2	181
19-Dec-14	0.00	0.00	0	0
20-Dec-14	0.33	0.82	2	181
21-Dec-14	0.17	0.41	1	90
22-Dec-14	0.33	0.82	2	181
23-Dec-14	0.00	0.00	0	0
24-Dec-14	0.33	0.82	2	181
25-Dec-14	0.17	0.41	1	90
26-Dec-14	0.00	0.00	0	0
27-Dec-14	0.17	0.41	1	90
28-Dec-14	0.00	0.00	0	0
29-Dec-14	0.00	0.00	0	0
30-Dec-14	0.00	0.00	0	0
31-Dec-14	0.00	0.00	0	0
Estimated Total Influx				13,923

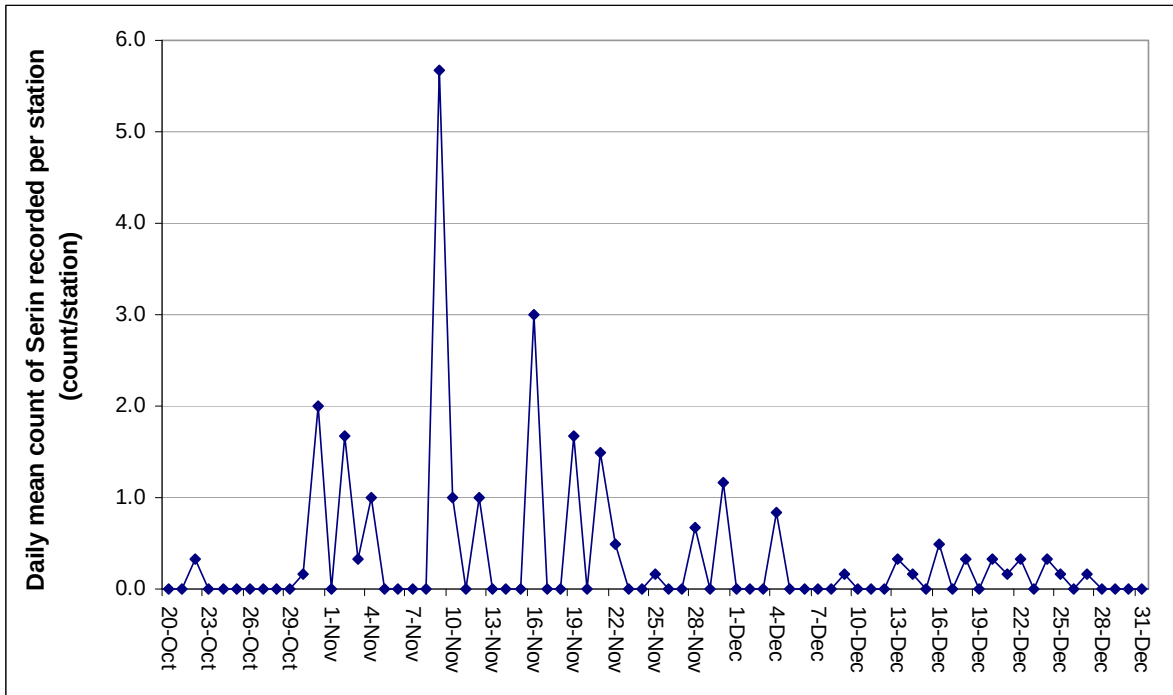


Figure 12. Daily mean counts of Serin per station (= site) recorded during the present survey made between 20 October and 31 December 2014.

The estimated total influx of Serin over the Maltese Islands is given in Table 7. Based on the mean daily counts (Table 7), extrapolation translates to an estimated daily influx ranging between 0 and 3,074 individuals, with a total influx over the survey period (20 October – 31 December; i.e. 73 days) of 13,923 individuals, i.e. some 191 birds per day; see Table 7.

Mean count values recorded from each of the 21 sites are indicated on the map shown in Figure 13.

The highest mean count was recorded from Marsalforn (Grid 3292), while overall high counts were recorded from the other two study sites located in Gozo. Relatively low counts were recorded from the southern half of Malta; no individuals of Serin were recorded from Mgiebah (Grid 4480), Ghallis (Grid 4878), and Zonqor Point (Grid 6069).

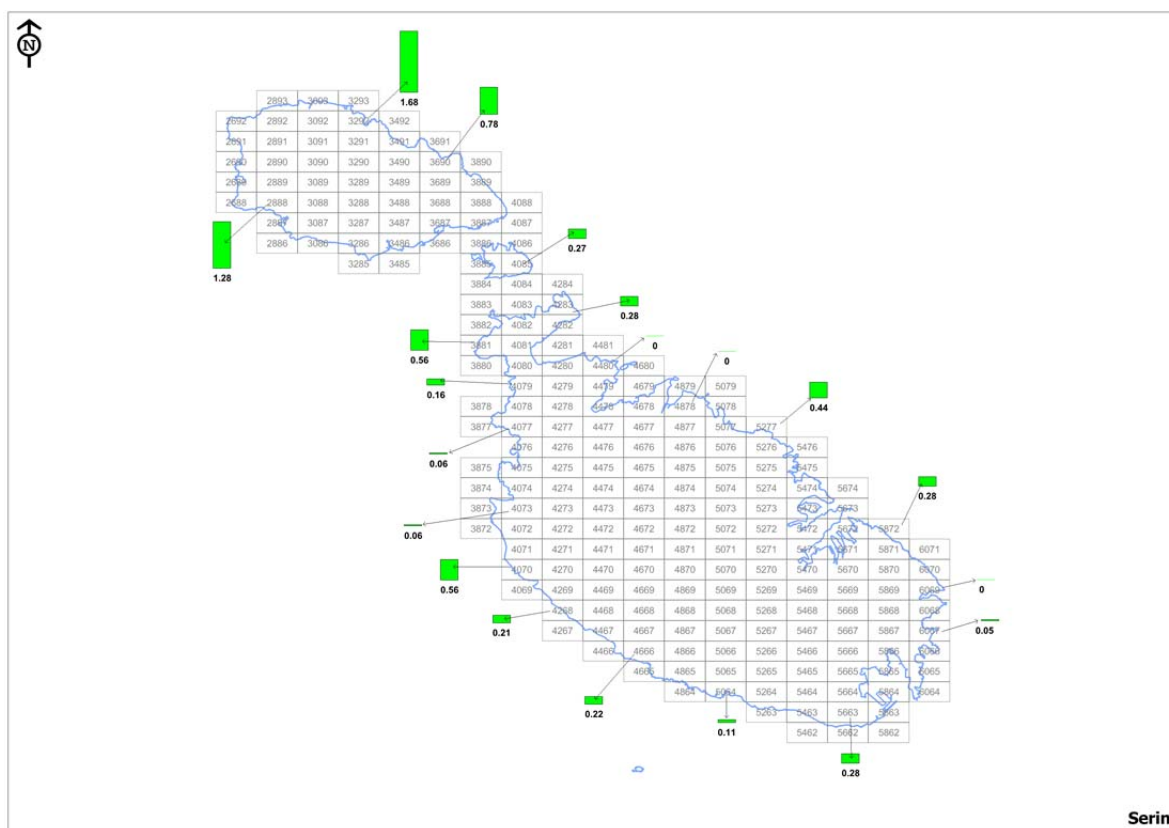


Figure 13. Map of the Maltese Islands showing the standard grid and respective codes, including ones used in the present study. The green bars indicate mean counts of Serin recorded from study sites in the respective cells.

Hawfinch

Raw daily counts for Hawfinch recorded from the 21 sites during the present study varied between 0 and a maximum of 4 (see Appendix I), while the mean daily counts ranged between 0 and 1.5 (Table 8). A relatively high count of this species was recorded on 20 October.. Overall, the recorded counts did not vary appreciably between the different sites: at the higher end, 7 Hawfinch individuals were recorded from the site at grid location 4480 (see Figure 1), while no individuals were recorded throughout the survey period from 9 of the sites.

Values of mean daily counts and total counts of Hawfinch recorded during the period 20 October to 31 December 2014 from the present survey are summarised in Table 8. Values of standard deviation associated with the mean daily counts are also provided in Table 8. The general trend noted from the count data is a main migratory influx during the last 10 days of October (Figure 14), which corresponded to the first 10 days of the study period.

Table 8

Values of mean ($\pm$ SD) daily count and daily total count recorded from the six study sites, together with total influx of migratory Hawfinch.

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
20-Oct-14	1.50	1.52	9	814
21-Oct-14	0.50	1.22	3	271
22-Oct-14	0.67	1.63	4	362
23-Oct-14	0.00	0.00	0	0
24-Oct-14	0.00	0.00	0	0
25-Oct-14	0.00	0.00	0	0
26-Oct-14	0.33	0.82	2	181
27-Oct-14	0.17	0.41	1	90
28-Oct-14	0.17	0.41	1	90
29-Oct-14	0.33	0.82	2	181
30-Oct-14	0.17	0.41	1	90
31-Oct-14	0.00	0.00	0	0
1-Nov-14	0.50	0.55	3	271
2-Nov-14	0.67	1.21	4	362
3-Nov-14	0.00	0.00	0	0
4-Nov-14	0.50	1.22	3	271
5-Nov-14	0.00	0.00	0	0
6-Nov-14	0.00	0.00	0	0
7-Nov-14	0.00	0.00	0	0
8-Nov-14	0.00	0.00	0	0
9-Nov-14	0.17	0.41	1	90
10-Nov-14	0.00	0.00	0	0
11-Nov-14	0.00	0.00	0	0
12-Nov-14	0.00	0.00	0	0
13-Nov-14	0.00	0.00	0	0
14-Nov-14	0.00	0.00	0	0
15-Nov-14	0.00	0.00	0	0
16-Nov-14	0.00	0.00	0	0
17-Nov-14	0.00	0.00	0	0
18-Nov-14	0.17	0.41	1	90
19-Nov-14	0.00	0.00	0	0
20-Nov-14	0.00	0.00	0	0
21-Nov-14	0.00	0.00	0	0
22-Nov-14	0.00	0.00	0	0
23-Nov-14	0.00	0.00	0	0
24-Nov-14	0.00	0.00	0	0
25-Nov-14	0.00	0.00	0	0
26-Nov-14	0.00	0.00	0	0
27-Nov-14	0.00	0.00	0	0
28-Nov-14	0.00	0.00	0	0
29-Nov-14	0.00	0.00	0	0
30-Nov-14	0.00	0.00	0	0
1-Dec-14	0.00	0.00	0	0
2-Dec-14	0.00	0.00	0	0
3-Dec-14	0.00	0.00	0	0
4-Dec-14	0.00	0.00	0	0
5-Dec-14	0.00	0.00	0	0
6-Dec-14	0.00	0.00	0	0

Date	Mean Count $\pm$ SD		Total count	Estimated Daily Influx
7-Dec-14	0.00	0.00	0	0
8-Dec-14	0.00	0.00	0	0
9-Dec-14	0.00	0.00	0	0
10-Dec-14	0.00	0.00	0	0
11-Dec-14	0.00	0.00	0	0
12-Dec-14	0.00	0.00	0	0
13-Dec-14	0.00	0.00	0	0
14-Dec-14	0.00	0.00	0	0
15-Dec-14	0.00	0.00	0	0
16-Dec-14	0.00	0.00	0	0
17-Dec-14	0.00	0.00	0	0
18-Dec-14	0.00	0.00	0	0
19-Dec-14	0.00	0.00	0	0
20-Dec-14	0.00	0.00	0	0
21-Dec-14	0.00	0.00	0	0
22-Dec-14	0.00	0.00	0	0
23-Dec-14	0.00	0.00	0	0
24-Dec-14	0.00	0.00	0	0
25-Dec-14	0.00	0.00	0	0
26-Dec-14	0.00	0.00	0	0
27-Dec-14	0.00	0.00	0	0
28-Dec-14	0.00	0.00	0	0
29-Dec-14	0.00	0.00	0	0
30-Dec-14	0.00	0.00	0	0
31-Dec-14	0.00	0.00	0	0
Estimated Total Influx				3,164

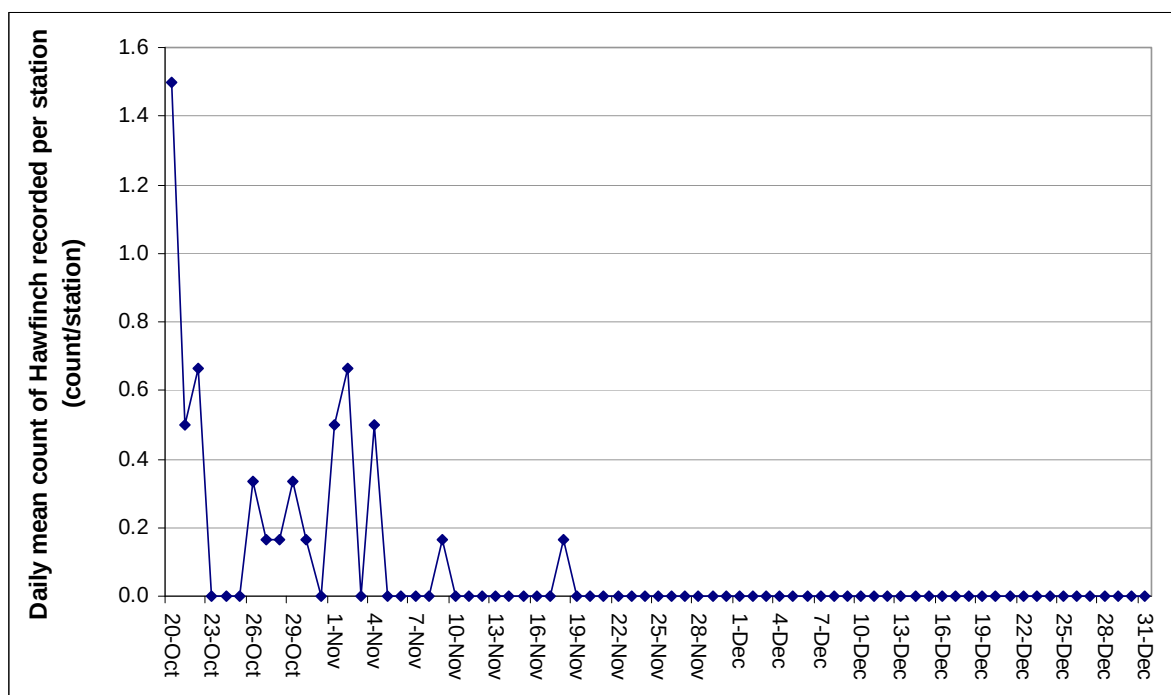


Figure 14. Daily mean counts of Hawfinch per station (= site) recorded during the present survey made between 20 October and 31 December 2014.

The estimated total influx of Hawfinch over the Maltese Islands is given in Table 8. Based on the mean daily counts (Table 2), extrapolation translates to an estimated daily influx ranging between 0 and 814 individuals, with a total influx over the survey period (20 October – 31 December; i.e. 73 days) of 3,164 individuals, i.e. some 43 birds per day; see Table 8.

Mean count values recorded from each of the 21 sites are indicated on the map shown in Figure 15.

The highest mean count was recorded from Mgiebah (Grid 4480), while overall high counts were recorded from study sites located along the southwestern and northeastern parts of Malta. No individuals of Hawfinch were recorded from two of the three sites in Gozo, the site in Comino, and several sites in the western parts of Malta.

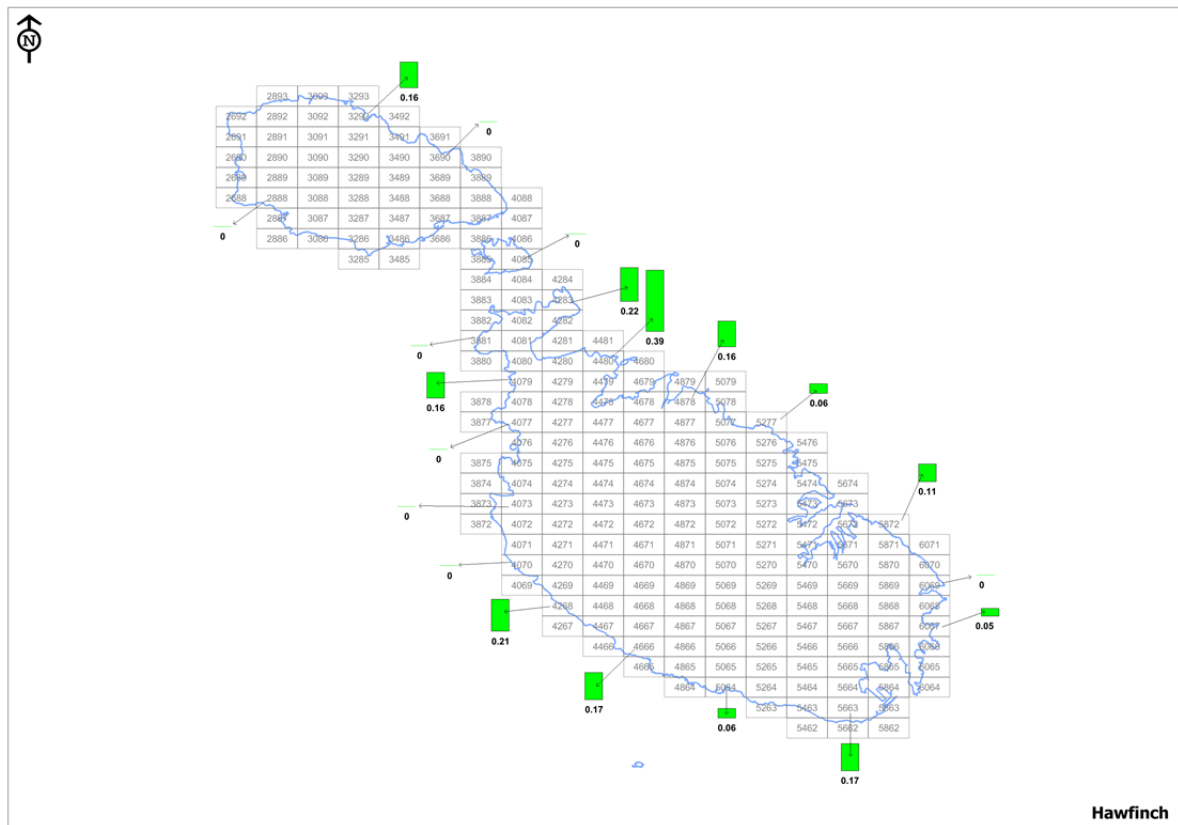


Figure 15. Map of the Maltese Islands showing the standard grid and respective codes, including ones used in the present study. The green bars indicate mean counts of Hawfinch recorded from study sites in the respective cells.

4. Comparison with bag data

A comparative analysis of the results obtained during this study with bag data provided by the Wild Birds Regulation Unit (WBRU) of the MSDEC was undertaken. It should be stated from the outset that the two sets of data were collected for different purposes, using very different methodologies, and therefore the magnitudes of the values are not directly comparable. However, the temporal trends can be expected to follow similar patterns, that is periods when higher mean daily counts were recorded during the present survey should broadly follow the days when higher numbers of finches were captured (and reported in the bag data), assuming the influx of the finch species follows the same temporal trend from year to year. However if the latter assumption is incorrect, the trends would not be expected to correlate. This assumption can only be confirmed through a longitudinal study of influx of different finch species over a period of several years.

Two sets of bag data were provided by the WBRU for this comparison. The first data set was extracted from *Carnet de Chasse* collected in previous years for the same period (20 October to 31 December). The *Carnet de Chasse* data collection changed throughout the years: from 2002 to 2006 data were reported on weekly basis, while data were reported on a decadal basis during 2007 and 2008; no *Carnet de Chasse* data were collected between 2009 and 2013 since a finch live-capturing (trapping) season was not opened during those years. Thus no daily bag counts are available through *Carnet de Chasse* data for the period 2009 – 2013. The second data set comprises the daily bag count of finches (as reported by live-capturers through an SMS reporting scheme) from the period 20 October to 31 December 2014.

Graphical representations of the mean or total daily counts made during the present (2014) survey and the daily bag counts for the same time period (20 October – 31 December 2014; MSDEC unpublished data) of each of the 7 finch species were prepared to compare temporal trends among the two different data sets. In a graphical plot showing daily counts, a high variation in counts from day to day may overshadow temporal trends over the two-month period. To aid visual interpretation, a second set of analyses was undertaken by computing a moving average using a rolling 5-day period for the time series count data of each year. This has the effect of smoothing out the day to day fluctuations and hence making longer-term trends in mean/total daily counts or daily bag counts more apparent, thus facilitating visual interpretation of temporal trends. Note that the analyses based on a moving average do not replace those based on the raw daily counts. Rather, the graphical representations showing a 5-day moving average should be seen in conjunction with those based on daily counts, which are also presented.

Since the available *Carnet de Chasse* data are based on the number of finches caught per week or decade, these could not be compared directly to the daily counts recorded during the present survey. To enable comparison with the 2002 – 2006 *Carnet de Chasse* weekly data, the results of the 2014 survey were used to compute the total counts for every week during the survey period (11 weeks in all). Likewise, the total count for every decade during the survey period (8 decades in all) was computed in order to render the results of the 2014 survey comparable to the 2007 – 2008 *Carnet de Chasse* data. Graphical representations of the weekly (2002 – 2006 & 2014 data) or decadal (2007 – 2008 & 2014 data) counts were then plotted to enable visual comparison of temporal trends.

Linnet

The daily bag counts indicating the number of Linnet caught during the 2014 live-capturing season and the mean daily counts of Linnet made during the present (2014) survey are shown in Figure 16, while Figure 17 presents the 5-day moving average computed from these data. For reference, Figures 18 – 19 show the same data, but with the results from the present (2014) survey are given as total daily counts. For comparison with bag counts made in previous years, Figure 20 shows the weekly bag count for Linnet during 2002 – 2006 and corresponding total count per week for the 2014 survey, while Figure 21 shows the decadal bag count for Linnet during 2007 – 2008 and corresponding total count per decade for the 2014 survey. As already noted, the magnitudes of the bag counts and those of the mean/total counts made in the 2014 survey are not directly comparable. In fact, the two sets of values are on different scales. Therefore, in Figures 16–21, two separate y-axes are used: the bag count data is plotted on the left-side y-axis, whereas the counts from the 2014 survey are plotted on the right-side y-axis.

Overall, the highest daily counts made during the 2014 survey occurred in early November, while the highest bag counts occurred in mid-November. Thus, the general trend observed in the bag counts for 2014 and daily counts recorded during the 2014 survey is of slightly higher counts in the early part of the live-capturing season, up to around 20 November. Both the number of Linnet observed per day during the 2014 survey and the number Linnet caught declined thereafter. Live-capturing reports indicated a slight increase in the number of Linnet caught during the last week of December 2014, whereas the daily counts from the 2014 survey continued to decline until the end of the survey period. When the results from the present survey were compared to the 2002 – 2008 *Carnet de Chasse* data, very similar temporal trends were observed, with higher counts occurring in weeks 2-3 / decade 2, corresponding to early to mid-November, followed by a steady decline until the end of December.

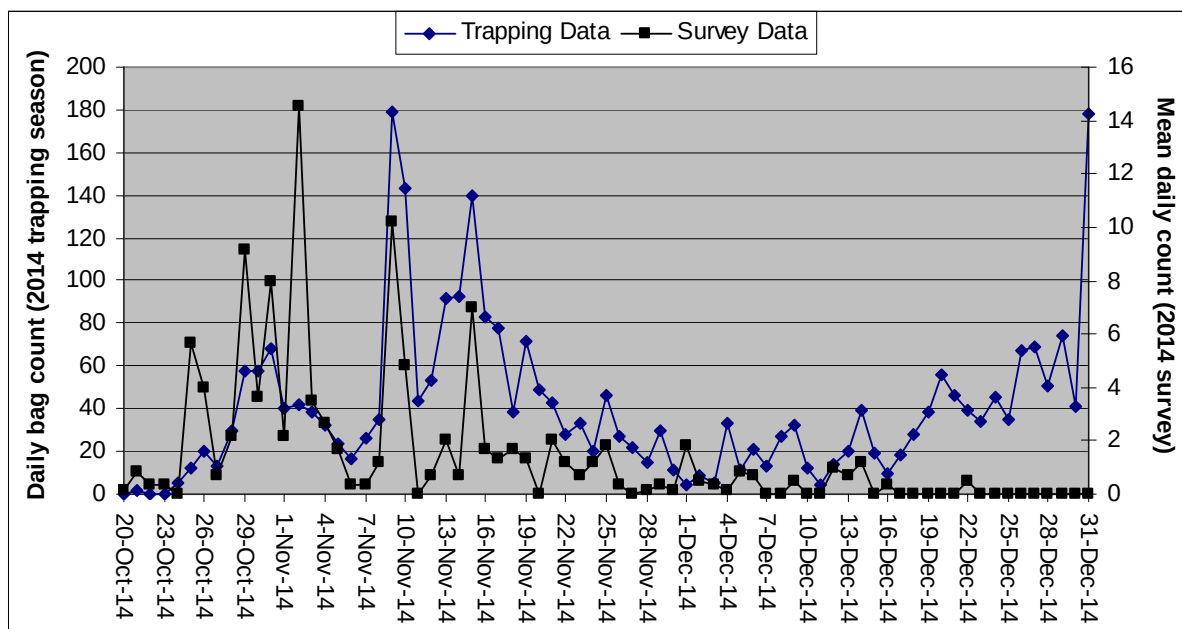


Figure 16. Daily bag count of Linnet during 2014 (blue line; values on left-side y-axis), together with the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

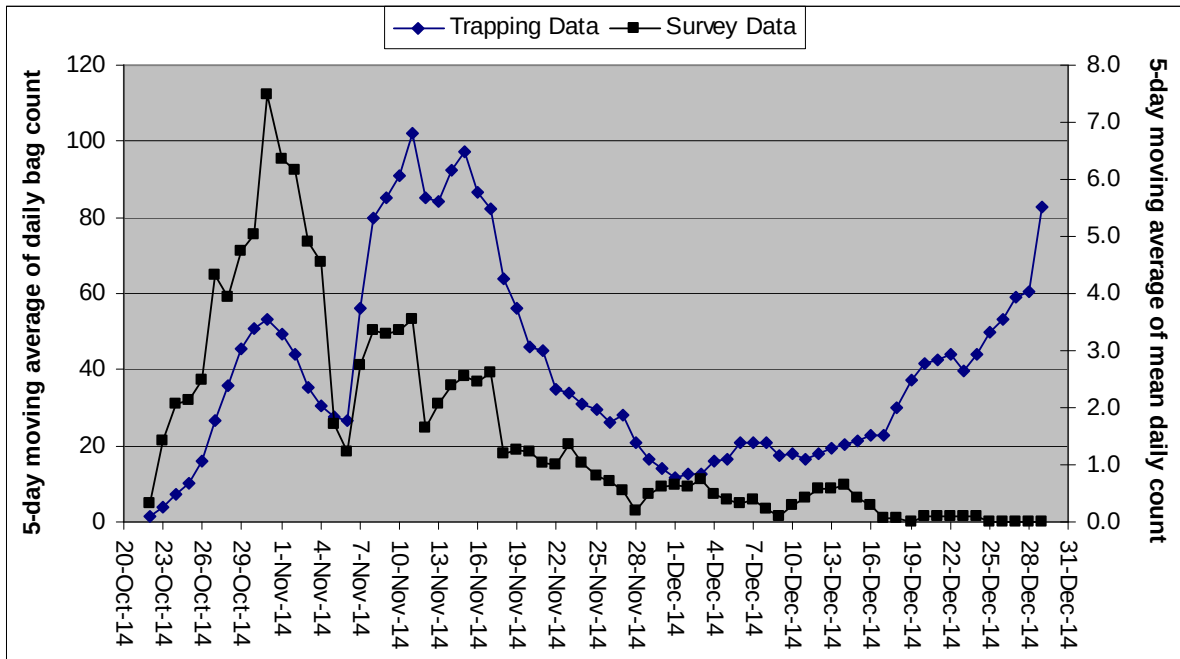


Figure 17. Moving average based on a 5-day rolling time period for the daily bag counts of Linnet during 2014 (blue line; values on left-side y-axis), and for the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

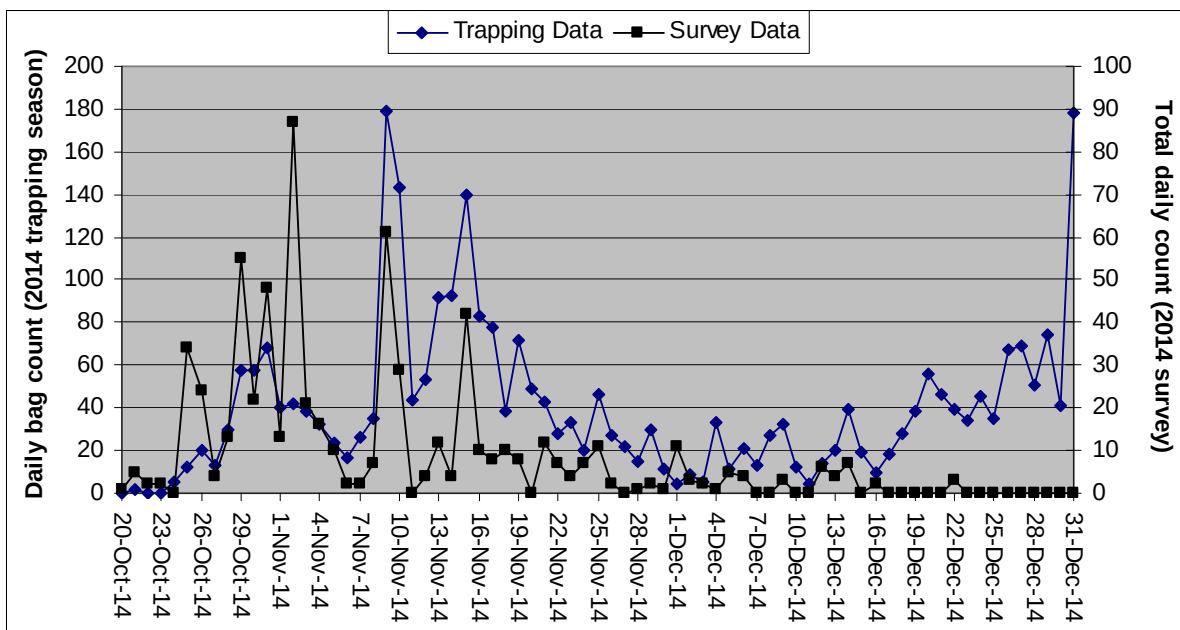


Figure 18. Daily bag count of Linnet during 2014 (blue line; values on left-side y-axis), together with the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

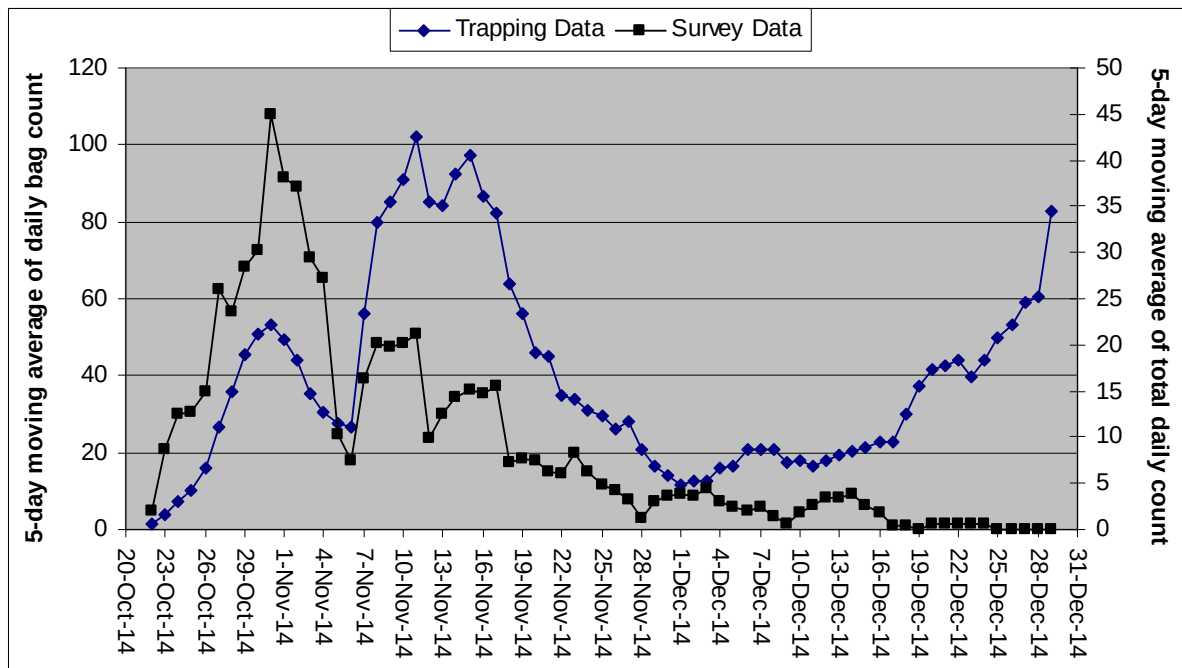


Figure 19. Moving average based on a 5-day rolling time period for the daily bag counts of Linnet during 2014 (blue line; values on left-side y-axis), and for the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

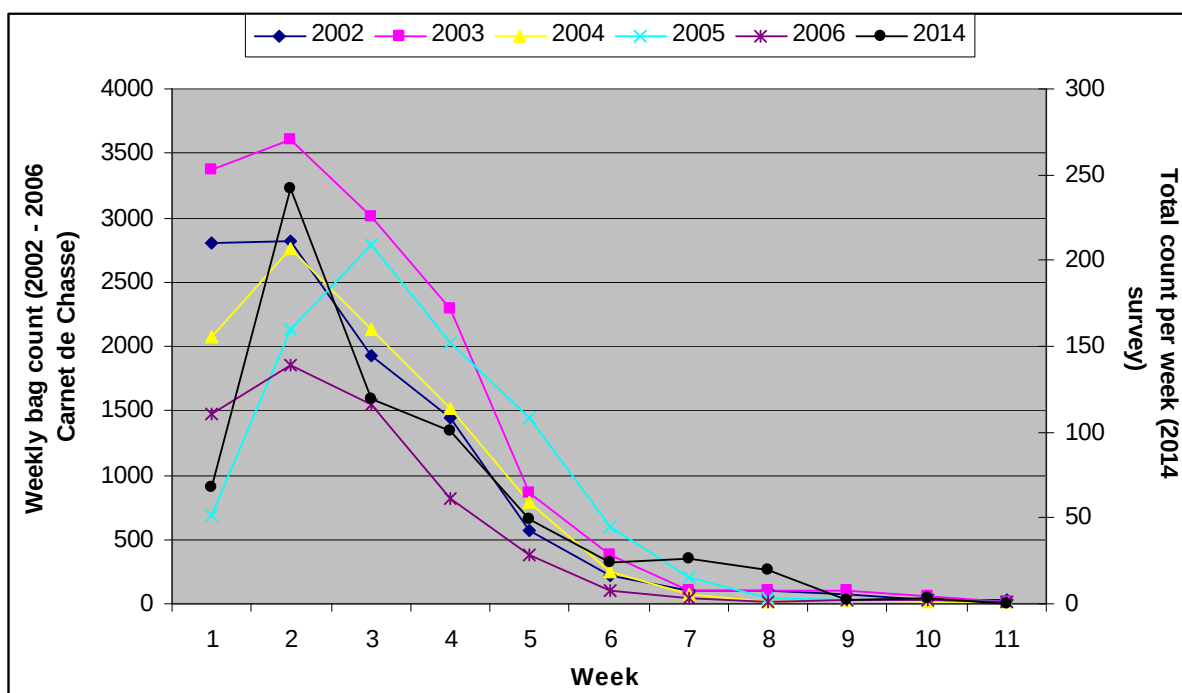


Figure 20. Weekly bag count of Linnet during 2002 – 2006 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per week recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

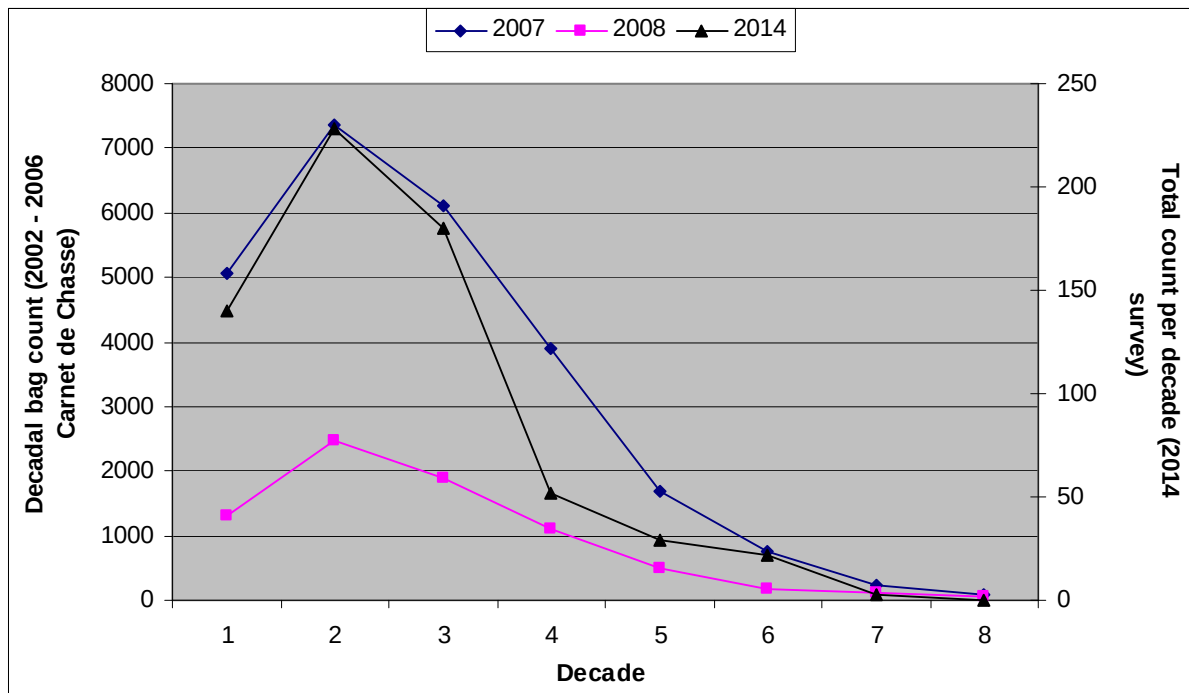


Figure 21. Decadal bag count of Linnet during 2007 – 2008 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per decade recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

Chaffinch

The daily bag counts indicating the number of Chaffinch caught during the 2014 live-capturing season and the mean daily counts of Chaffinch made during the present (2014) survey are shown in Figure 22, while Figure 23 presents the 5-day moving average computed from these data. For reference, Figures 24 – 25 show the same data, but with the results from the present (2014) survey given as total daily counts. For comparison with bag counts made in previous years, Figure 26 shows the weekly bag count for Chaffinch during 2002 – 2006 and corresponding total count per week for the 2014 survey, while Figure 27 shows the decadal bag count for Chaffinch during 2007 – 2008 and corresponding total count per decade for the 2014 survey. As already noted, the magnitudes of the bag counts and those of the mean/total counts made in the 2014 survey are not directly comparable. In fact, the two sets of values are on different scales. Therefore, in Figures 22–27, two separate y-axes are used: the bag count data is plotted on the left-side y-axis, whereas the counts from the 2014 survey are plotted on the right-side y-axis.

Overall, the highest daily counts recorded during the 2014 survey were made in late October and early November, while the highest bag counts were reported during early to mid-November. Thus, the general trend observed in the bag counts for 2014 and daily counts recorded during the 2014 survey is of slightly higher counts in the early part of the live-capturing season, up to around 20 November. Both the number of Chaffinch observed per day during the 2014 survey and the number of Chaffinch caught declined thereafter. Live-capturing reports indicated a marginal increase in the number of Chaffinch caught during the last week of December 2014, whereas the daily counts from the 2014 survey continued to decline until the end of the survey period. When the results from the present survey were compared to the 2002 – 2008 *Carnet de Chasse* data, very similar temporal trends were observed, with higher counts occurring in weeks 1-4 / decades 1-3, corresponding to late October to mid-November, followed by a steady decline until the end of December.

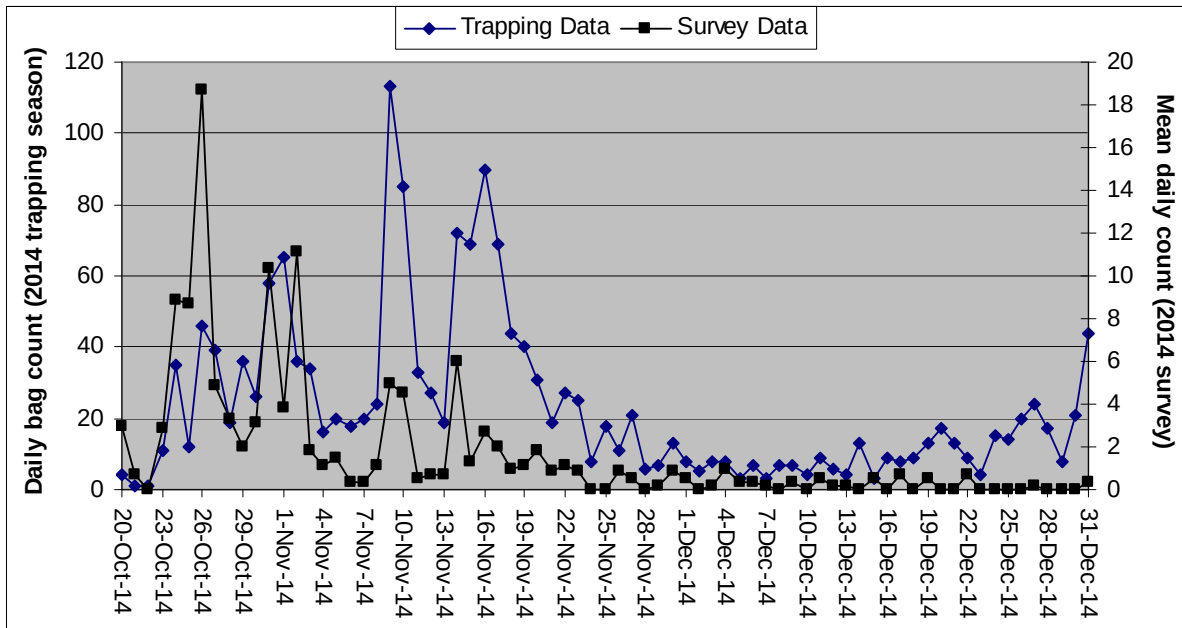


Figure 22. Daily bag count of Chaffinch during 2014 (blue line; values on left-side y-axis), together with the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

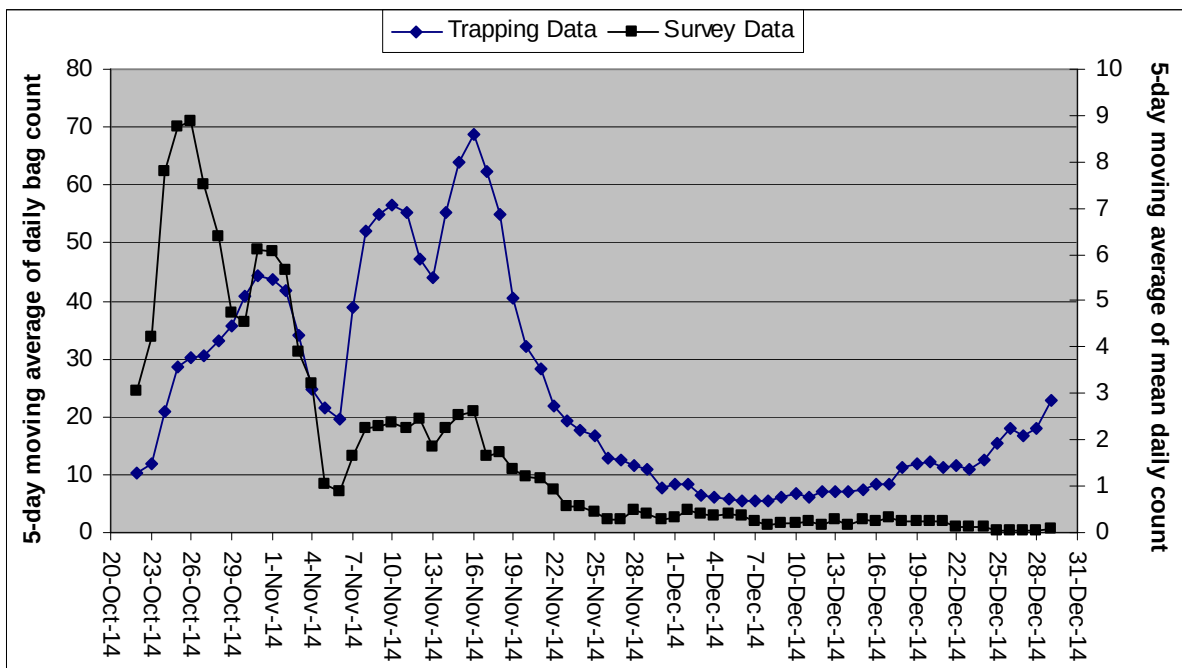


Figure 23. Moving average based on a 5-day rolling time period for the daily bag counts of Chaffinch during 2014 (blue line; values on left-side y-axis), and for the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

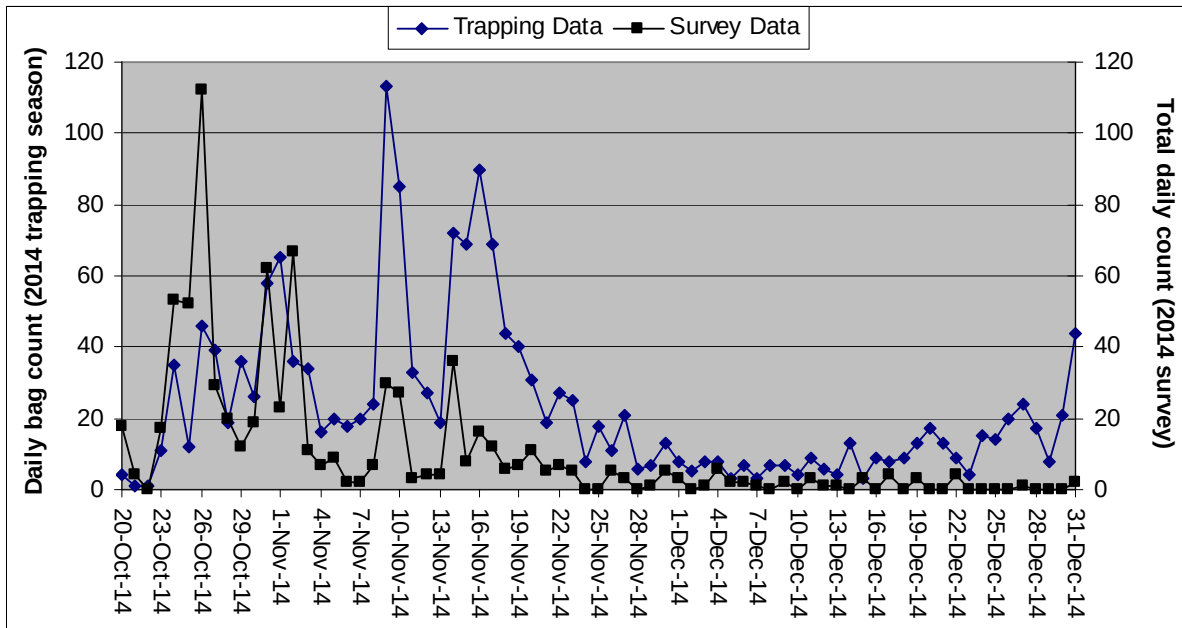


Figure 24. Daily bag count of Chaffinch during 2014 (blue line; values on left-side y-axis), together with the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

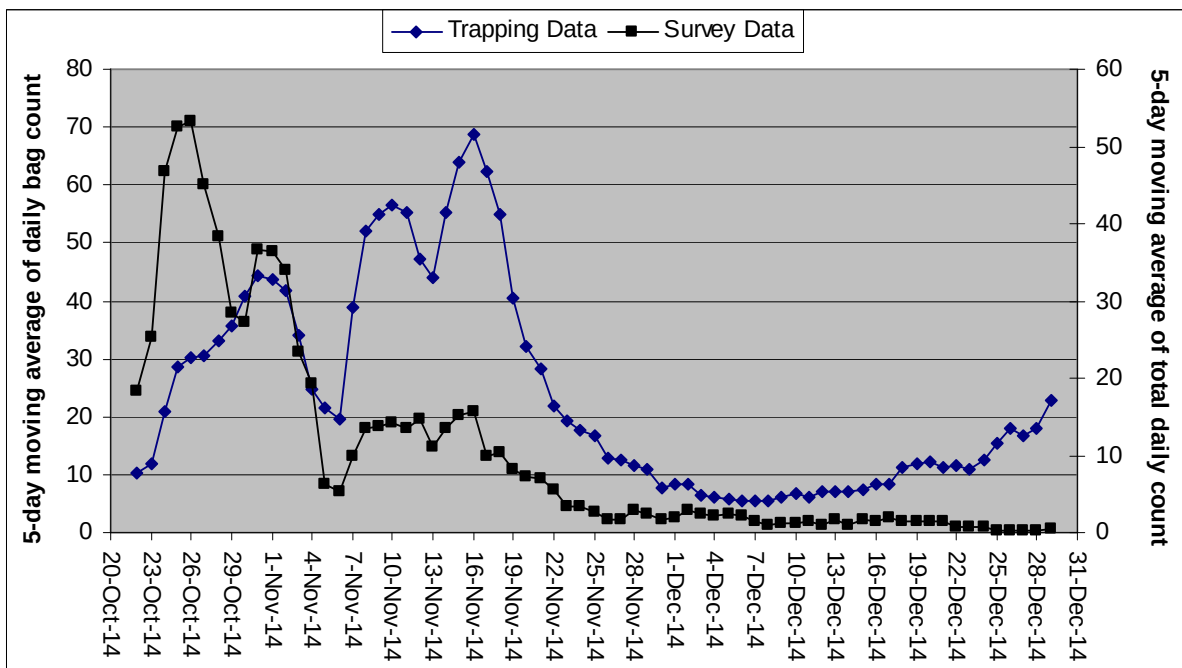


Figure 25. Moving average based on a 5-day rolling time period for the daily bag counts of Chaffinch during 2014 (blue line; values on left-side y-axis), and for the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

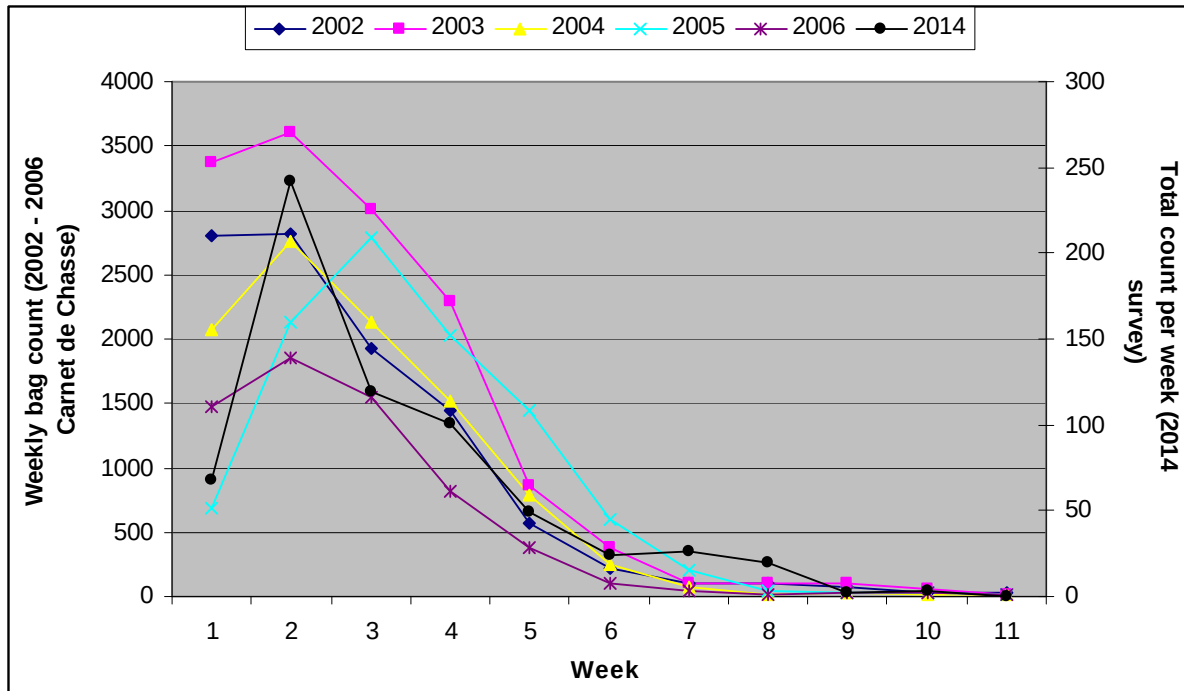


Figure 26. Weekly bag count of Chaffinch during 2002 – 2006 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per week recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

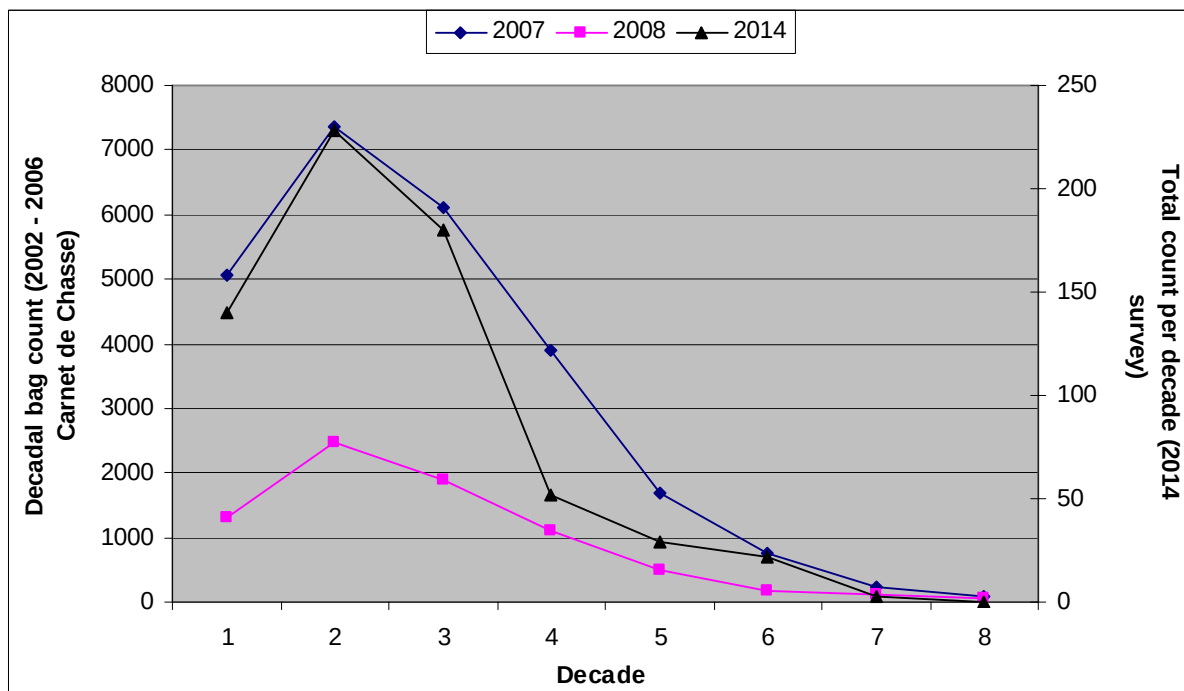


Figure 27. Decadal bag count of Chaffinch during 2007 – 2008 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per decade recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

Greenfinch

The daily bag counts indicating the number of Greenfinch caught during the 2014 live-capturing season and the mean daily counts of Greenfinch made during the present (2014) survey are shown in Figure 28, while Figure 29 presents the 5-day moving average computed from these data. For reference, Figures 30 – 31 show the same data, but with the results from the present (2014) survey given as total daily counts. For comparison with bag counts made in previous years, Figure 32 shows the weekly bag count for Greenfinch during 2002 – 2006 and corresponding total count per week for the 2014 survey, while Figure 33 shows the decadal bag count for Greenfinch during 2007 – 2008 and corresponding total count per decade for the 2014 survey. As already noted, the magnitudes of the bag counts and those of the mean/total counts made in the 2014 survey are not directly comparable. In fact, the two sets of values are on different scales. Therefore, in Figures 28–33, two separate y-axes are used: the bag count data is plotted on the left-side y-axis, whereas the counts from the 2014 survey are plotted on the right-side y-axis.

Overall, the highest daily counts made during the 2014 survey occurred between late October and mid-November, while the highest bag counts occurred in mid-November. Thus, the general trend observed in the bag counts for 2014 and daily counts recorded during the 2014 survey is of slightly higher counts in the early part of the live-capturing season, up to around 25 November. Thereafter, lower values for the number of Greenfinch observed per day during the 2014 survey and for the number of Greenfinch caught were recorded. Live-capturing reports indicated a slight increase in the number of Greenfinch caught during the last week of December 2014, whereas the daily counts from the 2014 survey continued to decline until the end of the survey period. When the results from the present survey were compared to the 2002 – 2008 *Carnet de Chasse* data, very similar temporal trends were observed, with higher counts occurring in weeks 2-4 / decades 2-3, corresponding to early to mid-November, followed by a steady decline until the end of December.

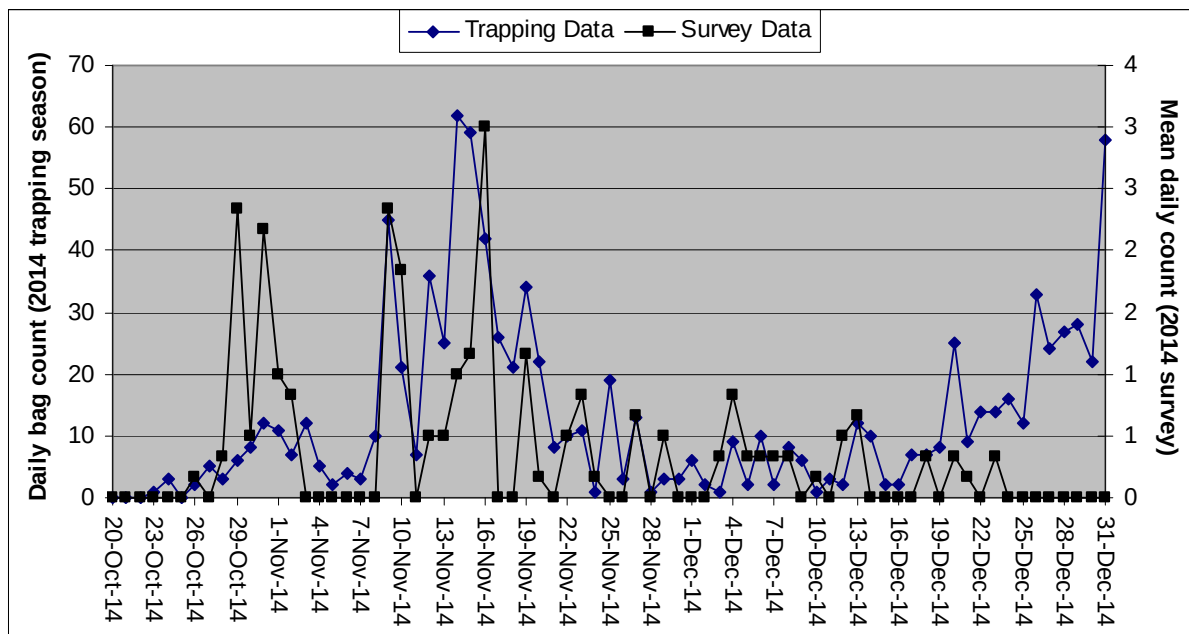


Figure 28. Daily bag count of Greenfinch during 2014 (blue line; values on left-side y-axis), together with the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

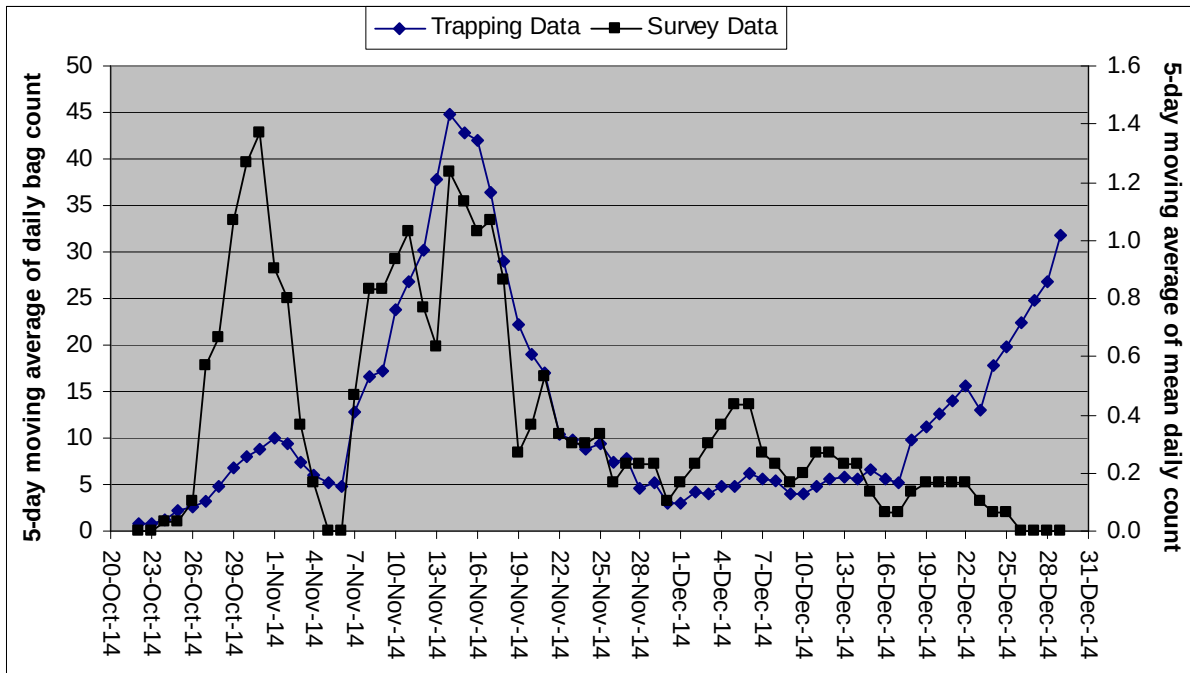


Figure 29. Moving average based on a 5-day rolling time period for the daily bag counts of Greenfinch during 2014 (blue line; values on left-side y-axis), and for the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

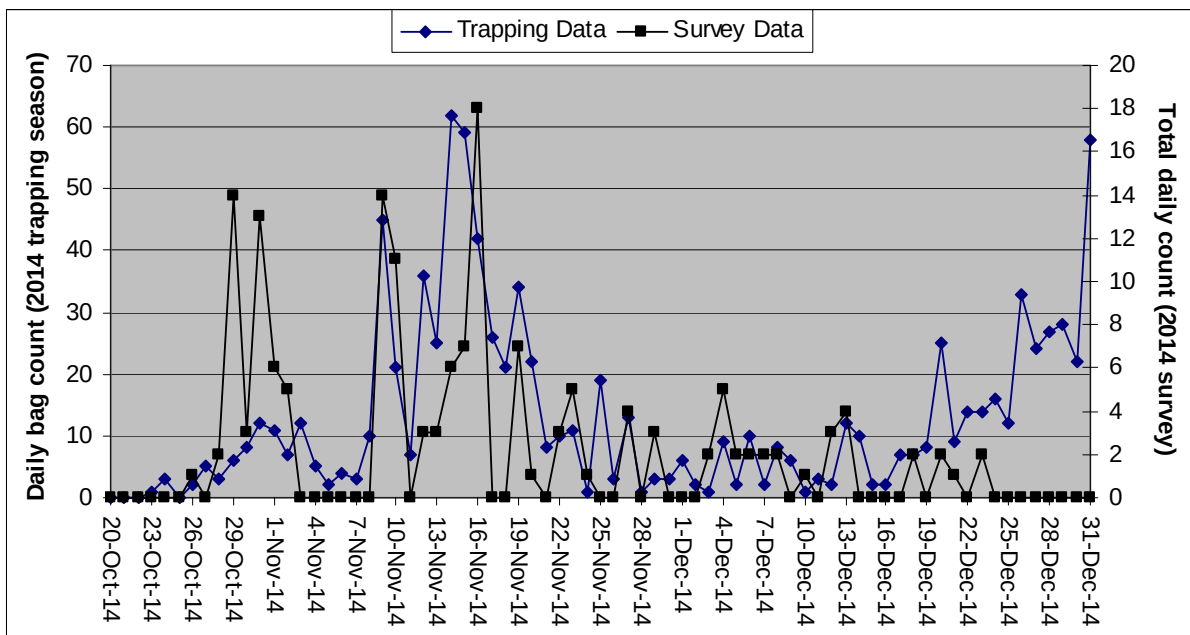


Figure 30. Daily bag count of Greenfinch during 2014 (blue line; values on left-side y-axis), together with the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

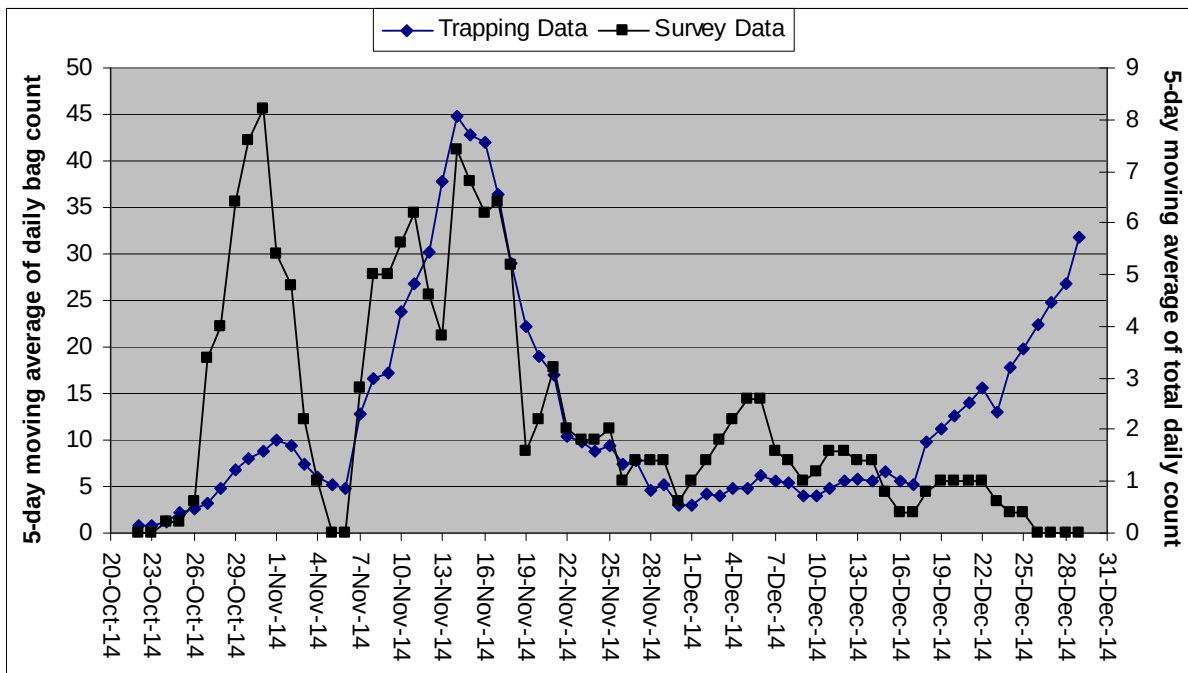


Figure 31. Moving average based on a 5-day rolling time period for the daily bag counts of Greenfinch during 2014 (blue line; values on left-side y-axis), and for the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

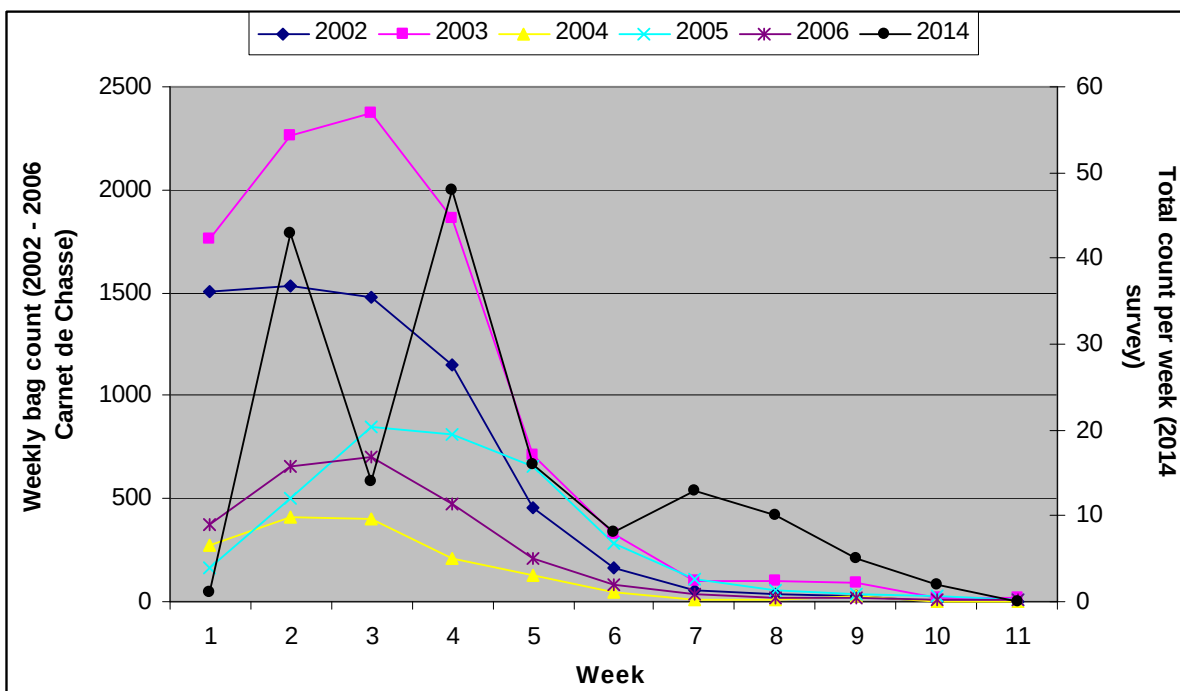


Figure 32. Weekly bag count of Greenfinch during 2002 – 2006 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per week recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

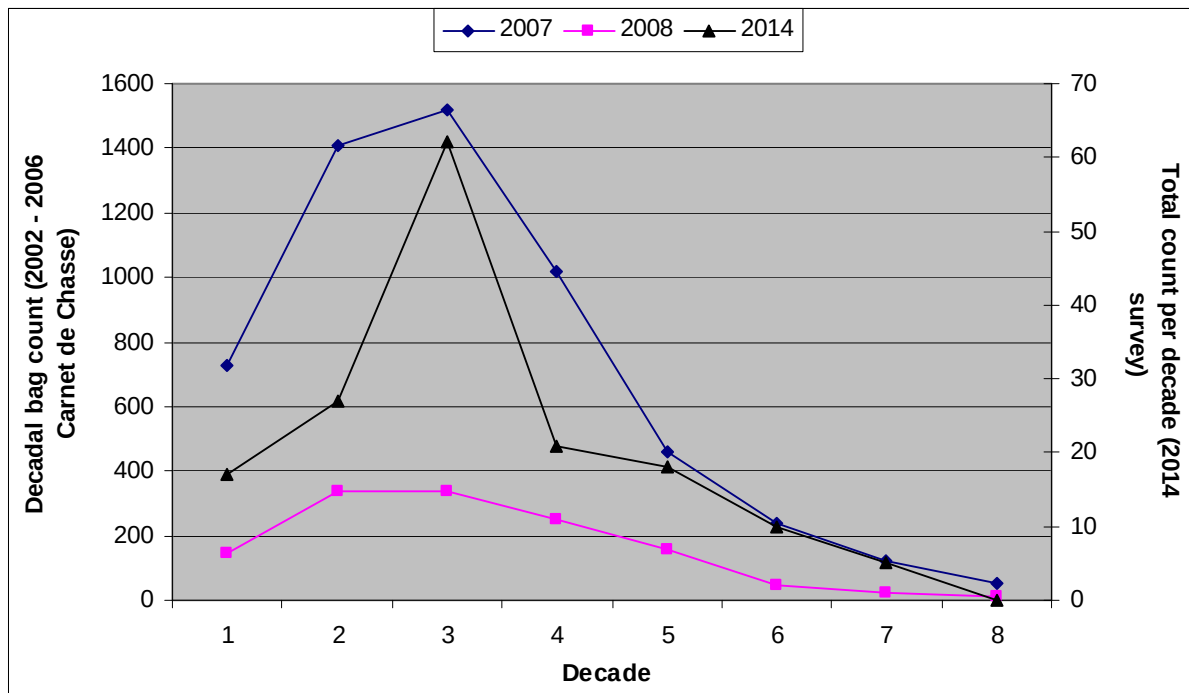


Figure 33. Decadal bag count of Greenfinch during 2007 – 2008 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per decade recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

Siskin

The daily bag counts indicating the number of Siskin caught during the 2014 live-capturing season and the mean daily counts of Siskin made during the present (2014) survey are shown in Figure 34, while Figure 35 presents the 5-day moving average computed from these data. For reference, Figures 36 – 37 show the same data, but with the results from the present (2014) survey given as total daily counts. For comparison with bag counts made in previous years, Figure 38 shows the weekly bag count for Siskin during 2002 – 2006 and corresponding total count per week for the 2014 survey. In Figure 38, the temporal trend in data for the years 2002, 2003, 2004 and 2006 is not clearly visible because the *Carnet de Chasse* counts for 2005 were much higher; therefore the Figure 39 shows the same data as in Figure 38, but omitting the 2005 bag data. Figure 40 shows the decadal bag count for Siskin during 2007 – 2008 and corresponding total count per decade for the 2014 survey. As already noted, the magnitudes of the bag counts and those of the mean/total counts made in the 2014 survey are not directly comparable. In fact, the two sets of values are on different scales. Therefore, in Figures 34–40, two separate y-axes are used: the bag count data is plotted on the left-side y-axis, whereas the counts from the 2014 survey are plotted on the right-side y-axis.

During the 2014 survey, the only relatively high count for Siskin was recorded on 2 November 2014, while very low counts were made on all of the other days during the survey. Thus inferences on temporal trends in migration rates cannot be drawn based on this data. The bag counts for this species do not show any peaks, with similar counts being made between late October and late November. Bag counts during early December were slightly lower but increased again towards the end of the month. In the 2002 – 2008 *Carnet de Chasse* data, similar temporal trends were observed over the years, with higher counts occurring in weeks 1–5 / decades 1–3, corresponding to late October to late November, and a subsequent decline in counts during December.

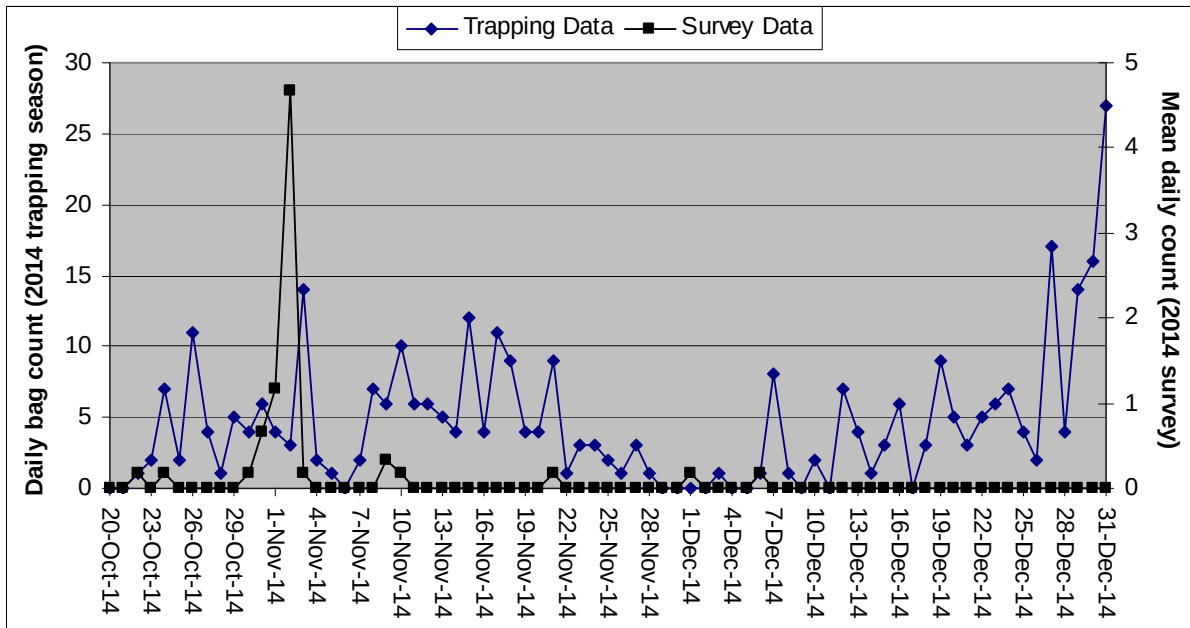


Figure 34. Daily bag count of Siskin during 2014 (blue line; values on left-side y-axis), together with the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

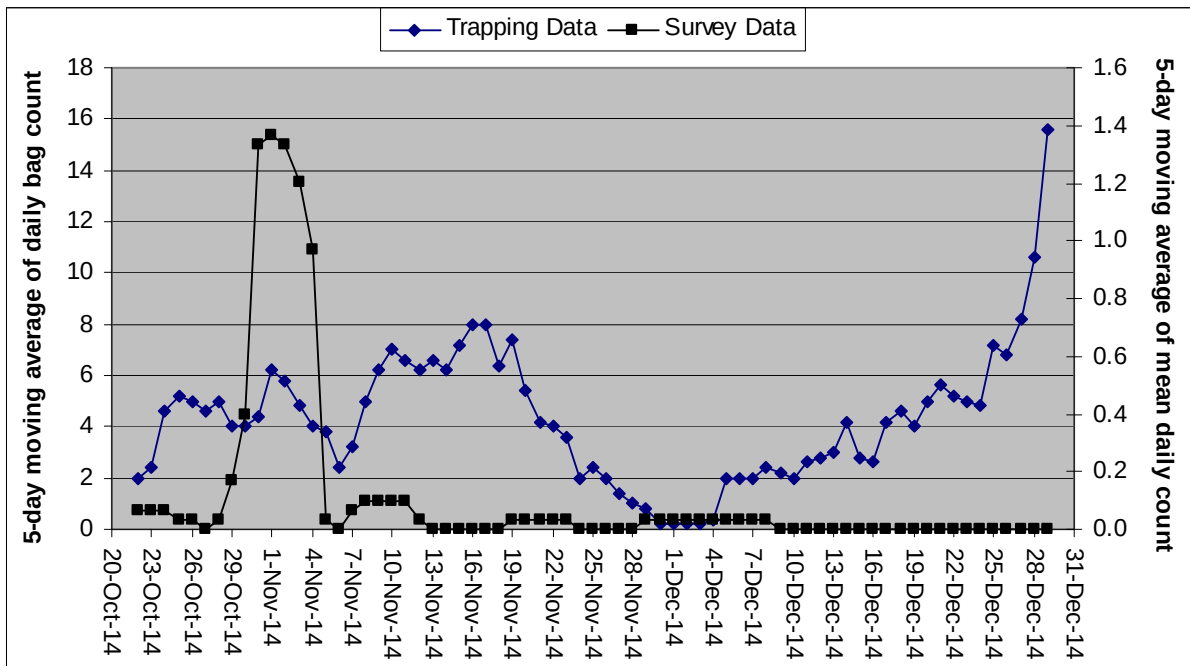


Figure 35. Moving average based on a 5-day rolling time period for the daily bag counts of Siskin during 2014 (blue line; values on left-side y-axis), and for the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

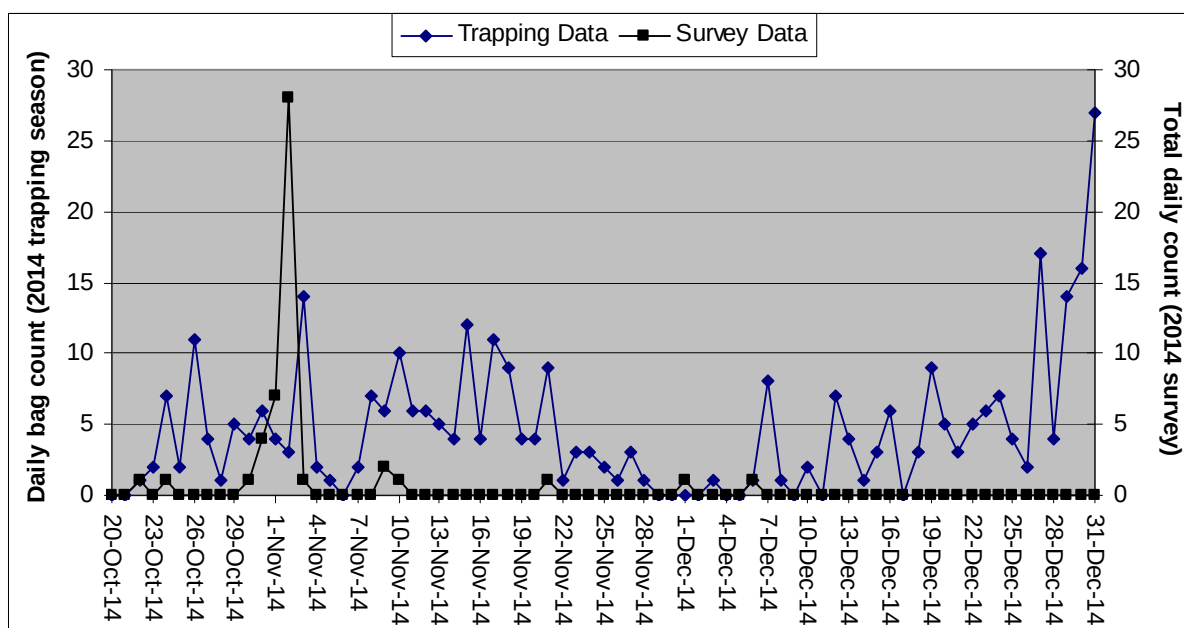


Figure 36. Daily bag count of Siskin during 2014 (blue line; values on left-side y-axis), together with the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

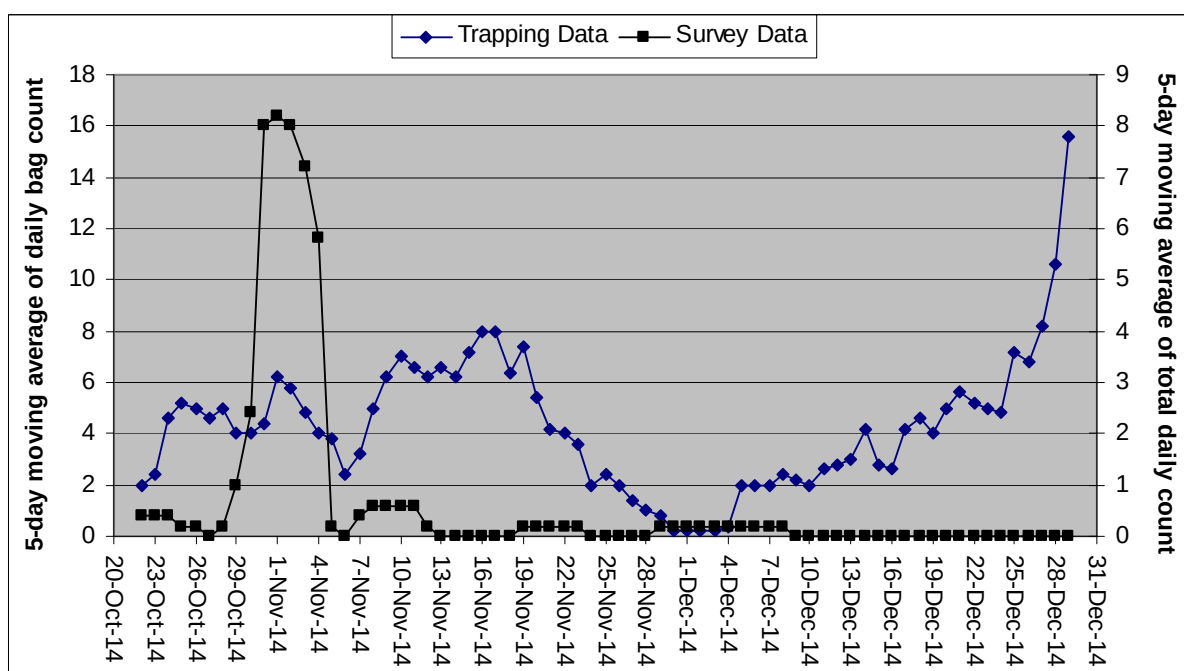


Figure 37. Moving average based on a 5-day rolling time period for the daily bag counts of Siskin during 2014 (blue line; values on left-side y-axis), and for the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

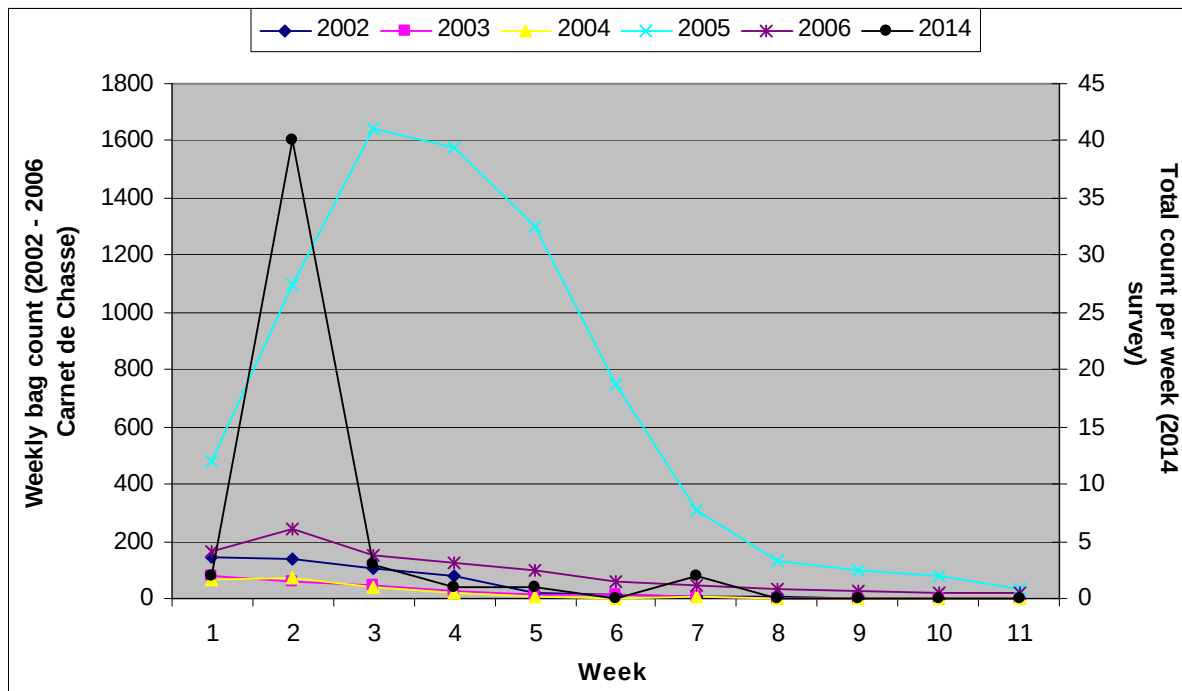


Figure 38. Weekly bag count of Siskin during 2002 – 2006 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per week recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

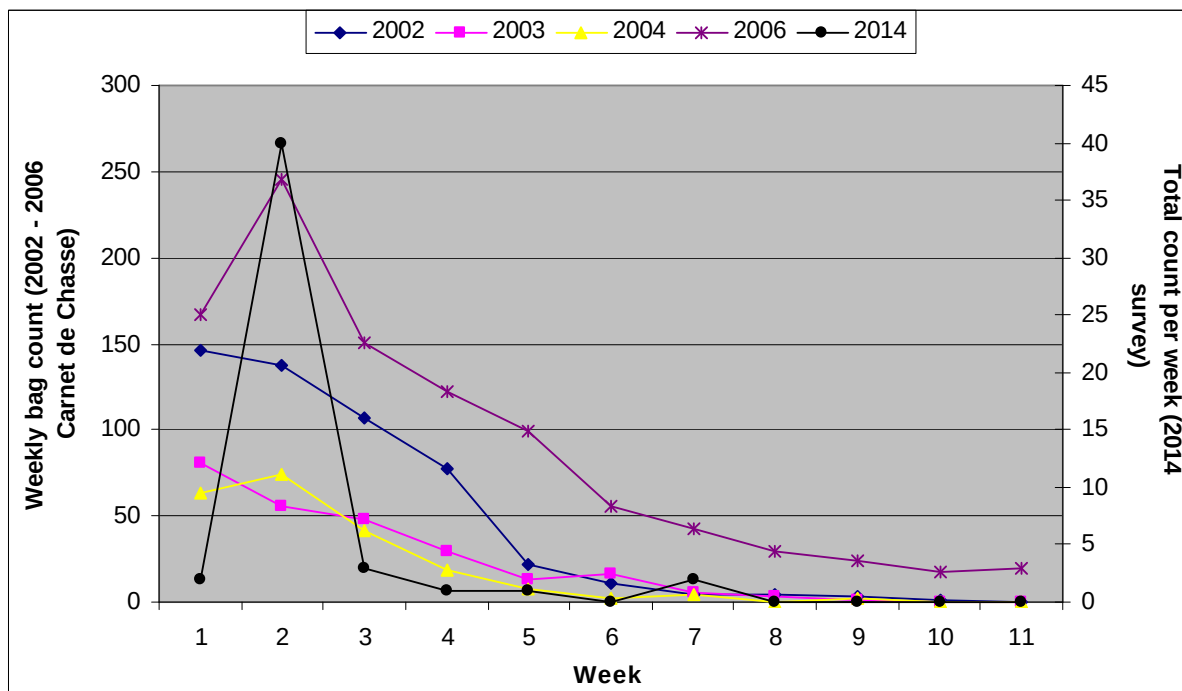


Figure 39. Weekly bag count of Siskin during 2002 – 2004 and 2006 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per week recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

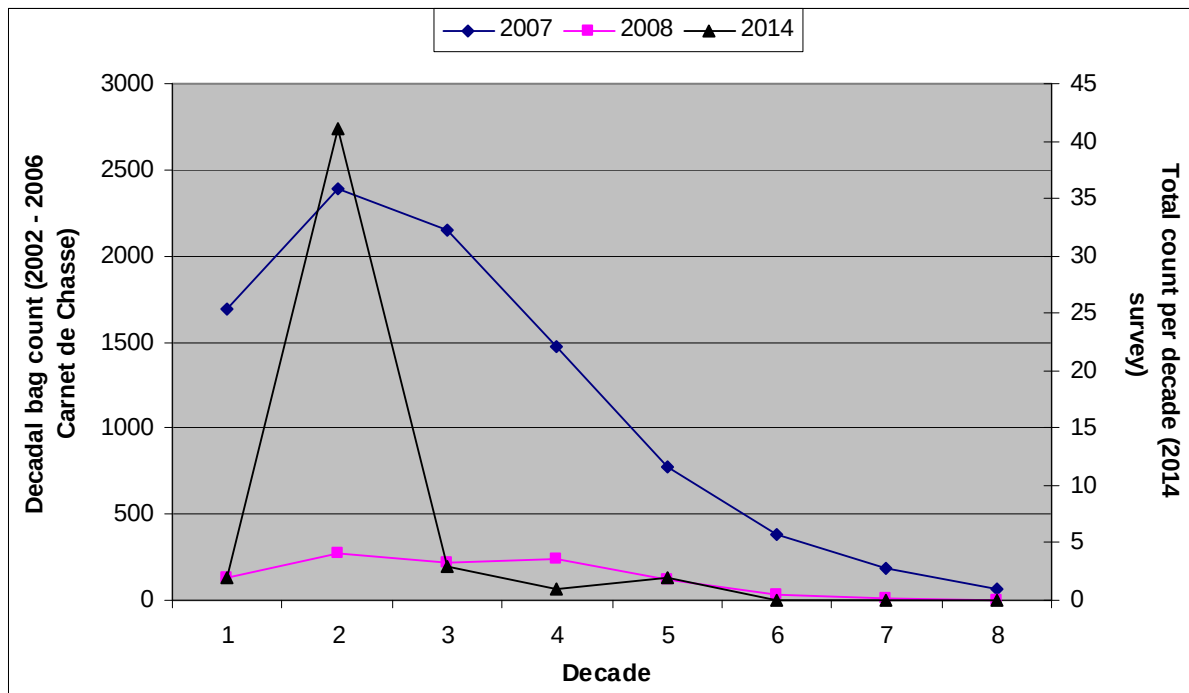


Figure 40. Decadal bag count of Siskin during 2007 – 2008 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per decade recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

Goldfinch

The daily bag counts indicating the number of Goldfinch caught during the 2014 live-capturing season and the mean daily counts of Goldfinch made during the present (2014) survey are shown in Figure 41, while Figure 42 presents the 5-day moving average computed from these data. For reference, Figures 43 – 44 show the same data, but with the results from the present (2014) survey given as total daily counts. For comparison with bag counts made in previous years, Figure 45 shows the weekly bag count for Goldfinch during 2002 – 2006 and corresponding total count per week for the 2014 survey, while Figure 46 shows the decadal bag count for Goldfinch during 2007 – 2008 and corresponding total count per decade for the 2014 survey. As already noted, the magnitudes of the bag counts and those of the mean/total counts made in the 2014 survey are not directly comparable. In fact, the two sets of values are on different scales. Therefore, in Figures 41–46, two separate y-axes are used: the bag count data is plotted on the left-side y-axis, whereas the counts from the 2014 survey are plotted on the right-side y-axis.

Overall, very low counts for Goldfinch were recorded during the 2014 survey. Thus inferences on temporal trends in migration rates cannot be drawn based on this data. The bag counts for this species do not show any peaks: similar counts were made between early November and late December, with counts increasing slightly during the last week of December. In the 2002 – 2008 *Carnet de Chasse* data, similar temporal trends were observed over the years, with higher counts occurring in weeks 1-3 / decades 1-2, corresponding to late October to mid-November, and a subsequent decline in counts until the end of December.

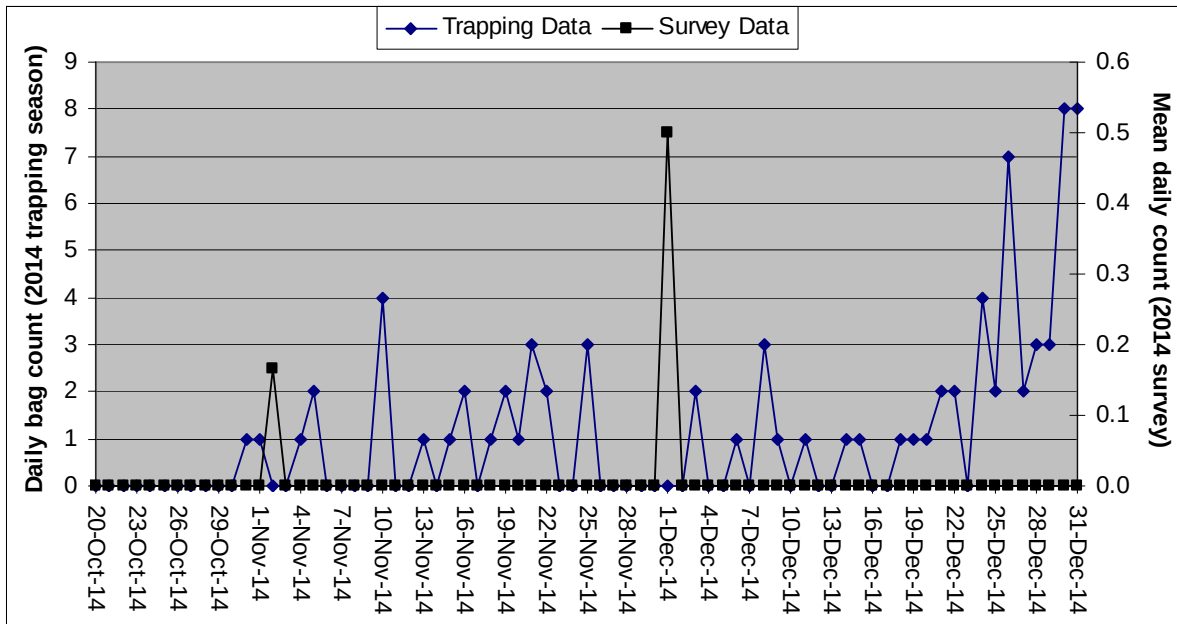


Figure 41. Daily bag count of Goldfinch during 2014 (blue line; values on left-side y-axis), together with the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

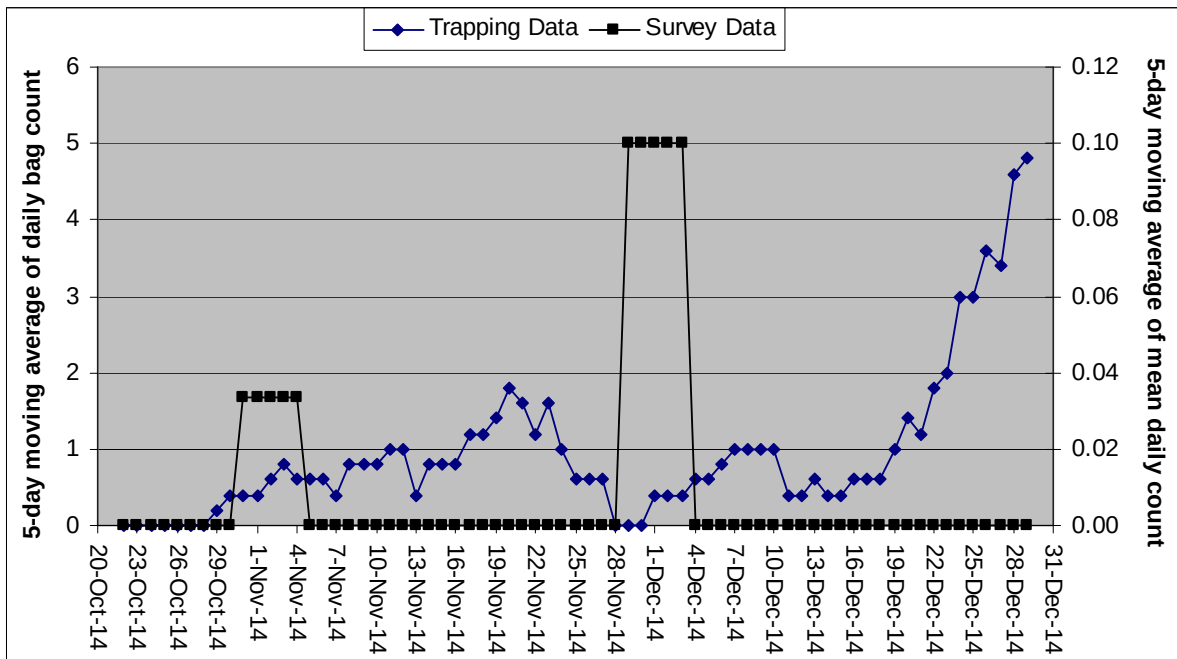


Figure 42. Moving average based on a 5-day rolling time period for the daily bag counts of Goldfinch during 2014 (blue line; values on left-side y-axis), and for the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

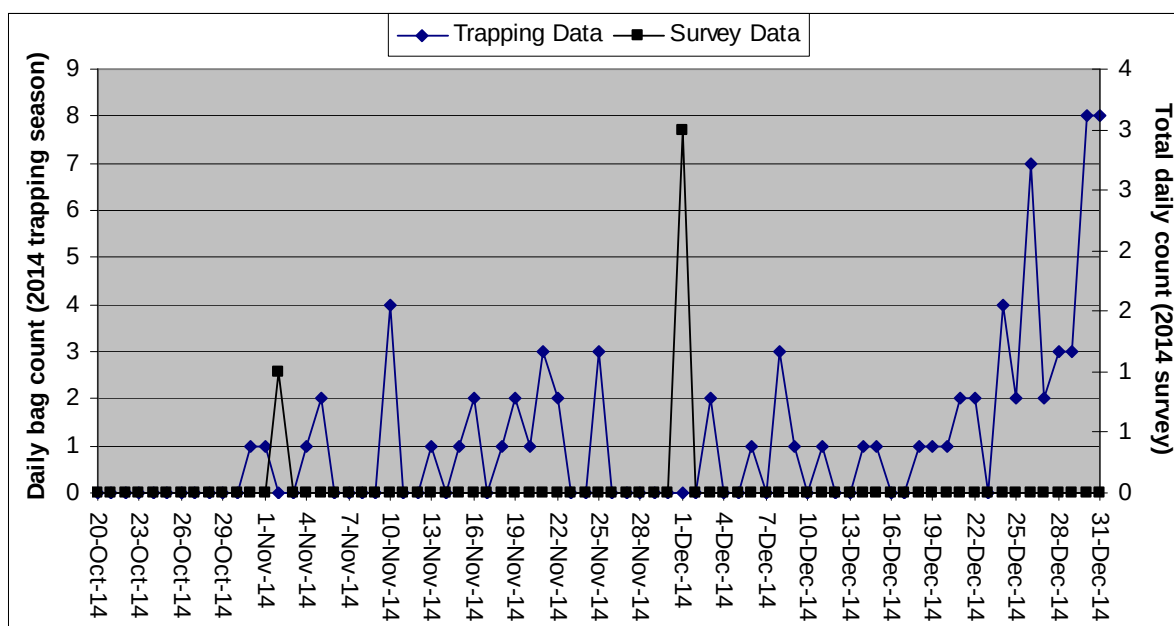


Figure 43. Daily bag count of Goldfinch during 2014 (blue line; values on left-side y-axis), together with the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

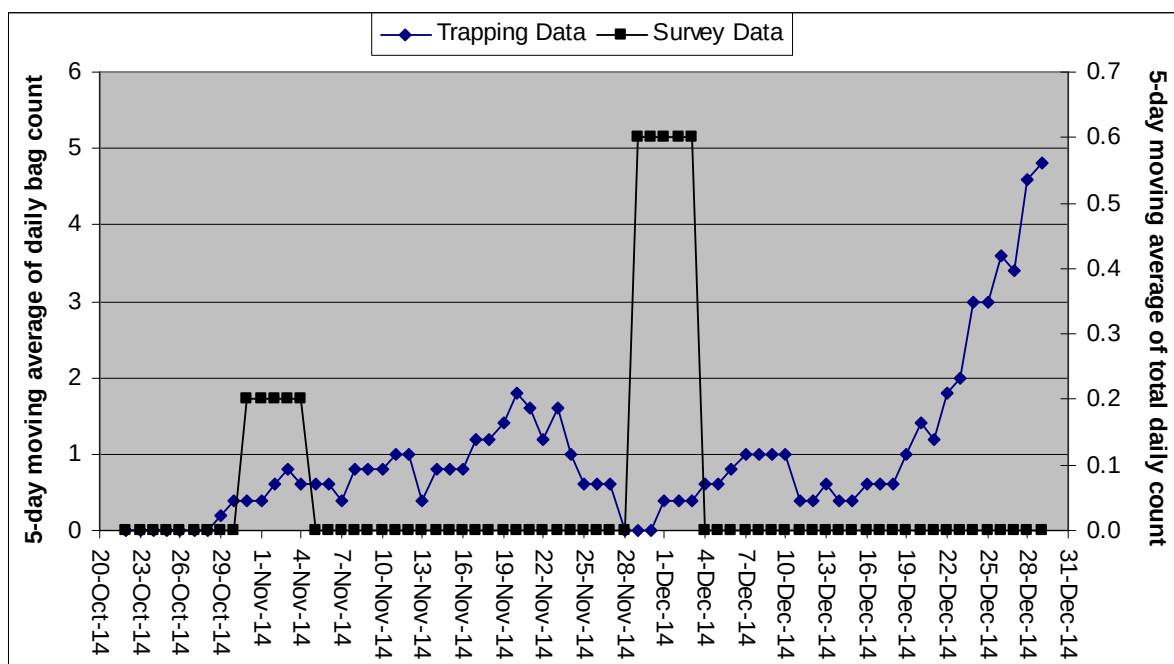


Figure 44. Moving average based on a 5-day rolling time period for the daily bag counts of Goldfinch during 2014 (blue line; values on left-side y-axis), and for the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

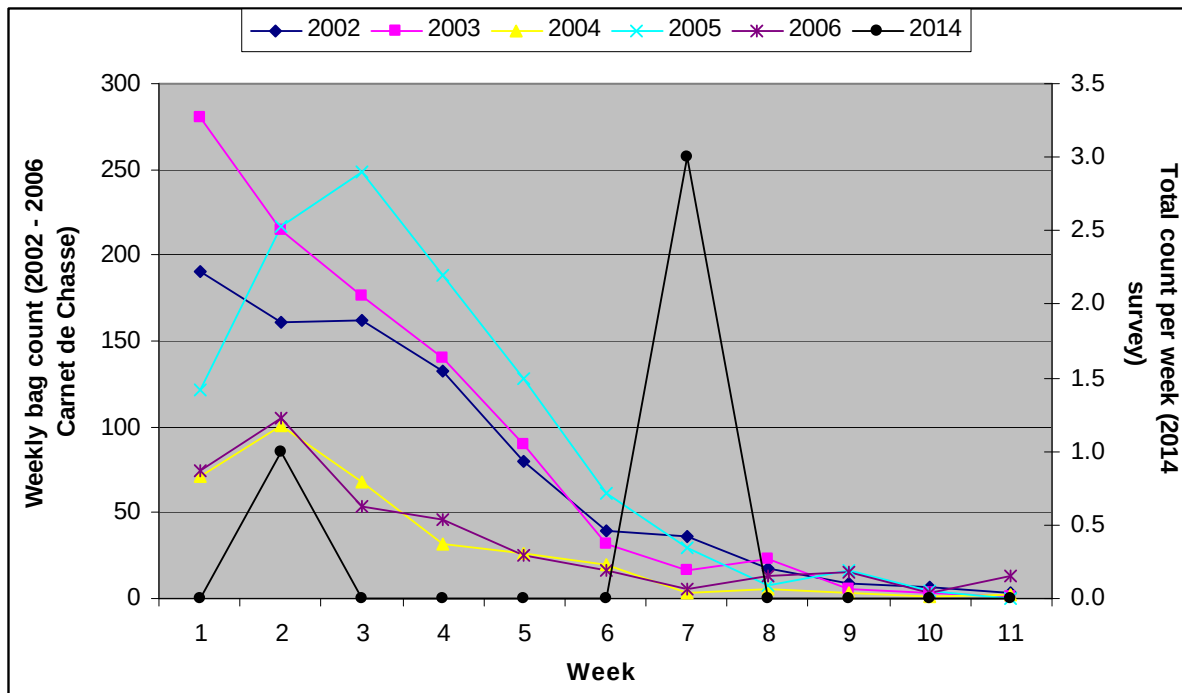


Figure 45. Weekly bag count of Goldfinch during 2002 – 2006 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per week recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

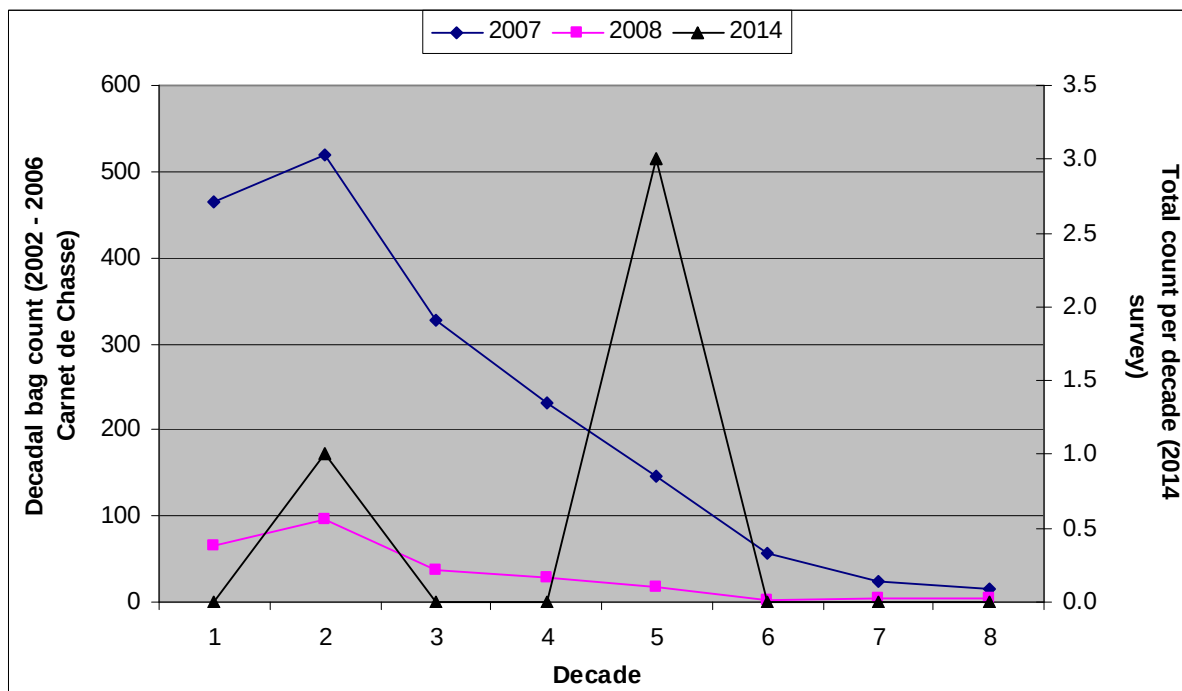


Figure 46. Decadal bag count of Goldfinch during 2007 – 2008 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per decade recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

Serin

The daily bag counts indicating the number of Serin caught during the 2014 live-capturing season and the mean daily counts of Serin made during the present (2014) survey are shown in Figure 47, while Figure 48 presents the 5-day moving average computed from these data. For reference, Figures 49 – 50 show the same data, but with the results from the present (2014) survey given as total daily counts. For comparison with bag counts made in previous years, Figure 51 shows the weekly bag count for Serin during 2002 – 2006 and corresponding total count per week for the 2014 survey, while Figure 52 shows the decadal bag count for Serin during 2007 – 2008 and corresponding total count per decade for the 2014 survey. As already noted, the magnitudes of the bag counts and those of the mean/total counts made in the 2014 survey are not directly comparable. In fact, the two sets of values are on different scales. Therefore, in Figures 47–52, two separate y-axes are used: the bag count data is plotted on the left-side y-axis, whereas the counts from the 2014 survey are plotted on the right-side y-axis.

Overall, the highest daily counts recorded during the 2014 survey were made between late October and late November, with relatively higher counts being made in early to mid-November, and coinciding with a peak in the bag counts reported over the same time period. Thus, the general trend observed in the bag counts for 2014 and daily counts recorded during the 2014 survey is of slightly higher counts in the early part of the live-capturing season, up to around 25 November. Both the number of Serin observed per day during the 2014 survey and the number of Serin caught declined thereafter. Live-capturing reports indicated an increase in the number of Serin caught during the last two weeks of December 2014; the daily counts from the 2014 survey showed a very marginal increase during the third week of December and subsequently declined until the end of the survey period. When the results from the present survey were compared to the 2002 – 2008 *Carnet de Chasse* data, very similar temporal trends were observed, with higher counts occurring in weeks 2-4 / decades 2-3, corresponding to early to mid-November, followed by a steady decline until weeks 7-8 / decades 5-6, and a subsequent increase in mid-December (weeks 9-10 / decade 7) followed by a decline until the end of December.

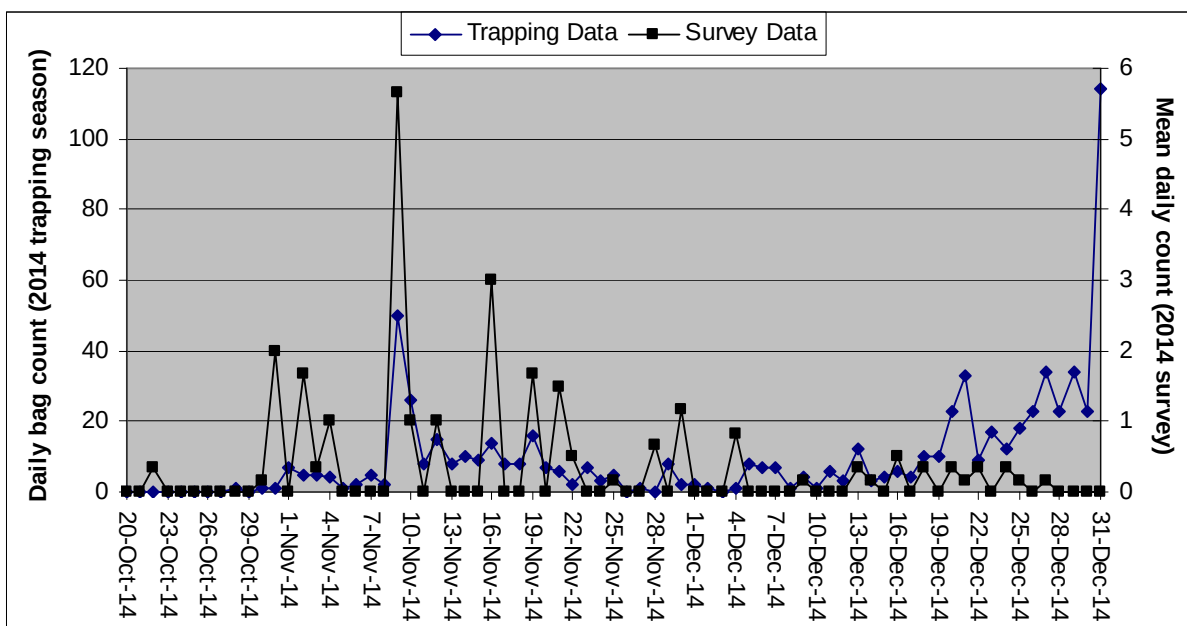


Figure 47. Daily bag count of Serin during 2014 (blue line; values on left-side y-axis), together with the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

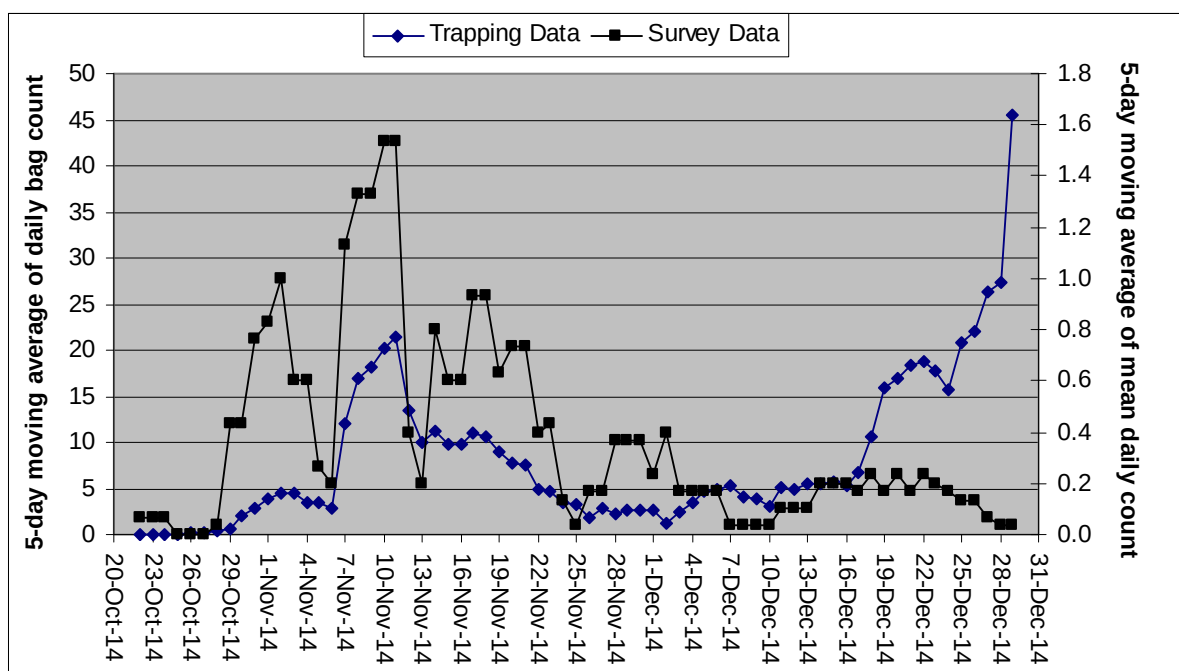


Figure 48. Moving average based on a 5-day rolling time period for the daily bag counts of Serin during 2014 (blue line; values on left-side y-axis), and for the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

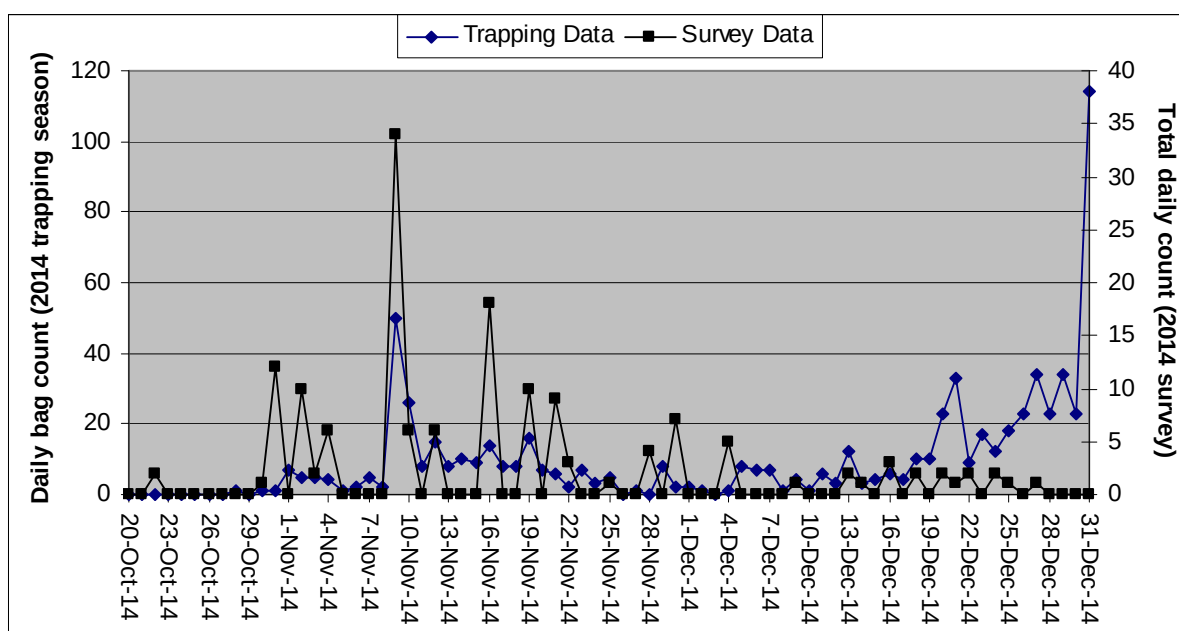


Figure 49. Daily bag count of Serin during 2014 (blue line; values on left-side y-axis), together with the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

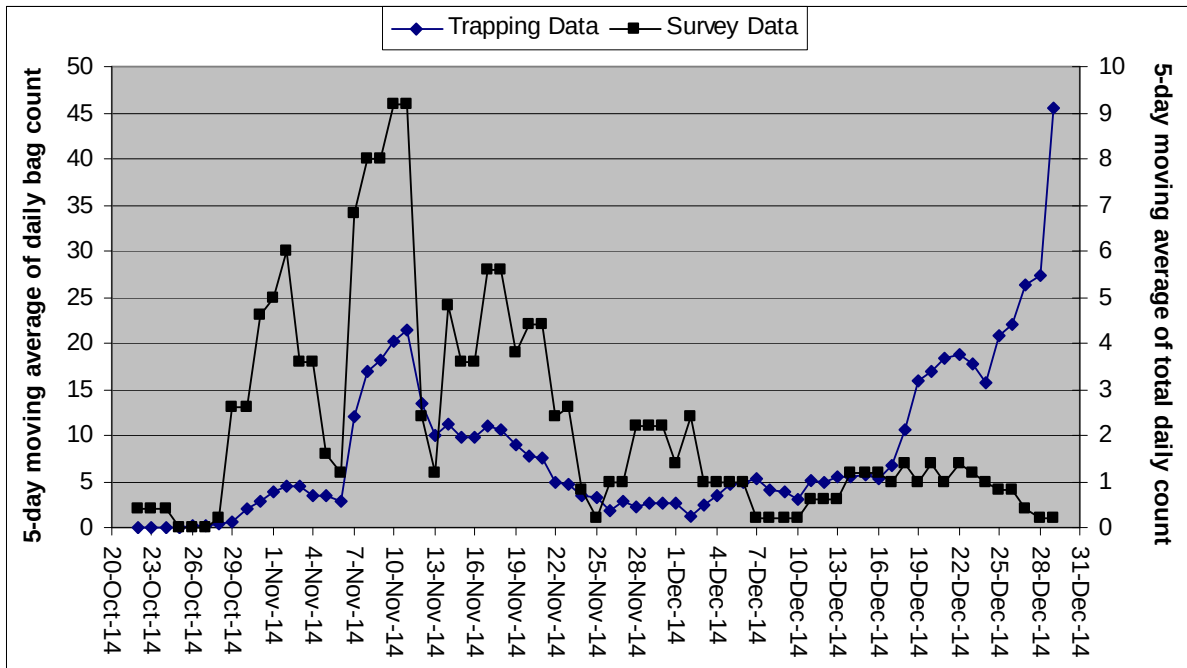


Figure 50. Moving average based on a 5-day rolling time period for the daily bag counts of Serin during 2014 (blue line; values on left-side y-axis), and for the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

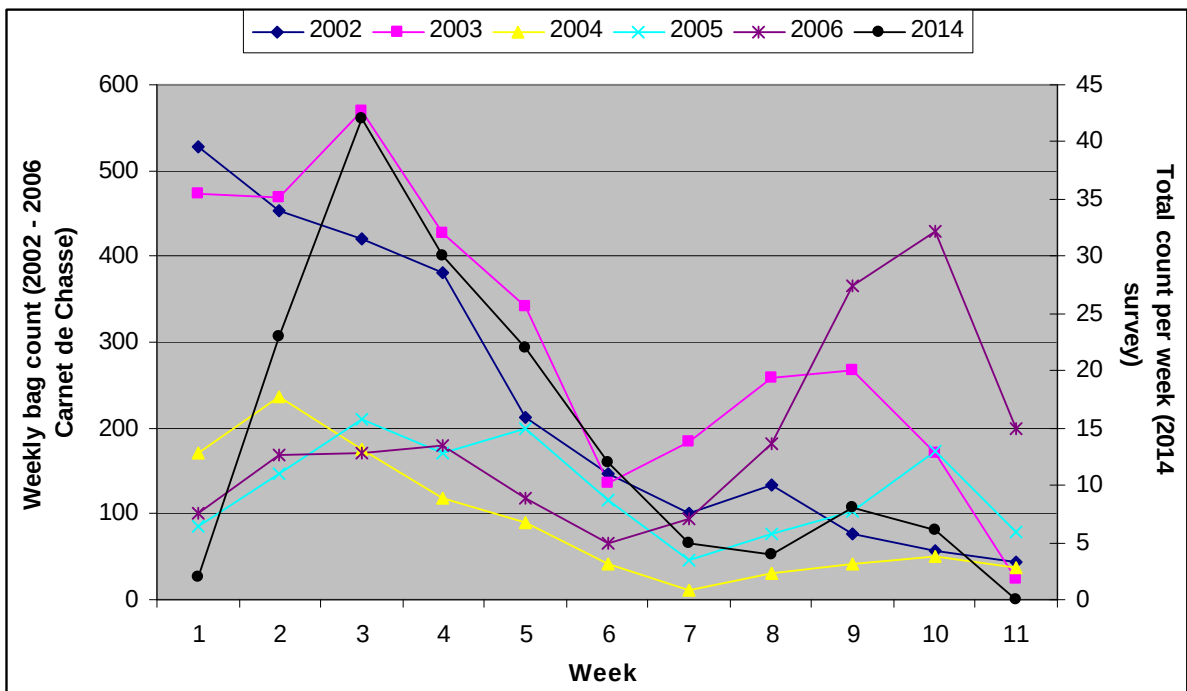


Figure 51. Weekly bag count of Serin during 2002 – 2006 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per week recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

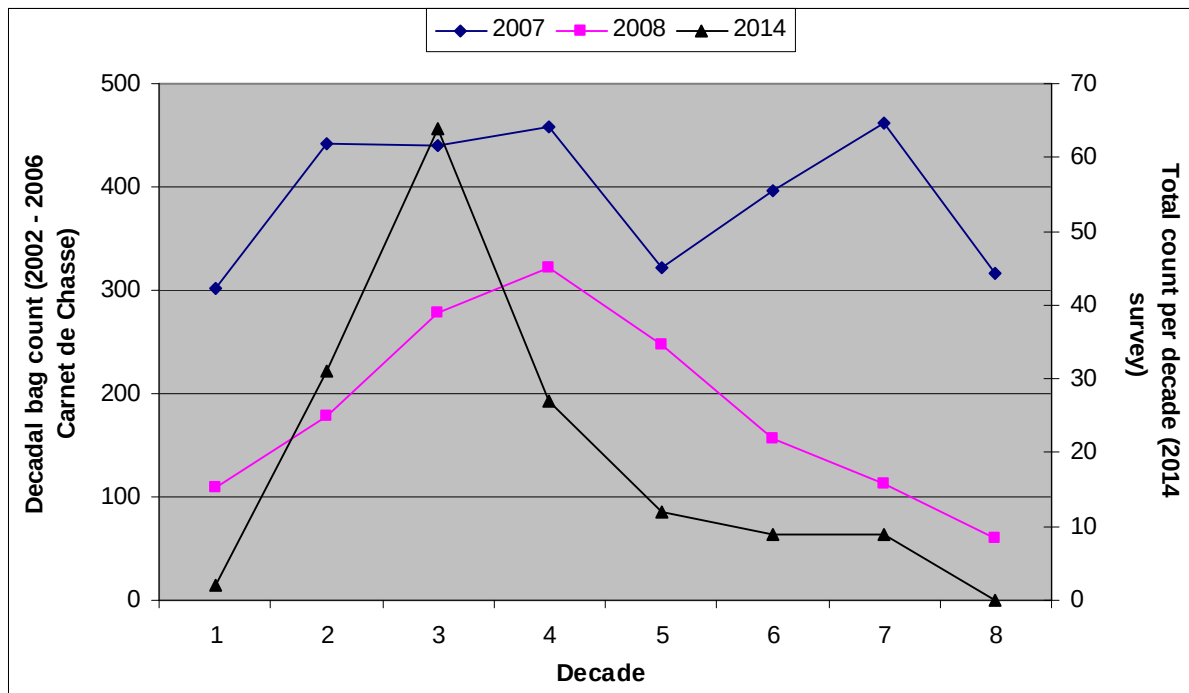


Figure 52. Decadal bag count of Serin during 2007 – 2008 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per decade recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

Hawfinch

The daily bag counts indicating the number of Hawfinch caught during the 2014 live-capturing season and the mean daily counts of Hawfinch made during the present (2014) survey are shown in Figure 53, while Figure 54 presents the 5-day moving average computed from these data. For reference, Figures 55–56 show the same data, but with the results from the present (2014) survey given as total daily counts. For comparison with bag counts made in previous years, Figure 57 shows the weekly bag count for Hawfinch during 2002 – 2006 and corresponding total count per week for the 2014 survey, while Figure 58 shows the decadal bag count for Hawfinch during 2007 – 2008 and corresponding total count per decade for the 2014 survey. As already noted, the magnitudes of the bag counts and those of the mean/total counts made in the 2014 survey are not directly comparable. In fact, the two sets of values are on different scales. Therefore, in Figures 53–58, two separate y-axes are used: the bag count data is plotted on the left-side y-axis, whereas the counts from the 2014 survey are plotted on the right-side y-axis.

Overall, the highest daily counts recorded during the 2014 survey were made between late October and early November, with a decline thereafter until around 18 November, after which no more Hawfinch were recorded. The highest bag counts also occurred between late October and mid-November. Thus, the general trend observed in the bag counts for 2014 and daily counts recorded during the 2014 survey is of higher counts in the early part of the live-capturing season, up to around 18 November, with no Hawfinch being observed or caught thereafter. When the results from the present survey were compared to the 2002 – 2008 *Carnet de Chasse* data, similar temporal trends were observed, with higher counts occurring in weeks 2-3 / decade 2, corresponding to early to mid-November, followed by a steady decline until late November (week 7 / decade 6).

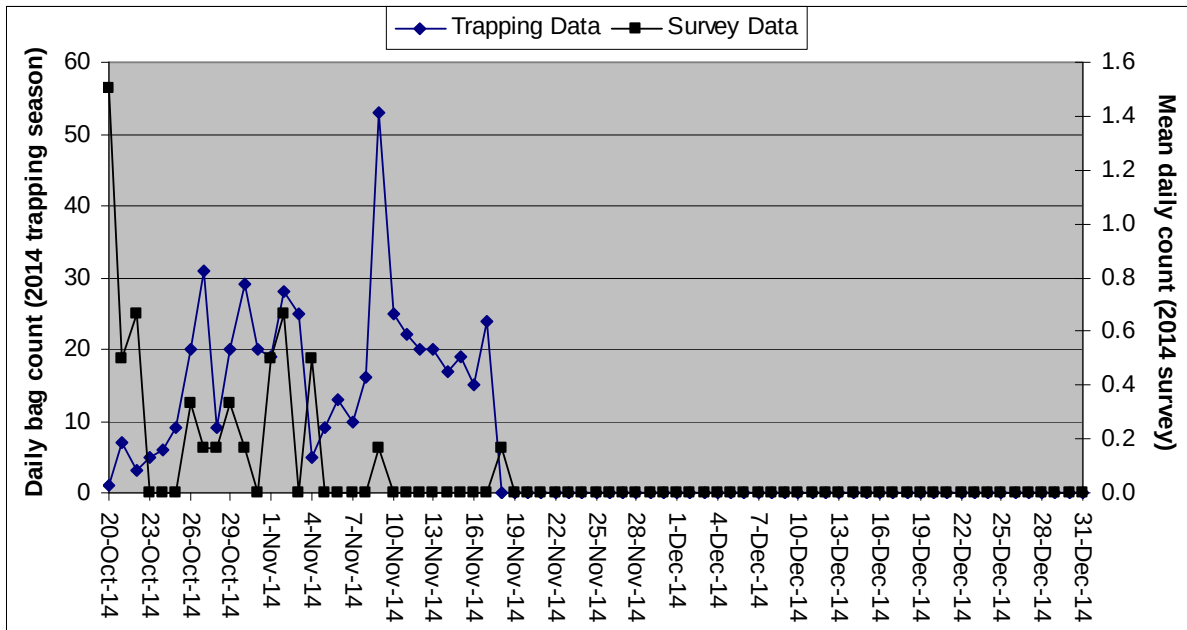


Figure 53. Daily bag count of Hawfinch during 2014 (blue line; values on left-side y-axis), together with the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

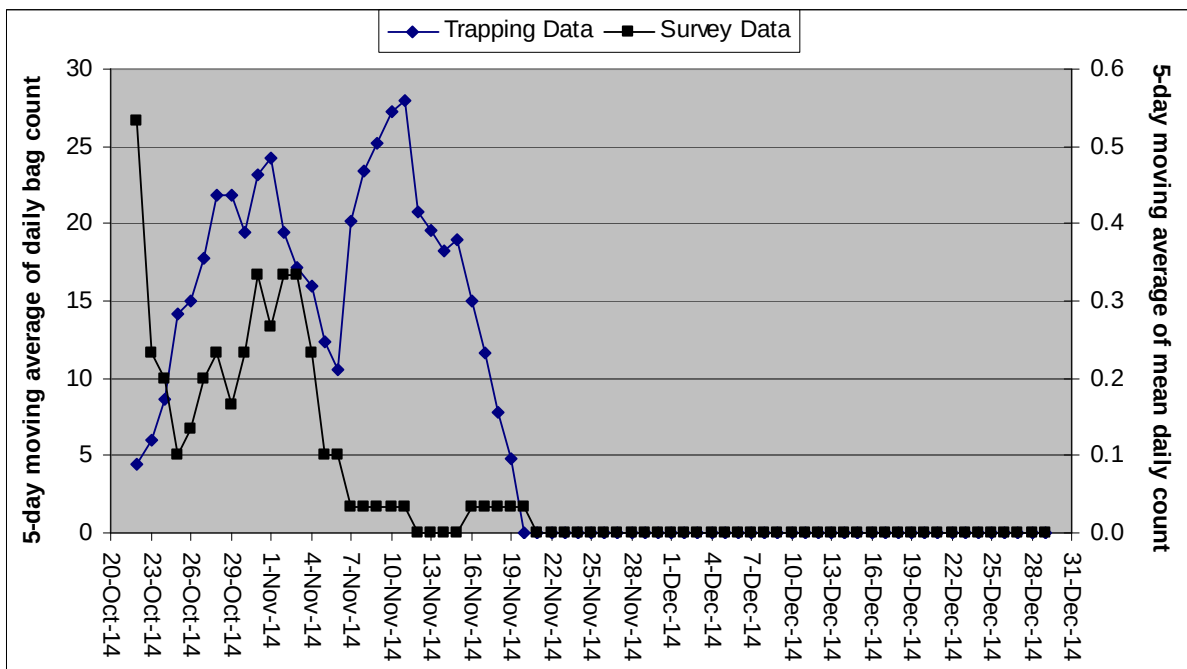


Figure 54. Moving average based on a 5-day rolling time period for the daily bag counts of Hawfinch during 2014 (blue line; values on left-side y-axis), and for the mean daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

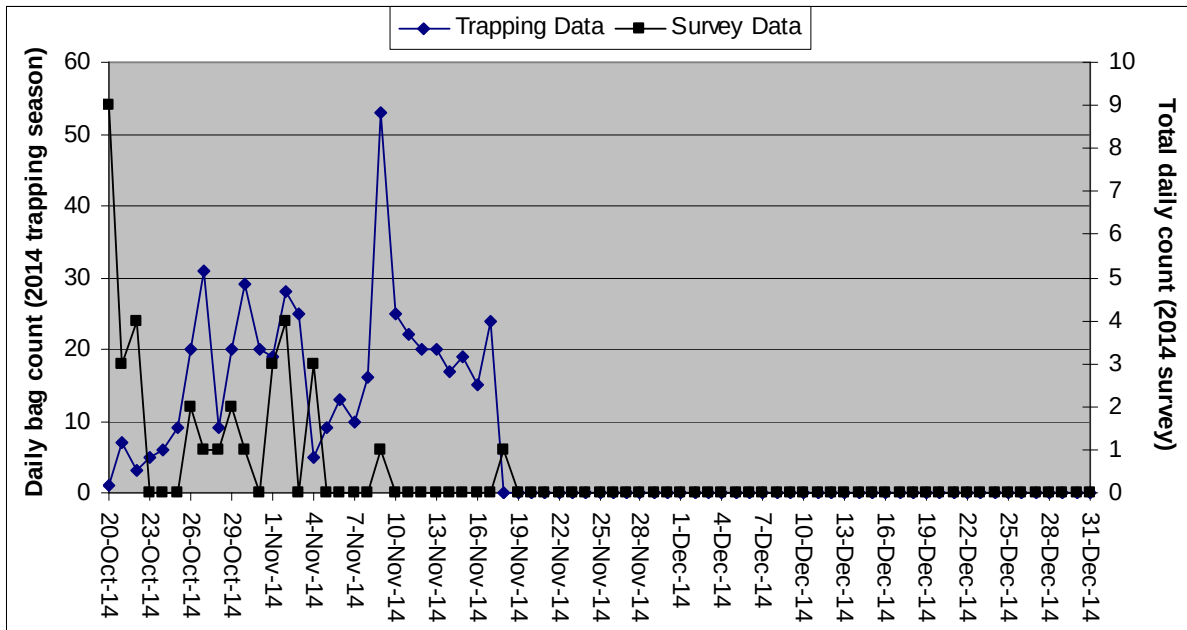


Figure 55. Daily bag count of Hawfinch during 2014 (blue line; values on left-side y-axis), together with the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

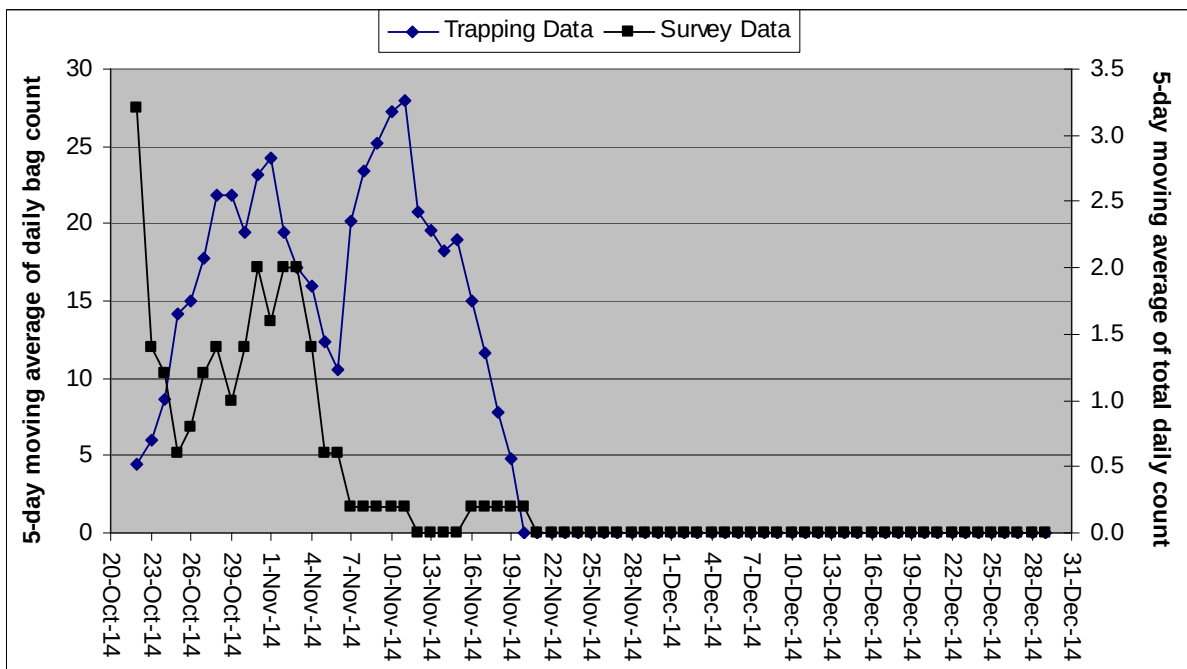


Figure 56. Moving average based on a 5-day rolling time period for the daily bag counts of Hawfinch during 2014 (blue line; values on left-side y-axis), and for the total daily counts recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

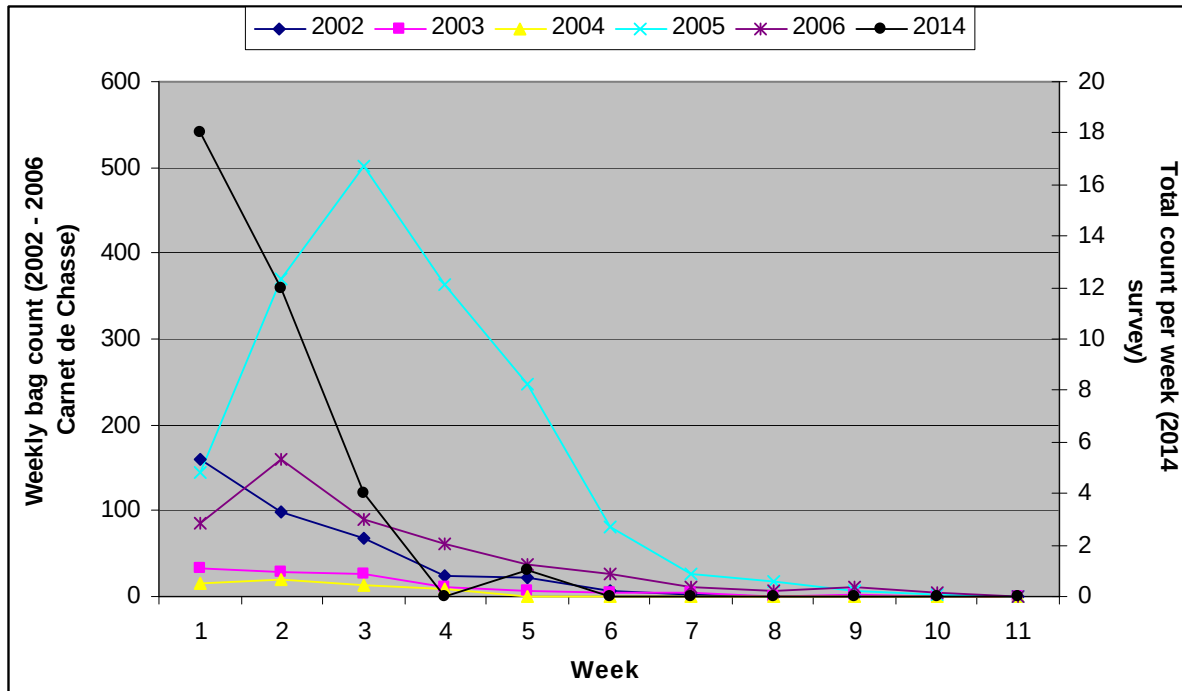


Figure 57. Weekly bag count of Hawfinch during 2002 – 2006 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per week recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

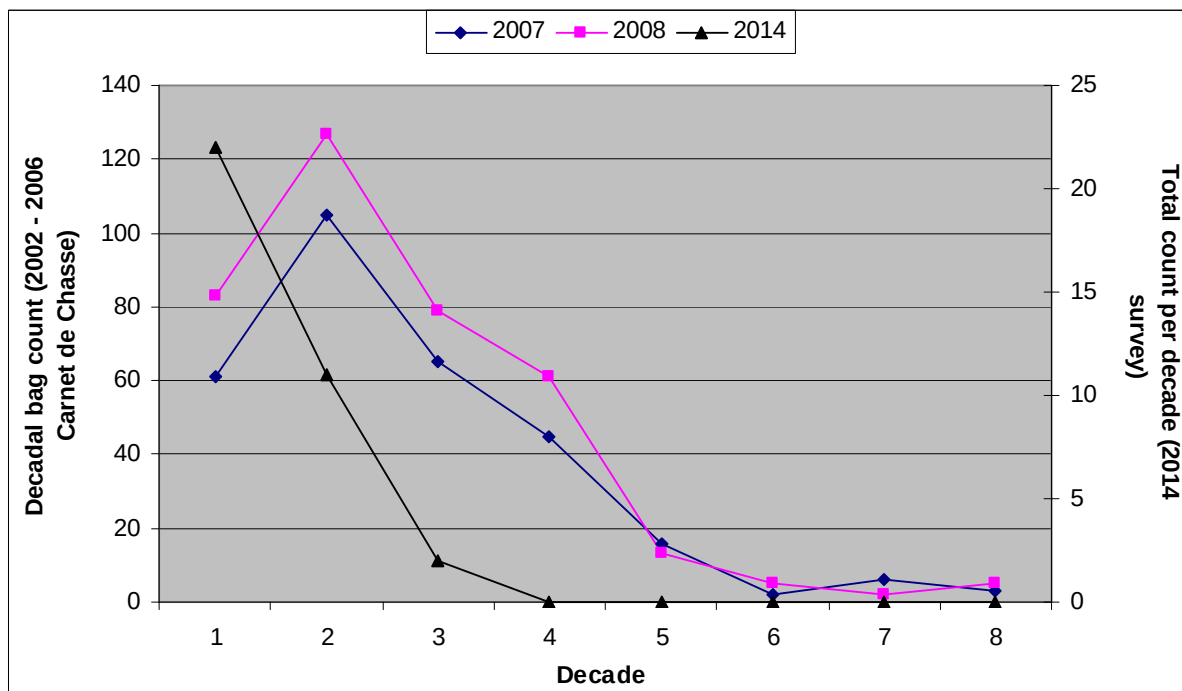


Figure 58. Decadal bag count of Hawfinch during 2007 – 2008 (coloured lines; values on left-side y-axis) extracted from *Carnet de Chasse* data, together with the total count per decade recorded during the 2014 survey (black line; values on right-side y-axis), for the period 20 October to 31 December.

5. Appraisal

The present survey provides data on mean daily counts of the seven Finch species (Linnet *Carduelis cannabina*, Chaffinch *Fringilla coelebs*, Serin *Serinus Serinus*, Goldfinch *Carduelis carduelis*, Greenfinch *Carduelis chloris*, Hawfinch *Coccothraustes coccothraustes* and Siskin *Carduelis spinus*) recorded during the study period held between 20 October and 31 December 2014, as well as estimates of the migratory influx of the seven species. Government had established the autumn/winter live-capturing season during the same period of the study.

The mean daily counts did not indicate any large migratory peaks for any of the seven species, but higher values recorded in certain periods suggest a general trend of migratory influx during the following periods: Linnet, late October to mid-November; Chaffinch, late October to mid-November; Greenfinch, November and early December; Serin, November; Hawfinch, late October. However, no discernible trend was noted in the case of Siskin and Goldfinch due to the low number of counts of individuals recorded for these two species. On the other hand, observations by the present authors indicate a high migratory influx of Hawfinch before 20 October when the present study was initiated. The raw counts for most of the species varied appreciably among the different stations. Such variation is to be expected in studies such as the present, given that birds may have a strong influx at one site and a potentially much lower one at a different site, even if the two sites are separated by a very small distance of even a few hundred meters. Considerations of habitat and land cover apply only to a degree, since birds also fly over urban and other built-up areas. Another consideration worthy of mention is the fact that some birds may also pass overhead, maintaining high altitude and avoiding landfall. The value of the figures provided in the present report therefore lies primarily in their providing a basis for future comparison, rather than in taking the counts *per se*, which in any study of this type can only be a rough estimate.

The total influx of finches for the present survey period (20 October – 31 December 2014) was estimated at 59,126 individuals for Linnet, 68,709 individuals for Chaffinch, 14,465 individuals for Greenfinch, 4,430 individuals for Siskin, 362 individuals for Goldfinch, 13,923 individuals for Serin, and 3,164 individuals for Hawfinch. No such estimates are available for previous years. It is reiterated that such estimates must be treated with utmost caution, given the relatively small number of field sites used in the survey, that counts were not made daily at each site, and since the extrapolation procedure used is likely to result in a rough estimate. Increasing the number of field sites per day is desirable since influx of birds at different localities is extremely variable, with potential large differences in number of finches passing at two different localities, even if these are separated by a very small distance, as indicated above. Furthermore, the total length of coastline surveyed per day (3 km) amounts to less than 1.5% of the total coastline; the accuracy of the estimated total migratory influx would be higher if a larger proportion of coastline is surveyed. Other limitations are (i) finch migration starts in September, and therefore finches that would have migrated before the start of the present study (i.e. before 20 October 2014) would not have been recorded; and (ii) counts were recorded over a five hour survey period, hence any individuals migrating at other times of the day were not included, leading to a potential underestimate of the total influx if significant migratory influx occurred outside the survey time on any day. Nevertheless, the stated estimate is useful when making comparison between different years, assuming data from surveys based on a similar design are available, to assess whether influx of any of the seven finch species is increasing or decreasing with time.

The design of the present survey included counts made over a 73 day period between 20 October and 31 December 2014, which covers the period when peak autumn migration of finches normally occurs.

It is reiterated that robust and rigorous assessment of migratory influx requires trend analysis based on data from monitoring carried out regularly over a sufficiently long period comprising subsequent years, and using the same methodology. For each year, the data should ideally be collected over the whole migratory season and using a larger sampling effort, for example by making counts daily at all of a minimum 21 sites. However, it should be noted that such higher sampling effort will entail very high costs, which may render the study prohibitively expensive, while it would be very difficult if not impossible to implement a survey involving daily counts at a large number of sites, given the large number of field personnel that would be required.

Nevertheless, the data from the present study provides a useful indication of the autumn influx of the seven finch species, provided that results are interpreted in the context of these limitations.

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APPENDIX I - Raw counts

Table A. Daily counts of Linnet recorded per site.

[illegible]

Ecoserv Sample Reference Code	B-059-14	B-060-14	B-061-14	B-062-14	B-063-14	B-064-14	B-065-14	B-066-14	B-067-14	B-068-14	B-069-14
16-Nov-14	6										
17-Nov-14	4	3	1	0	0	0					
18-Nov-14	2						8	0	0	0	0
19-Nov-14	0										
20-Nov-14	0										
21-Nov-14	4	4	3	0	0	1					
22-Nov-14	2						1	0	4	0	0
23-Nov-14	0										
24-Nov-14	2										
25-Nov-14	7	4	0	0	0	0					
26-Nov-14	2						0	0	0	0	0
27-Nov-14	0										
28-Nov-14	0										
29-Nov-14	0	2	0	0	0	0					
30-Nov-14	1						0	0	0	0	0
1-Dec-14	1										
2-Dec-14	3										
3-Dec-14	0	2	0	0	0	0					
4-Dec-14	0						0	0	0	0	1
5-Dec-14	0										
6-Dec-14	0										
7-Dec-14	0	0	0	0	0	0					
8-Dec-14	0						0	0	0	0	0
9-Dec-14	0										
10-Dec-14	0										
11-Dec-14	0	0	0	0	0	0					
12-Dec-14	0						4	0	0	0	2
13-Dec-14	2										
14-Dec-14	3										
15-Dec-14	0	0	0	0	0	0					
16-Dec-14	2						0	0	0	0	0
17-Dec-14	0										

Ecoserv Sample Reference Code	B-059-14	B-060-14	B-061-14	B-062-14	B-063-14	B-064-14	B-065-14	B-066-14	B-067-14	B-068-14	B-069-14
18-Dec-14	0										
19-Dec-14	0	0	0	0	0	0					
20-Dec-14	0						0	0	0	0	0
21-Dec-14	0										
22-Dec-14	0										
23-Dec-14	0	0	0	0	0	0					
24-Dec-14	0						0	0	0	0	0
25-Dec-14	0										
26-Dec-14	0										
27-Dec-14	0	0	0	0	0	0					
28-Dec-14	0						0	0	0	0	0
29-Dec-14	0										
30-Dec-14	0										
31-Dec-14	0	0	0	0	0	0					

Table A continued. Daily counts of Linnet recorded per site.

Ecoserv Sample Reference Code	B-070-14	B-071-14	B-072-14	B-073-14	B-074-14	B-075-14	B-076-14	B-077-14	B-078-14	B-079-14
Grid Location	3268	4073	5064	5872	4283	3690	3881	4070	5663	5277
20-Oct-14										
21-Oct-14										
22-Oct-14	0	0	0	0	2					
23-Oct-14						0	0	0	0	0
24-Oct-14										
25-Oct-14										
26-Oct-14	3	0	0	1	10					
27-Oct-14						0	0	0	0	0
28-Oct-14										
29-Oct-14										
30-Oct-14	7	10	0	0	1					

Ecoserv Sample Reference Code	B-070-14	B-071-14	B-072-14	B-073-14	B-074-14	B-075-14	B-076-14	B-077-14	B-078-14	B-079-14
31-Oct-14						16	1	23	0	0
1-Nov-14										
2-Nov-14										
3-Nov-14	0	4	0	0	5					
4-Nov-14						3	0	0	5	3
5-Nov-14										
6-Nov-14										
7-Nov-14	1	0	1	0	0					
8-Nov-14						2	3	0	0	0
9-Nov-14										
10-Nov-14										
11-Nov-14	0	0	0	0	0					
12-Nov-14						2	1	0	0	1
13-Nov-14										
14-Nov-14										
15-Nov-14	3	2	27	6	4					
16-Nov-14						2	2	0	0	0
17-Nov-14										
18-Nov-14										
19-Nov-14	7	0	0	0	1					
20-Nov-14						0	0	0	0	0
21-Nov-14										
22-Nov-14										
23-Nov-14	4	0	0	0	0					
24-Nov-14						3	0	0	2	0
25-Nov-14										
26-Nov-14										
27-Nov-14	0	0	0	0	0					
28-Nov-14						1	0	0	0	0
29-Nov-14										
30-Nov-14										
1-Dec-14	6	4	0	0	0					

Ecoserv Sample Reference Code	B-070-14	B-071-14	B-072-14	B-073-14	B-074-14	B-075-14	B-076-14	B-077-14	B-078-14	B-079-14
2-Dec-14						0	0	0	0	0
3-Dec-14										
4-Dec-14										
5-Dec-14	1	0	0	0	4					
6-Dec-14						2	2	0	0	0
7-Dec-14										
8-Dec-14										
9-Dec-14	2	0	0	0	1					
10-Dec-14						0	0	0	0	0
11-Dec-14										
12-Dec-14										
13-Dec-14	2	0	0	0	0					
14-Dec-14						4	0	0	0	0
15-Dec-14										
16-Dec-14										
17-Dec-14	0	0	0	0	0					
18-Dec-14						0	0	0	0	0
19-Dec-14										
20-Dec-14										
21-Dec-14	0	0	0	0	0					
22-Dec-14						3	0	0	0	0
23-Dec-14										
24-Dec-14										
25-Dec-14	0	0	0	0	0					
26-Dec-14						0	0	0	0	0
27-Dec-14										
28-Dec-14										
29-Dec-14	0	0	0	0	0					
30-Dec-14						0	0	0	0	0
31-Dec-14										

Table B. Daily counts of Chaffinch recorded per site.

Ecoserv Sample Reference Code	B-080-14	B-081-14	B-082-14	B-083-14	B-084-14	B-085-14	B-086-14	B-087-14	B-088-14	B-089-14	B-090-14
Grid Location	4085	3292	4079	4268	6067	4878	2888	4077	4666	6069	4480
20-Oct-14	5	3	6	1	3	0					
21-Oct-14	0						0	2	0	0	2
22-Oct-14	0										
23-Oct-14	0										
24-Oct-14	3	12	37	0	0	1					
25-Oct-14	0						3	3	43	0	3
26-Oct-14	3										
27-Oct-14	2										
28-Oct-14	5	4	4	7	0	0					
29-Oct-14	0						0	3	1	0	8
30-Oct-14	3										
31-Oct-14	7										
1-Nov-14	0	9	6	6	0	2					
2-Nov-14	3						39	6	15	0	4
3-Nov-14	3										
4-Nov-14	0										
5-Nov-14	4	0	3	1	0	1					
6-Nov-14	0						0	0	0	0	2
7-Nov-14	0										
8-Nov-14	0										
9-Nov-14	0	0	5	9	10	6					
10-Nov-14	0						13	3	9	0	2
11-Nov-14	2										
12-Nov-14	0										
13-Nov-14	0	0	2	0	0	2					
14-Nov-14	0						0	3	30	0	3
15-Nov-14	0										
16-Nov-14	6										
17-Nov-14	2	0	1	8	0	1					

Ecoserv Sample Reference Code	B-080-14	B-081-14	B-082-14	B-083-14	B-084-14	B-085-14	B-086-14	B-087-14	B-088-14	B-089-14	B-090-14
18-Nov-14	0						0	0	0	4	2
19-Nov-14	0										
20-Nov-14	0										
21-Nov-14	0	1	0	2	2	0					
22-Nov-14	0						1	0	4	0	2
23-Nov-14	0										
24-Nov-14	0										
25-Nov-14	0	0	0	0	0	0					
26-Nov-14	3						0	0	2	0	0
27-Nov-14	0										
28-Nov-14	0										
29-Nov-14	0	0	0	0	0	1					
30-Nov-14	0						0	1	0	0	4
1-Dec-14	0										
2-Dec-14	0										
3-Dec-14	0	1	0	0	0	0					
4-Dec-14	1						0	2	1	0	2
5-Dec-14	0										
6-Dec-14	0										
7-Dec-14	0	0	1	0	0	0					
8-Dec-14	0						0	0	0	0	0
9-Dec-14	0										
10-Dec-14	0										
11-Dec-14	0	2	1	0	0	0					
12-Dec-14	0						0	1	0	0	0
13-Dec-14	0										
14-Dec-14	0										
15-Dec-14	0	3	0	0	0	0					
16-Dec-14	0						0	0	0	0	0
17-Dec-14	4										
18-Dec-14	0										
19-Dec-14	0	2	0	0	1	0					

Ecoserv Sample Reference Code	B-080-14	B-081-14	B-082-14	B-083-14	B-084-14	B-085-14	B-086-14	B-087-14	B-088-14	B-089-14	B-090-14
20-Dec-14	0						0	0	0	0	0
21-Dec-14	0										
22-Dec-14	0										
23-Dec-14	0	0	0	0	0	0					
24-Dec-14	0						0	0	0	0	0
25-Dec-14	0										
26-Dec-14	0										
27-Dec-14	0	1	0	0	0	0					
28-Dec-14	0						0	0	0	0	0
29-Dec-14	0										
30-Dec-14	0										
31-Dec-14	0	2	0	0	0	0					

Table B continued. Daily counts of Chaffinch recorded per site.

Ecoserv Sample Reference Code	B-091-14	B-092-14	B-093-14	B-094-14	B-095-14	B-096-14	B-097-14	B-098-14	B-099-14	B-100-14
Grid Location	3268	4073	5064	5872	4283	3690	3881	4070	5663	5277
20-Oct-14										
21-Oct-14										
22-Oct-14	0	0	0	0	0					
23-Oct-14						2	2	13	0	0
24-Oct-14										
25-Oct-14										
26-Oct-14	20	0	2	36	51					
27-Oct-14						4	8	9	0	6
28-Oct-14										
29-Oct-14										
30-Oct-14	8	4	0	4	0					
31-Oct-14						10	16	23	6	0
1-Nov-14										

Ecoserv Sample Reference Code	B-091-14	B-092-14	B-093-14	B-094-14	B-095-14	B-096-14	B-097-14	B-098-14	B-099-14	B-100-14
2-Nov-14										
3-Nov-14	0	3	1	2	2					
4-Nov-14						5	2	0	0	0
5-Nov-14										
6-Nov-14										
7-Nov-14	0	0	0	0	2					
8-Nov-14						0	7	0	0	0
9-Nov-14										
10-Nov-14										
11-Nov-14	0	0	0	0	1					
12-Nov-14						1	1	0	2	0
13-Nov-14										
14-Nov-14										
15-Nov-14	1	2	0	2	3					
16-Nov-14						6	0	0	2	2
17-Nov-14										
18-Nov-14										
19-Nov-14	4	0	1	2	0					
20-Nov-14						4	2	0	2	3
21-Nov-14										
22-Nov-14										
23-Nov-14	2	0	2	0	1					
24-Nov-14						0	0	0	0	0
25-Nov-14										
26-Nov-14										
27-Nov-14	2	0	0	0	1					
28-Nov-14						0	0	0	0	0
29-Nov-14										
30-Nov-14										
1-Dec-14	0	0	3	0	0					
2-Dec-14						0	0	0	0	0
3-Dec-14										

Ecoserv Sample Reference Code	B-091-14	B-092-14	B-093-14	B-094-14	B-095-14	B-096-14	B-097-14	B-098-14	B-099-14	B-100-14
4-Dec-14										
5-Dec-14	0	0	2	0	0					
6-Dec-14						2	0	0	0	0
7-Dec-14										
8-Dec-14										
9-Dec-14	0	0	0	2	0					
10-Dec-14						0	0	0	0	0
11-Dec-14										
12-Dec-14										
13-Dec-14	1	0	0	0	0					
14-Dec-14						0	0	0	0	0
15-Dec-14										
16-Dec-14										
17-Dec-14	0	0	0	0	0					
18-Dec-14						0	0	0	0	0
19-Dec-14										
20-Dec-14										
21-Dec-14	0	0	0	0	0					
22-Dec-14						0	0	0	0	4
23-Dec-14										
24-Dec-14										
25-Dec-14	0	0	0	0	0					
26-Dec-14						0	0	0	0	0
27-Dec-14										
28-Dec-14										
29-Dec-14	0	0	0	0	0					
30-Dec-14						0	0	0	0	0
31-Dec-14										

Table C. Daily counts of Greenfinch recorded per site.

Ecoserv Sample Reference Code	B-101-14	B-102-14	B-103-14	B-104-14	B-105-14	B-106-14	B-107-14	B-108-14	B-109-14	B-110-14	B-111-14
Grid Location	4085	3292	4079	4268	6067	4878	2888	4077	4666	6069	4480
20-Oct-14	0	0	0	0	0	0					
21-Oct-14	0						0	0	0	0	0
22-Oct-14	0										
23-Oct-14	0										
24-Oct-14	0	0	0	0	0	0					
25-Oct-14	0						0	0	0	0	0
26-Oct-14	0										
27-Oct-14	0										
28-Oct-14	0	0	0	2	0	0					
29-Oct-14	0						0	0	14	0	0
30-Oct-14	0										
31-Oct-14	0										
1-Nov-14	0	6	0	0	0	0					
2-Nov-14	0						5	0	0	0	0
3-Nov-14	0										
4-Nov-14	0										
5-Nov-14	0	0	0	0	0	0					
6-Nov-14	0						0	0	0	0	0
7-Nov-14	0										
8-Nov-14	0										
9-Nov-14	2	3	3	0	0	6					
10-Nov-14	0						8	0	0	2	1
11-Nov-14	0										
12-Nov-14	0										
13-Nov-14	0	0	0	0	3	0					
14-Nov-14	0						0	2	0	3	1
15-Nov-14	2										
16-Nov-14	2										
17-Nov-14	0	0	0	0	0	0					

Ecoserv Sample Reference Code	B-101-14	B-102-14	B-103-14	B-104-14	B-105-14	B-106-14	B-107-14	B-108-14	B-109-14	B-110-14	B-111-14
18-Nov-14	0						0	0	0	0	0
19-Nov-14	0										
20-Nov-14	0										
21-Nov-14	0	0	0	0	0	0					
22-Nov-14	0						0	0	3	0	0
23-Nov-14	0										
24-Nov-14	0										
25-Nov-14	0	0	0	0	0	0					
26-Nov-14	0						0	0	0	0	0
27-Nov-14	0										
28-Nov-14	0										
29-Nov-14	0	3	0	0	0	0					
30-Nov-14	0						0	0	0	0	0
1-Dec-14	0										
2-Dec-14	0										
3-Dec-14	2	0	0	0	0	0					
4-Dec-14	0						2	0	3	0	0
5-Dec-14	0										
6-Dec-14	2										
7-Dec-14	0	0	0	0	0	2					
8-Dec-14	0						0	2	0	0	0
9-Dec-14	0										
10-Dec-14	0										
11-Dec-14	0	0	0	0	0	0					
12-Dec-14	2						0	0	0	0	1
13-Dec-14	0										
14-Dec-14	0										
15-Dec-14	0	0	0	0	0	0					
16-Dec-14	0						0	0	0	0	0
17-Dec-14	0										
18-Dec-14	1										
19-Dec-14	0	0	0	0	0	0					

Ecoserv Sample Reference Code	B-101-14	B-102-14	B-103-14	B-104-14	B-105-14	B-106-14	B-107-14	B-108-14	B-109-14	B-110-14	B-111-14
20-Dec-14	1						0	0	0	0	1
21-Dec-14	0										
22-Dec-14	0										
23-Dec-14	0	2	0	0	0	0					
24-Dec-14	0						0	0	0	0	0
25-Dec-14	0										
26-Dec-14	0										
27-Dec-14	0	0	0	0	0	0					
28-Dec-14	0						0	0	0	0	0
29-Dec-14	0										
30-Dec-14	0										
31-Dec-14	0	0	0	0	0	0					

Table C continued. Daily counts of Greenfinch recorded per site.

Ecoserv Sample Reference Code	B-112-14	B-113-14	B-114-14	B-115-14	B-116-14	B-117-14	B-118-14	B-119-14	B-120-14	B-121-14
Grid Location	3268	4073	5064	5872	4283	3690	3881	4070	5663	5277
20-Oct-14										
21-Oct-14										
22-Oct-14	0	0	0	0	0					
23-Oct-14						0	0	0	0	0
24-Oct-14										
25-Oct-14										
26-Oct-14	0	0	0	0	1					
27-Oct-14						0	0	0	0	0
28-Oct-14										
29-Oct-14										
30-Oct-14	0	3	0	0	0					
31-Oct-14						0	0	13	0	0

Ecoserv Sample Reference Code	B-112-14	B-113-14	B-114-14	B-115-14	B-116-14	B-117-14	B-118-14	B-119-14	B-120-14	B-121-14
1-Nov-14										
2-Nov-14										
3-Nov-14	0	0	0	0	0					
4-Nov-14						0	0	0	0	0
5-Nov-14										
6-Nov-14										
7-Nov-14	0	0	0	0	0					
8-Nov-14						0	0	0	0	0
9-Nov-14										
10-Nov-14										
11-Nov-14	0	0	0	0	0					
12-Nov-14						0	0	0	0	3
13-Nov-14										
14-Nov-14										
15-Nov-14	0	0	0	0	5					
16-Nov-14						1	0	5	10	0
17-Nov-14										
18-Nov-14										
19-Nov-14	3	3	0	0	1					
20-Nov-14						0	0	0	0	1
21-Nov-14										
22-Nov-14										
23-Nov-14	2	1	0	0	2					
24-Nov-14						0	1	0	0	0
25-Nov-14										
26-Nov-14										
27-Nov-14	0	4	0	0	0					
28-Nov-14						0	0	0	0	0
29-Nov-14										
30-Nov-14										
1-Dec-14	0	0	0	0	0					
2-Dec-14						0	0	0	0	0

Ecoserv Sample Reference Code	B-112-14	B-113-14	B-114-14	B-115-14	B-116-14	B-117-14	B-118-14	B-119-14	B-120-14	B-121-14
3-Dec-14										
4-Dec-14										
5-Dec-14	2	0	0	0	0					
6-Dec-14						0	0	0	0	0
7-Dec-14										
8-Dec-14										
9-Dec-14	0	0	0	0	0					
10-Dec-14						1	0	0	0	0
11-Dec-14										
12-Dec-14										
13-Dec-14	0	2	0	0	2					
14-Dec-14						0	0	0	0	0
15-Dec-14										
16-Dec-14										
17-Dec-14	0	0	0	0	0					
18-Dec-14						1	0	0	0	0
19-Dec-14										
20-Dec-14										
21-Dec-14	0	1	0	0	0					
22-Dec-14						0	0	0	0	0
23-Dec-14										
24-Dec-14										
25-Dec-14	0	0	0	0	0					
26-Dec-14						0	0	0	0	0
27-Dec-14										
28-Dec-14										
29-Dec-14	0	0	0	0	0					
30-Dec-14						0	0	0	0	0
31-Dec-14										

Table D. Daily counts of Siskin recorded per site.

Ecoserv Sample Reference Code	B-122-14	B-123-14	B-124-14	B-125-14	B-126-14	B-127-14	B-128-14	B-129-14	B-130-14	B-131-14	B-132-14
Grid Location	4085	3292	4079	4268	6067	4878	2888	4077	4666	6069	4480
20-Oct-14	0	0	0	0	0	0					
21-Oct-14	0						0	0	0	0	0
22-Oct-14	0										
23-Oct-14	0										
24-Oct-14	0	1	0	0	0	0					
25-Oct-14	0						0	0	0	0	0
26-Oct-14	0										
27-Oct-14	0										
28-Oct-14	0	0	0	0	0	0					
29-Oct-14	0						0	0	0	0	0
30-Oct-14	0										
31-Oct-14	0										
1-Nov-14	5	2	0	0	0	0					
2-Nov-14	0						22	0	6	0	0
3-Nov-14	1										
4-Nov-14	0										
5-Nov-14	0	0	0	0	0	0					
6-Nov-14	0						0	0	0	0	0
7-Nov-14	0										
8-Nov-14	0										
9-Nov-14	0	0	0	0	0	2					
10-Nov-14	0						1	0	0	0	0
11-Nov-14	0										
12-Nov-14	0										
13-Nov-14	0	0	0	0	0	0					
14-Nov-14	0						0	0	0	0	0
15-Nov-14	0										
16-Nov-14	0										
17-Nov-14	0	0	0	0	0	0					

Ecoserv Sample Reference Code	B-122-14	B-123-14	B-124-14	B-125-14	B-126-14	B-127-14	B-128-14	B-129-14	B-130-14	B-131-14	B-132-14
18-Nov-14	0						0	0	0	0	0
19-Nov-14	0										
20-Nov-14	0										
21-Nov-14	1	0	0	0	0	0					
22-Nov-14	0						0	0	0	0	0
23-Nov-14	0										
24-Nov-14	0										
25-Nov-14	0	0	0	0	0	0					
26-Nov-14	0						0	0	0	0	0
27-Nov-14	0										
28-Nov-14	0										
29-Nov-14	0	0	0	0	0	0					
30-Nov-14	0						0	0	0	0	0
1-Dec-14	0										
2-Dec-14	0										
3-Dec-14	0	0	0	0	0	0					
4-Dec-14	0						0	0	0	0	0
5-Dec-14	0										
6-Dec-14	1										
7-Dec-14	0	0	0	0	0	0					
8-Dec-14	0						0	0	0	0	0
9-Dec-14	0										
10-Dec-14	0										
11-Dec-14	0	0	0	0	0	0					
12-Dec-14	0						0	0	0	0	0
13-Dec-14	0										
14-Dec-14	0										
15-Dec-14	0	0	0	0	0	0					
16-Dec-14	0						0	0	0	0	0
17-Dec-14	0										
18-Dec-14	0										
19-Dec-14	0	0	0	0	0	0					

Ecoserv Sample Reference Code	B-122-14	B-123-14	B-124-14	B-125-14	B-126-14	B-127-14	B-128-14	B-129-14	B-130-14	B-131-14	B-132-14
20-Dec-14	0						0	0	0	0	0
21-Dec-14	0										
22-Dec-14	0										
23-Dec-14	0	0	0	0	0	0					
24-Dec-14	0						0	0	0	0	0
25-Dec-14	0										
26-Dec-14	0										
27-Dec-14	0	0	0	0	0	0					
28-Dec-14	0						0	0	0	0	0
29-Dec-14	0										
30-Dec-14	0										
31-Dec-14	0	0	0	0	0	0					

Table D continued. Daily counts of Siskin recorded per site.

Ecoserv Sample Reference Code	B-133-14	B-134-14	B-135-14	B-136-14	B-137-14	B-138-14	B-139-14	B-140-14	B-141-14	B-142-14
Grid Location	3268	4073	5064	5872	4283	3690	3881	4070	5663	5277
20-Oct-14										
21-Oct-14										
22-Oct-14	0	0	0	0	1					
23-Oct-14						0	0	0	0	0
24-Oct-14										
25-Oct-14										
26-Oct-14	0	0	0	0	0					
27-Oct-14						0	0	0	0	0
28-Oct-14										
29-Oct-14										
30-Oct-14	1	0	0	0	0					
31-Oct-14						0	2	2	0	0
1-Nov-14										

Ecoserv Sample Reference Code	B-133-14	B-134-14	B-135-14	B-136-14	B-137-14	B-138-14	B-139-14	B-140-14	B-141-14	B-142-14
2-Nov-14										
3-Nov-14	0	0	0	0	0					
4-Nov-14						0	0	0	0	0
5-Nov-14										
6-Nov-14										
7-Nov-14	0	0	0	0	0					
8-Nov-14						0	0	0	0	0
9-Nov-14										
10-Nov-14										
11-Nov-14	0	0	0	0	0					
12-Nov-14						0	0	0	0	0
13-Nov-14										
14-Nov-14										
15-Nov-14	0	0	0	0	0					
16-Nov-14						0	0	0	0	0
17-Nov-14										
18-Nov-14										
19-Nov-14	0	0	0	0	0					
20-Nov-14						0	0	0	0	0
21-Nov-14										
22-Nov-14										
23-Nov-14	0	0	0	0	0					
24-Nov-14						0	0	0	0	0
25-Nov-14										
26-Nov-14										
27-Nov-14	0	0	0	0	0					
28-Nov-14						0	0	0	0	0
29-Nov-14										
30-Nov-14										
1-Dec-14	0	0	1	0	0					
2-Dec-14						0	0	0	0	0
3-Dec-14										

Ecoserv Sample Reference Code	B-133-14	B-134-14	B-135-14	B-136-14	B-137-14	B-138-14	B-139-14	B-140-14	B-141-14	B-142-14
4-Dec-14										
5-Dec-14	0	0	0	0	0					
6-Dec-14						0	0	0	0	0
7-Dec-14										
8-Dec-14										
9-Dec-14	0	0	0	0	0					
10-Dec-14						0	0	0	0	0
11-Dec-14										
12-Dec-14										
13-Dec-14	0	0	0	0	0					
14-Dec-14						0	0	0	0	0
15-Dec-14										
16-Dec-14										
17-Dec-14	0	0	0	0	0					
18-Dec-14						0	0	0	0	0
19-Dec-14										
20-Dec-14										
21-Dec-14	0	0	0	0	0					
22-Dec-14						0	0	0	0	0
23-Dec-14										
24-Dec-14										
25-Dec-14	0	0	0	0	0					
26-Dec-14						0	0	0	0	0
27-Dec-14										
28-Dec-14										
29-Dec-14	0	0	0	0	0					
30-Dec-14						0	0	0	0	0
31-Dec-14										

Table E. Daily counts of Goldfinch recorded per site.

Ecoserv Sample Reference Code	B-143-14	B-144-14	B-145-14	B-146-14	B-147-14	B-148-14	B-149-14	B-150-14	B-151-14	B-152-14	B-153-14
Grid Location	4085	3292	4079	4268	6067	4878	2888	4077	4666	6069	4480
20-Oct-14	0	0	0	0	0	0					
21-Oct-14	0						0	0	0	0	0
22-Oct-14	0										
23-Oct-14	0										
24-Oct-14	0	0	0	0	0	0					
25-Oct-14	0						0	0	0	0	0
26-Oct-14	0										
27-Oct-14	0										
28-Oct-14	0	0	0	0	0	0					
29-Oct-14	0						0	0	0	0	0
30-Oct-14	0										
31-Oct-14	0										
1-Nov-14	0	0	0	0	0	0					
2-Nov-14	0						1	0	0	0	0
3-Nov-14	0										
4-Nov-14	0										
5-Nov-14	0	0	0	0	0	0					
6-Nov-14	0						0	0	0	0	0
7-Nov-14	0										
8-Nov-14	0										
9-Nov-14	0	0	0	0	0	0					
10-Nov-14	0						0	0	0	0	0
11-Nov-14	0										
12-Nov-14	0										
13-Nov-14	0	0	0	0	0	0					
14-Nov-14	0						0	0	0	0	0
15-Nov-14	0										
16-Nov-14	0										
17-Nov-14	0	0	0	0	0	0					

Ecoserv Sample Reference Code	B-143-14	B-144-14	B-145-14	B-146-14	B-147-14	B-148-14	B-149-14	B-150-14	B-151-14	B-152-14	B-153-14
18-Nov-14	0						0	0	0	0	0
19-Nov-14	0										
20-Nov-14	0										
21-Nov-14	0	0	0	0	0	0					
22-Nov-14	0						0	0	0	0	0
23-Nov-14	0										
24-Nov-14	0										
25-Nov-14	0	0	0	0	0	0					
26-Nov-14	0						0	0	0	0	0
27-Nov-14	0										
28-Nov-14	0										
29-Nov-14	0	0	0	0	0	0					
30-Nov-14	0						0	0	0	0	0
1-Dec-14	0										
2-Dec-14	0										
3-Dec-14	0	0	0	0	0	0					
4-Dec-14	0						0	0	0	0	0
5-Dec-14	0										
6-Dec-14	0										
7-Dec-14	0	0	0	0	0	0					
8-Dec-14	0						0	0	0	0	0
9-Dec-14	0										
10-Dec-14	0										
11-Dec-14	0	0	0	0	0	0					
12-Dec-14	0						0	0	0	0	0
13-Dec-14	0										
14-Dec-14	0										
15-Dec-14	0	0	0	0	0	0					
16-Dec-14	0						0	0	0	0	0
17-Dec-14	0										
18-Dec-14	0										
19-Dec-14	0	0	0	0	0	0					

Ecoserv Sample Reference Code	B-143-14	B-144-14	B-145-14	B-146-14	B-147-14	B-148-14	B-149-14	B-150-14	B-151-14	B-152-14	B-153-14
20-Dec-14	0						0	0	0	0	0
21-Dec-14	0										
22-Dec-14	0										
23-Dec-14	0	0	0	0	0	0					
24-Dec-14	0						0	0	0	0	0
25-Dec-14	0										
26-Dec-14	0										
27-Dec-14	0	0	0	0	0	0					
28-Dec-14	0						0	0	0	0	0
29-Dec-14	0										
30-Dec-14	0										
31-Dec-14	0	0	0	0	0	0					

Table E continued. Daily counts of Goldfinch recorded per site.

Ecoserv Sample Reference Code	B-154-14	B-155-14	B-156-14	B-157-14	B-158-14	B-159-14	B-160-14	B-161-14	B-162-14	B-163-14
Grid Location	3268	4073	5064	5872	4283	3690	3881	4070	5663	5277
20-Oct-14										
21-Oct-14										
22-Oct-14	0	0	0	0	0					
23-Oct-14						0	0	0	0	0
24-Oct-14										
25-Oct-14										
26-Oct-14	0	0	0	0	0					
27-Oct-14						0	0	0	0	0
28-Oct-14										
29-Oct-14										
30-Oct-14	0	0	0	0	0					
31-Oct-14						0	0	0	0	0
1-Nov-14										

Ecoserv Sample Reference Code	B-154-14	B-155-14	B-156-14	B-157-14	B-158-14	B-159-14	B-160-14	B-161-14	B-162-14	B-163-14
2-Nov-14										
3-Nov-14	0	0	0	0	0					
4-Nov-14						0	0	0	0	0
5-Nov-14										
6-Nov-14										
7-Nov-14	0	0	0	0	0					
8-Nov-14						0	0	0	0	0
9-Nov-14										
10-Nov-14										
11-Nov-14	0	0	0	0	0					
12-Nov-14						0	0	0	0	0
13-Nov-14										
14-Nov-14										
15-Nov-14	0	0	0	0	0					
16-Nov-14						0	0	0	0	0
17-Nov-14										
18-Nov-14										
19-Nov-14	0	0	0	0	0					
20-Nov-14						0	0	0	0	0
21-Nov-14										
22-Nov-14										
23-Nov-14	0	0	0	0	0					
24-Nov-14						0	0	0	0	0
25-Nov-14										
26-Nov-14										
27-Nov-14	0	0	0	0	0					
28-Nov-14						0	0	0	0	0
29-Nov-14										
30-Nov-14										
1-Dec-14	0	0	3	0	0					
2-Dec-14						0	0	0	0	0
3-Dec-14										

Ecoserv Sample Reference Code	B-154-14	B-155-14	B-156-14	B-157-14	B-158-14	B-159-14	B-160-14	B-161-14	B-162-14	B-163-14
4-Dec-14										
5-Dec-14	0	0	0	0	0					
6-Dec-14						0	0	0	0	0
7-Dec-14										
8-Dec-14										
9-Dec-14	0	0	0	0	0					
10-Dec-14						0	0	0	0	0
11-Dec-14										
12-Dec-14										
13-Dec-14	0	0	0	0	0					
14-Dec-14						0	0	0	0	0
15-Dec-14										
16-Dec-14										
17-Dec-14	0	0	0	0	0					
18-Dec-14						0	0	0	0	0
19-Dec-14										
20-Dec-14										
21-Dec-14	0	0	0	0	0					
22-Dec-14						0	0	0	0	0
23-Dec-14										
24-Dec-14										
25-Dec-14	0	0	0	0	0					
26-Dec-14						0	0	0	0	0
27-Dec-14										
28-Dec-14										
29-Dec-14	0	0	0	0	0					
30-Dec-14						0	0	0	0	0
31-Dec-14										

Table F. Daily counts of Serin recorded per site.

Ecoserv Sample Reference Code	B-164-14	B-165-14	B-166-14	B-167-14	B-168-14	B-169-14	B-170-14	B-171-14	B-172-14	B-173-14	B-174-14
Grid Location	4085	3292	4079	4268	6067	4878	2888	4077	4666	6069	4480
20-Oct-14	0	0	0	0	0	0					
21-Oct-14	0						0	0	0	0	0
22-Oct-14	0										
23-Oct-14	0										
24-Oct-14	0	0	0	0	0	0					
25-Oct-14	0						0	0	0	0	0
26-Oct-14	0										
27-Oct-14	0										
28-Oct-14	0	0	0	0	0	0					
29-Oct-14	0						0	0	0	0	0
30-Oct-14	0										
31-Oct-14	0										
1-Nov-14	0	0	0	0	0	0					
2-Nov-14	0						6	0	4	0	0
3-Nov-14	0										
4-Nov-14	0										
5-Nov-14	0	0	0	0	0	0					
6-Nov-14	0						0	0	0	0	0
7-Nov-14	0										
8-Nov-14	0										
9-Nov-14	0	31	3	0	0	0					
10-Nov-14	0						6	0	0	0	0
11-Nov-14	0										
12-Nov-14	0										
13-Nov-14	0	0	0	0	0	0					
14-Nov-14	0						0	0	0	0	0
15-Nov-14	0										
16-Nov-14	0										
17-Nov-14	0	0	0	0	0	0					

Ecoserv Sample Reference Code	B-164-14	B-165-14	B-166-14	B-167-14	B-168-14	B-169-14	B-170-14	B-171-14	B-172-14	B-173-14	B-174-14
18-Nov-14	0						0	0	0	0	0
19-Nov-14	0										
20-Nov-14	0										
21-Nov-14	4	0	0	4	1	0					
22-Nov-14	0						3	0	0	0	0
23-Nov-14	0										
24-Nov-14	0										
25-Nov-14	1	0	0	0	0	0					
26-Nov-14	0						0	0	0	0	0
27-Nov-14	0										
28-Nov-14	4										
29-Nov-14	0	0	0	0	0	0					
30-Nov-14	3						3	1	0	0	0
1-Dec-14	0										
2-Dec-14	0										
3-Dec-14	0	0	0	0	0	0					
4-Dec-14	2						3	0	0	0	0
5-Dec-14	0										
6-Dec-14	0										
7-Dec-14	0	0	0	0	0	0					
8-Dec-14	0						0	0	0	0	0
9-Dec-14	0										
10-Dec-14	0										
11-Dec-14	0	0	0	0	0	0					
12-Dec-14	0						0	0	0	0	0
13-Dec-14	0										
14-Dec-14	0										
15-Dec-14	0	0	0	0	0	0					
16-Dec-14	3						0	0	0	0	0
17-Dec-14	0										
18-Dec-14	0										
19-Dec-14	0	0	0	0	0	0					

Ecoserv Sample Reference Code	B-164-14	B-165-14	B-166-14	B-167-14	B-168-14	B-169-14	B-170-14	B-171-14	B-172-14	B-173-14	B-174-14
20-Dec-14	0						2	0	0	0	0
21-Dec-14	0										
22-Dec-14	0										
23-Dec-14	0	0	0	0	0	0					
24-Dec-14	2						0	0	0	0	0
25-Dec-14	1										
26-Dec-14	0										
27-Dec-14	0	1	0	0	0	0					
28-Dec-14	0						0	0	0	0	0
29-Dec-14	0										
30-Dec-14	0										
31-Dec-14	0	0	0	0	0	0					

Table F continued. Daily counts of Serin recorded per site.

Ecoserv Sample Reference Code	B-175-14	B-176-14	B-177-14	B-178-14	B-179-14	B-180-14	B-181-14	B-182-14	B-183-14	B-184-14
Grid Location	3268	4073	5064	5872	4283	3690	3881	4070	5663	5277
20-Oct-14										
21-Oct-14										
22-Oct-14	0	0	0	0	2					
23-Oct-14						0	0	0	0	0
24-Oct-14										
25-Oct-14										
26-Oct-14	0	0	0	0	0					
27-Oct-14						0	0	0	0	0
28-Oct-14										
29-Oct-14										
30-Oct-14	0	1	0	0	0					
31-Oct-14						2	0	10	0	0
1-Nov-14										

Ecoserv Sample Reference Code	B-175-14	B-176-14	B-177-14	B-178-14	B-179-14	B-180-14	B-181-14	B-182-14	B-183-14	B-184-14
2-Nov-14										
3-Nov-14	2	0	0	0	0					
4-Nov-14						0	4	0	0	2
5-Nov-14										
6-Nov-14										
7-Nov-14	0	0	0	0	0					
8-Nov-14						0	0	0	0	0
9-Nov-14										
10-Nov-14										
11-Nov-14	0	0	0	0	0					
12-Nov-14						0	2	0	0	4
13-Nov-14										
14-Nov-14										
15-Nov-14	0	0	0	0	0					
16-Nov-14						12	1	0	5	0
17-Nov-14										
18-Nov-14										
19-Nov-14	4	0	0	5	1					
20-Nov-14						0	0	0	0	0
21-Nov-14										
22-Nov-14										
23-Nov-14	0	0	0	0	0					
24-Nov-14						0	0	0	0	0
25-Nov-14										
26-Nov-14										
27-Nov-14	0	0	0	0	0					
28-Nov-14						0	0	0	0	0
29-Nov-14										
30-Nov-14										
1-Dec-14	0	0	0	0	0					
2-Dec-14						0	0	0	0	0
3-Dec-14										

Ecoserv Sample Reference Code	B-175-14	B-176-14	B-177-14	B-178-14	B-179-14	B-180-14	B-181-14	B-182-14	B-183-14	B-184-14
4-Dec-14										
5-Dec-14	0	0	0	0	0					
6-Dec-14						0	0	0	0	0
7-Dec-14										
8-Dec-14										
9-Dec-14	0	0	0	0	1					
10-Dec-14						0	0	0	0	0
11-Dec-14										
12-Dec-14										
13-Dec-14	0	0	2	0	0					
14-Dec-14						0	1	0	0	0
15-Dec-14										
16-Dec-14										
17-Dec-14	0	0	0	0	0					
18-Dec-14						0	2	0	0	0
19-Dec-14										
20-Dec-14										
21-Dec-14	0	0	0	0	1					
22-Dec-14						0	0	0	0	2
23-Dec-14										
24-Dec-14										
25-Dec-14	0	0	0	0	0					
26-Dec-14						0	0	0	0	0
27-Dec-14										
28-Dec-14										
29-Dec-14	0	0	0	0	0					
30-Dec-14						0	0	0	0	0
31-Dec-14										

Table G. Daily counts of Hawfinch recorded per site.

Ecoserv Sample Reference Code	B-185-14	B-186-14	B-187-14	B-188-14	B-189-14	B-190-14	B-191-14	B-192-14	B-193-14	B-194-14	B-195-14
Grid Location	4085	3292	4079	4268	6067	4878	2888	4077	4666	6069	4480
20-Oct-14	0	2	2	4	0	1					
21-Oct-14	0						0	0	0	0	3
22-Oct-14	0										
23-Oct-14	0										
24-Oct-14	0	0	0	0	0	0					
25-Oct-14	0						0	0	0	0	0
26-Oct-14	0										
27-Oct-14	0										
28-Oct-14	0	1	0	0	0	0					
29-Oct-14	0						0	0	0	0	2
30-Oct-14	0										
31-Oct-14	0										
1-Nov-14	0	0	1	0	1	1					
2-Nov-14	0						0	0	3	0	1
3-Nov-14	0										
4-Nov-14	0										
5-Nov-14	0	0	0	0	0	0					
6-Nov-14	0						0	0	0	0	0
7-Nov-14	0										
8-Nov-14	0										
9-Nov-14	0	0	0	0	0	1					
10-Nov-14	0						0	0	0	0	0
11-Nov-14	0										
12-Nov-14	0										
13-Nov-14	0	0	0	0	0	0					
14-Nov-14	0						0	0	0	0	0
15-Nov-14	0										
16-Nov-14	0										
17-Nov-14	0	0	0	0	0	0					

Ecoserv Sample Reference Code	B-185-14	B-186-14	B-187-14	B-188-14	B-189-14	B-190-14	B-191-14	B-192-14	B-193-14	B-194-14	B-195-14
18-Nov-14	0						0	0	0	0	1
19-Nov-14	0										
20-Nov-14	0										
21-Nov-14	0	0	0	0	0	0					
22-Nov-14	0						0	0	0	0	0
23-Nov-14	0										
24-Nov-14	0										
25-Nov-14	0	0	0	0	0	0					
26-Nov-14	0						0	0	0	0	0
27-Nov-14	0										
28-Nov-14	0										
29-Nov-14	0	0	0	0	0	0					
30-Nov-14	0						0	0	0	0	0
1-Dec-14	0										
2-Dec-14	0										
3-Dec-14	0	0	0	0	0	0					
4-Dec-14	0						0	0	0	0	0
5-Dec-14	0										
6-Dec-14	0										
7-Dec-14	0	0	0	0	0	0					
8-Dec-14	0						0	0	0	0	0
9-Dec-14	0										
10-Dec-14	0										
11-Dec-14	0	0	0	0	0	0					
12-Dec-14	0						0	0	0	0	0
13-Dec-14	0										
14-Dec-14	0										
15-Dec-14	0	0	0	0	0	0					
16-Dec-14	0						0	0	0	0	0
17-Dec-14	0										
18-Dec-14	0										
19-Dec-14	0	0	0	0	0	0					

Ecoserv Sample Reference Code	B-185-14	B-186-14	B-187-14	B-188-14	B-189-14	B-190-14	B-191-14	B-192-14	B-193-14	B-194-14	B-195-14
20-Dec-14	0						0	0	0	0	0
21-Dec-14	0										
22-Dec-14	0										
23-Dec-14	0	0	0	0	0	0					
24-Dec-14	0						0	0	0	0	0
25-Dec-14	0										
26-Dec-14	0										
27-Dec-14	0	0	0	0	0	0					
28-Dec-14	0						0	0	0	0	0
29-Dec-14	0										
30-Dec-14	0										
31-Dec-14	0	0	0	0	0	0					

Table G continued. Daily counts of Hawfinch recorded per site.

Ecoserv Sample Reference Code	B-196-14	B-197-14	B-198-14	B-199-14	B-200-14	B-201-14	B-202-14	B-203-14	B-204-14	B-205-14
Grid Location	3268	4073	5064	5872	4283	3690	3881	4070	5663	5277
20-Oct-14										
21-Oct-14										
22-Oct-14	0	0	0	0	4					
23-Oct-14						0	0	0	0	0
24-Oct-14										
25-Oct-14										
26-Oct-14	0	0	0	2	0					
27-Oct-14						0	0	0	0	1
28-Oct-14										
29-Oct-14										
30-Oct-14	0	0	1	0	0					
31-Oct-14						0	0	0	0	0
1-Nov-14										

Ecoserv Sample Reference Code	B-196-14	B-197-14	B-198-14	B-199-14	B-200-14	B-201-14	B-202-14	B-203-14	B-204-14	B-205-14
2-Nov-14										
3-Nov-14	0	0	0	0	0					
4-Nov-14						0	0	0	3	0
5-Nov-14										
6-Nov-14										
7-Nov-14	0	0	0	0	0					
8-Nov-14						0	0	0	0	0
9-Nov-14										
10-Nov-14										
11-Nov-14	0	0	0	0	0					
12-Nov-14						0	0	0	0	0
13-Nov-14										
14-Nov-14										
15-Nov-14	0	0	0	0	0					
16-Nov-14						0	0	0	0	0
17-Nov-14										
18-Nov-14										
19-Nov-14	0	0	0	0	0					
20-Nov-14						0	0	0	0	0
21-Nov-14										
22-Nov-14										
23-Nov-14	0	0	0	0	0					
24-Nov-14						0	0	0	0	0
25-Nov-14										
26-Nov-14										
27-Nov-14	0	0	0	0	0					
28-Nov-14						0	0	0	0	0
29-Nov-14										
30-Nov-14										
1-Dec-14	0	0	0	0	0					
2-Dec-14						0	0	0	0	0
3-Dec-14										

Ecoserv Sample Reference Code	B-196-14	B-197-14	B-198-14	B-199-14	B-200-14	B-201-14	B-202-14	B-203-14	B-204-14	B-205-14
4-Dec-14										
5-Dec-14	0	0	0	0	0					
6-Dec-14						0	0	0	0	0
7-Dec-14										
8-Dec-14										
9-Dec-14	0	0	0	0	0					
10-Dec-14						0	0	0	0	0
11-Dec-14										
12-Dec-14										
13-Dec-14	0	0	0	0	0					
14-Dec-14						0	0	0	0	0
15-Dec-14										
16-Dec-14										
17-Dec-14	0	0	0	0	0					
18-Dec-14						0	0	0	0	0
19-Dec-14										
20-Dec-14										
21-Dec-14	0	0	0	0	0					
22-Dec-14						0	0	0	0	0
23-Dec-14										
24-Dec-14										
25-Dec-14	0	0	0	0	0					
26-Dec-14						0	0	0	0	0
27-Dec-14										
28-Dec-14										
29-Dec-14	0	0	0	0	0					
30-Dec-14						0	0	0	0	0
31-Dec-14										