

A review of the capacity of current avian monitoring schemes in Guernsey to assess the population status of breeding and wintering bird species

Ailidh E. Barnes, David G. Noble, Graham E. Austin & Philip W. Atkinson





Research Report No.742

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Report carried out by the British Trust for Ornithology

December 2021

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Registered Charity No. 216652

British Trust for Ornithology

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Published in December 2021 by the British Trust for Ornithology
The Nunnery, Thetford, Norfolk, IP24 2PU, UK

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ISBN 978-1-912642-33-5

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1. EXECUTIVE SUMMARY

The Strategy for Nature in Guernsey (States of Guernsey 2021) delivers a clear policy driver to establish baselines for key biodiversity groups to provide government, other policy makers and practitioners the biodiversity information required for good decision making and fulfilling obligations under international agreements (e.g. Ramsar, the Convention on Migratory Species' African-Eurasian Waterbird Agreement etc.).

We summarise the different long-term avian monitoring schemes (longer than 5 years) taking place in Guernsey and Herm and, where sufficient data exists, undertake an analysis to produce trends in species breeding or wintering populations. We assess whether the monitoring schemes are sufficient to fulfil local (Bailiwick), national (UK) and international reporting requirements, and make recommendations for improving schemes. We undertake a gap analysis and identify priority species that are not covered by an existing scheme and make recommendations for setting up a program of single species surveys which fall outside current monitoring schemes.

The **BTO/JNCC/RSPB Breeding Bird Survey (BBS)** monitors the population changes of the common and widespread breeding birds in the UK, Isle of Man and Channel Islands. Species trends are calculated annually, along with composite habitat specific bird indicators such as the farmland, urban and woodland bird indicators for the UK and devolved administrations. These data, along with other datasets, are used in the assessment of the state of birds in the UK, and is also used to inform the Birds of Conservation Concern (BOCC 5), which covers the Channel Islands (Stanbury et al. 2021). Out of the 20 BBS squares on Guernsey, 112 species (68 regular or scarce breeding species and 40 non-breeders or former breeders) were recorded between 2006 and 2020 and between 2 and 15 squares were surveyed annually during this period. Smoothed long term (10 years) and short-term (5 years) trends were created for 24 species which had been recorded on average in at least 5 squares per year. Four species (Starling, Magpie, Swallow and Greenfinch) were Red listed (declines greater than 50% over these periods) and three (Collared Dove, Whitethroat plus feral Mallard) were Amber listed (25% to 50% decline). We produced four indicators: an all species indicator using the trends from all 24 bird species, a farmland, and a woodland bird indicator with 10 species each, plus an urban indicator with only 2 species; Collared Dove and House Sparrow. The species groupings used in the indicators for the UK were applied to the Guernsey data but species composition will differ for the Channel Island context. Woodland species are generally increasing whereas farmland and urban species have declined since 2008.

Consistent and sustained coverage of BBS in Guernsey is the most important recommendation and would help produce more reliable trends for these and potentially a few more species. The maximum number of squares surveyed in one year was 15 out of a possible 20 squares in 2017, but for many years the number of squares covered was fewer. Two BBS squares have only been surveyed once, and therefore will not contribute to the trend at the moment, but would do if they are surveyed again in future. Covering additional or simply all the available BBS squares would likely allow the following species to be included in the ten year trends: Buzzard, Linnet and Stock Dove; and in the five year trends: House Martin, Long-tailed Tit, Coot, Moorhen, Meadow Pipit and Shag would be included, although the latter is an anomaly of several of the squares being near the coast and Shag would be better monitored through specific seabird monitoring. The current selection of BBS squares cover c. 30% of the land area Guernsey although not all are surveyed each year. The key recommendation is to encourage volunteers to survey these squares before adding new ones. Doubling the number of squares would require much more volunteer effort and could potentially cover c. 60% of the island but would probably not add many more species that could be monitored by BBS and these scarcer, more range-limited species would be better monitored using single species surveys.

The BTO has run the year-round **Garden BirdWatch (GBW)** scheme since 1995 and thousands of people across the UK contribute their sightings, along with other garden wildlife (e.g. Hedgehogs, butterflies, damselflies and dragonflies), to the scheme each week. GBW is an entry-level scheme

aimed at volunteers who can identify common garden birds and the advantage is that volunteers are asked to report weekly, which is a big advantage over other garden wildlife recording schemes. Gardens occupy approximately a third of Guernsey's land area and are therefore an important habitat in their own right. The bar to taking part is set quite low and GBW would seem to be an ideal scheme to monitor not only this aspect of Guernsey's birds, but also other garden wildlife.

A total of 16 gardens were monitored in Guernsey across various years between 1995 to 2021. Only two gardens were sampled before 1999, an average of 5 gardens were surveyed per year between 1995-2021, and a maximum of 8 gardens were sampled in 2010 and 2021. A total of 82 bird species have been recorded using GBW gardens in Guernsey, 27 of which have been recorded in 50% or more of gardens. In terms of occupancy, Robin had the highest mean occupancy (0.89), closely followed by the Blackbird (0.88). Starling was the most abundant (mean count of 28.5), followed by the House Sparrow (mean count of 14.7). Gardens on Guernsey are not well monitored, despite large numbers of people putting out food for birds in gardens. There is potentially a large audience that could be engaged to provide information about the wildlife in their gardens. From an avian perspective, encouraging more volunteers to take part in GBW would complement data from the Breeding Bird Survey and allow additional species to be monitored in a systematic way, particularly at other times of the year. It would likely bring new volunteers into biological recording as it is an entry level scheme. These volunteers may then go on to be recruited into other schemes or allow less mobile volunteers the opportunity to take part.

BirdTrack is a semi-structured survey that is free to take part in and volunteers can record casual records or complete lists (a record of every species seen or heard during the observation period) from any location that the recorder chooses. BirdTrack records can be submitted via the mobile application or the BirdTrack website, and the sites/location are selected as points, paths or polygons on the app or website. BirdTrack has not been widely used by birdwatchers in the Bailiwick, and the highest number of users in Guernsey was only 15 individuals in 2016, with an average of 7 between 2002 and 2020. A total of 293 bird species across 81 grid references were recorded using BirdTrack between 2002 and 2020 with 148 out of the 1,599 records were submitted as complete lists between 2002-2020. Many of these were vagrants. Blackbird and Herring Gull were recorded on the highest number of grid squares (47) and Herring Gull had the highest number of observations (224). At present, with the current numbers of users and records, it is not a useful tool for monitoring. BirdTrack is, however, a much more sophisticated monitoring tool compared with the website Guernsey Birds as the latter only list sites by name with no clear geospatial definition and users can name their own sites but there is no requirement to define the boundaries of these new sites on a map.

The **Guernsey Birds** website is run by La Société Guernesaise and is similar to BirdTrack in that it is a semi-structured recording scheme solely for the Bailiwick, although the majority of records come from Guernsey. This database collects occurrences of birds and other taxa frequently recorded by birdwatchers (e.g. Odonata, Lepidoptera and marine mammals). It was set up in 2010 to allow birdwatchers to enter casual records or complete lists of their sightings. It is a community site and is a dynamic data-driven website, where people can enter their data, see recent sightings and compare sightings to those made by others. To date, approximately 250,000 records have been entered and almost 7,000 images of birds in Guernsey, Sark and Alderney have been uploaded. Since 2010, observations have been submitted under 215 usernames (a small proportion will be duplicate accounts), averaging 59 usernames per year from 2010 to 2021. Approximately 7,000 images of birds and other taxa have been uploaded by 108 users. All together, these comprise 360 birds species and subspecies) and other taxa providing a valuable resource for bringing together images of the Bailiwick's wildlife.

All sightings are documented on one of c. 700 pre-defined place names, or the user is allowed to enter their own place name. Unlike BirdTrack, they are not required to allocate a geo-referenced location to each record. With approximately 3,000 unique place names in the database we have not undertaken a formal analysis of these data and each site name would need to be georeferenced. A

total of 5,417 complete lists have been entered; these include 52,272 observations which make up 21% of all observations submitted. The highest number of lists were submitted in January and fewest in June, reflecting year listing and the pattern of bird watching activity on the islands. Guernsey Birds is excellent for recording vagrants and the less common species and potentially, if the sites are defined, reporting rates for common species could be calculated. A data clean up to correct spellings of site names and merge the different variants of spellings would facilitate any spatial analysis, along with allocating sites to locations where possible. This would require local knowledge and, moving forward, redefining the pre-defined site names so they can be more spatially explicit would be useful.

Being a group of small islands, **seabirds** are a major feature of the Bailiwick of Guernsey's avifauna. The Bailiwick's seabird colonies are significant in national terms, supporting more than 1% of the Great Britain, Isle of Man and Channel Islands population of 6 species (Storm Petrel, Northern Gannet, European Shag, Great Black-backed, Herring and Lesser Black-backed Gull) as well as internationally, supporting more than 1% of the biogeographic population of three species (Northern Gannet, European Shag and Lesser Black-backed Gull). Guernsey and Herm together only support more than 1% of the national population of European Shag. The changes in breeding numbers since 1969/1970 are relatively well understood through four national seabird censuses, although data in the JNCC database should be checked with data held locally, there may be some discrepancies. Little is known about seabird breeding success, mortality or seabirds' foraging ecology. Participation in the JNCC **Seabird Monitoring Program (SMP)** to record annually (or periodically, e.g. every 3 years) the breeding success of the Bailiwick's seabirds is recommended. This is already undertaken in Alderney and a combined Bailiwick, or Channel Island, approach would be a sensible way forward. Additional GPS tracking studies will better inform where important feeding areas are for breeding seabirds.

Little is known about the importance of the Bailiwick's waters for seabirds outside the breeding season, although during spring and autumn, counts of migrating seabirds are made on seawatches from coastal headlands by birders. These data are captured in GuernseyBirds and other online databases (e.g. Trektellen). One notable change has been the appearance, since 2014, of large rafts (up to c. 3,000) of Balearic Shearwaters off the southwest and northwest coasts of Guernsey. This globally Critically Endangered species moves out of its Mediterranean breeding areas in June and spends approximately 3 months moulting off the coasts of France. In recent years, due to increasing sea surface temperatures, the concentrations have moved north as their fish prey has shifted its distribution. At times Guernsey waters have been shown to hold 15% of the global population of this species. Being observed from shore, counts are difficult and an aerial survey of these areas using modern high-definition video or photography would vastly improve the estimate of the numbers present.

Mammalian predators (rats, cats, ferret/polecats) are present in seabird colonies. The impact of these is undocumented but will undoubtedly be having a negative effect on productivity. Eradications of rats on other islands (e.g. Lundy, St Agnes and the Shiant Islands) have shown large increases in the total number of breeding individuals and number of species breeding there. It is recommended that rat eradication or suppression programs should be scoped for the smaller islands in the Bailiwick.

The **Wetland Bird Survey (WeBS)** monitors all non-breeding waterbirds in the UK and assesses the size of non-breeding waterbird populations in the UK, trends in their numbers and distribution and the importance of individual sites for waterbirds. The Guernsey Shore WeBS site is divided into 10 individual count sectors. Since the counts inception in the winter of 1978/79, a total of 64 species of waterbird have been recorded during WeBS counts. Of these, 19 species have been recorded annually in sufficient numbers to support further detailed trend analysis for both Guernsey and the Channel Islands as a whole, and WeBS Alert status (Red, Amber or Green depending on trend). Since the baseline, Red Alerts (decline greater than 50%) have been raised for Lapwing, Grey Plover, Ringed Plover, Turnstone, Dunlin, Redshank and Black-headed Gull. Green Alerts were raised for Brent Goose, Little Egret, Cormorant, Curlew and Sanderling (all increased by more than 100%), and

Snipe (increased by 33% but less than 100%). This work has demonstrated that the pattern of recent and medium-term change has been one of decline for many species of shoreline wader, with the exception of Oystercatcher which has been stable. In most cases the declines appear to be following broader scale declines apparent across the Channel Island and following a pattern similar to that of the UK and Republic of Ireland making it unlikely that they are being driven by pressures specific to Guernsey. Turnstone may be an exception as it is declining more rapidly than the overall trend for the Channel Islands. The sector level analysis highlighted the importance of some areas within Guernsey to waders and has shown some shifts over time (e.g. declines of Dunlin at Vazon now means that the Port Grat population is the most important. Disturbance monitoring on each sector has shown significant increases in disturbance to wintering waders due to increased recreational use (e.g. walkers, dogs, etc) and the seasonal closure of important sectors to e.g. dogs would help offset this increase in disturbance.

In terms of breeding species that are not currently monitored, a gap analysis shows that certain groups and individual species fall outside of the formal systematic monitoring schemes. Of the 72 breeding species, approximately half are not covered by any monitoring scheme. These tend to be raptors/owls/scavengers (Sparrowhawk, Marsh Harrier, Buzzard, Barn Owl, Long-eared Owl, Peregrine, Raven), arguably species that should be closely monitored given the risk of persecution and poisoning, and species of woodlands (Garden Warbler, Long-tailed Tit, Firecrest, Goldcrest, Short-toed Treecreeper), wetlands (Moorhen, Coot, Cetti's Warbler, Reed Warbler), urban areas/buildings (Swift, House Martin) and coastal heaths (Stonechat, Rock Pipit, Linnet, Meadow Pipit). There are also a number of scarce/occasional breeders that will not be effectively monitored by any scheme (e.g. Sand Martin, Willow Warbler, Black Redstart, Wheatear, Grey Wagtail, Pied/White Wagtail, Cuckoo). Some of these habitats (e.g coastal heath, woodland and wetlands) could be targeted by regular surveys to provide trends on restricted range species. An annual Barn Owl box survey was started in 2022 with the aim of monitoring Guernsey's Barn Owl population.

2. INTRODUCTION

Quantifying the long-term trends in species abundance and distribution are key to understanding the impacts of environmental change on species and habitats, allow the targeting of scarce conservation resources to priority species and sites, and to quantify the impact of those interventions. Monitoring itself also accelerates conservation outcomes.

In Guernsey, the Strategy for Nature (States of Guernsey 2021) provides a clear policy driver to establish baselines for key biodiversity groups to provide government, other policy makers and practitioners the information required for good decision making and fulfilling obligations under international agreements (e.g. Ramsar, the Convention on Migratory Species' African-Eurasian Waterbird Agreement etc.). Birds are a good indicator of the state of the environment and in this review we look at the existing breeding and wintering bird monitoring schemes that have taken place on Guernsey, and together with information on the key species, sites and habitats we assess whether the existing monitoring in Guernsey is fit for purpose, and make recommendations for any improvements and additions.

Volunteer and citizen-science biological recording has a long history in the Bailiwick of Guernsey and much of what is known about the biodiversity in the islands comes from dedicated amateur naturalists. Some groups are better known than others. Birds and plants, for example, have been regularly censused as part of wider schemes encompassing Britain and Ireland through organisations such as the British Trust for Ornithology, the Botanical Society of the British Isles (BSBI). Some insect groups are monitored by Rothamsted Research, and butterflies and moths by Butterfly Conservation (BC) and its partners. Other taxonomic groups are less well known and there are large gaps in our knowledge.

Much of what is known is collected in a non-systematic and fairly ad hoc manner and, while all records are useful, there are only a few examples of where systematic baselines have been collected (e.g. the habitats survey, breeding seabird and shorebird counts etc.). Systematic baselines and continued monitoring of key groups of organisms are essential in terms of making policy and ensuring sustainable development and, as such, are an extremely valuable tool for planners. Having an islands-wide knowledge and understanding of where key biodiversity hotspots are can provide evidence to weigh up planning and development decision-making.

We review the different long-term avian monitoring schemes (more than 5 years) taking place in Guernsey and, where sufficient data exists, undertake an analysis to produce trends in species breeding or wintering populations. We assess whether they are sufficient to fulfil local, national and international requirements, and make recommendations for improving or adding species and habitat surveys and provide a framework for doing so.

3. SITES, SURVEYS AND SPECIES

In this review, we have assessed information from surveys or other data sources that collect data annually and that have been going for more than five years on the islands. We draw upon data from one local survey (records submitted to www.guernseybirds.org.gg) and five national surveys implemented locally (Breeding Bird Survey, Garden Birdwatch, Bird Track, the Seabird Monitoring Program and national seabird censuses and the Wetland Bird Survey, Figure 3.1). We have not included the information from the national Bird Atlas projects as they are c. 15-20 years apart, record data on a tetrad level (a tetrad is a square 2x2km in size) and are therefore not very useful for determining change on small spatial or temporal scales. BTO surveys are based around 1-km survey squares which use the ED_1950_UTM_Zone_30N (EPSG:23030) with a D_European_1950 datum to generate the 1-km grid.

The Channel Islands Ringing Scheme is an independent ringing scheme that covers all the Channel Islands. Data are collected and stored locally in a database. Past ringing data has been digitised and data are passed to EURING, the body that coordinates bird ringing across Europe. Data from the Channel Islands will have contributed to analyses that cover larger areas of Europe and will be used in the forthcoming Eurasian African Bird Migration Atlas project, due to be published in 2022. Most ringing in Guernsey and Herm is undertaken without a specific project in mind but there have been a number of colour-ringing projects aimed at gulls and these will be referred to in the chapters on seabirds.

The taxonomic level at which data are recorded can be different between the surveys so we have amalgamated all records to the species level and ignored subspecies. Nomenclature, breeding status and species status were taken from the Guernsey Bird Checklist 2020 (Lawlor 2021, Table 3.1). These status definitions are locally derived and are widely used and so we use these to define how common or rare a species is. Within these status definitions, those species that are feral are identified and each species is classed as a breeder, former or historic breeder or a non-breeder.

For each survey we detail the methods used to analyse the data in each of the chapters.

<i>Species status</i>	Description (after Lawlor 2021)
Vagrant	0 to 2 records in last 10 years
Very rare	3 to 5 records in last 10 years
Rare	6 to 10 records in last 10 years
Scarce	At least 11 records in last 10 years, often a few per year
Uncommon	Regularly seen every year but in relatively small numbers
Quite common	Should be seen on most visits to correct habitat at right time of year
Common	Should be seen on all visits to correct habitat at right time of year

Table 3.1. The status definitions of birds across Guernsey used throughout this report as defined by Lawlor (2021) and used locally.

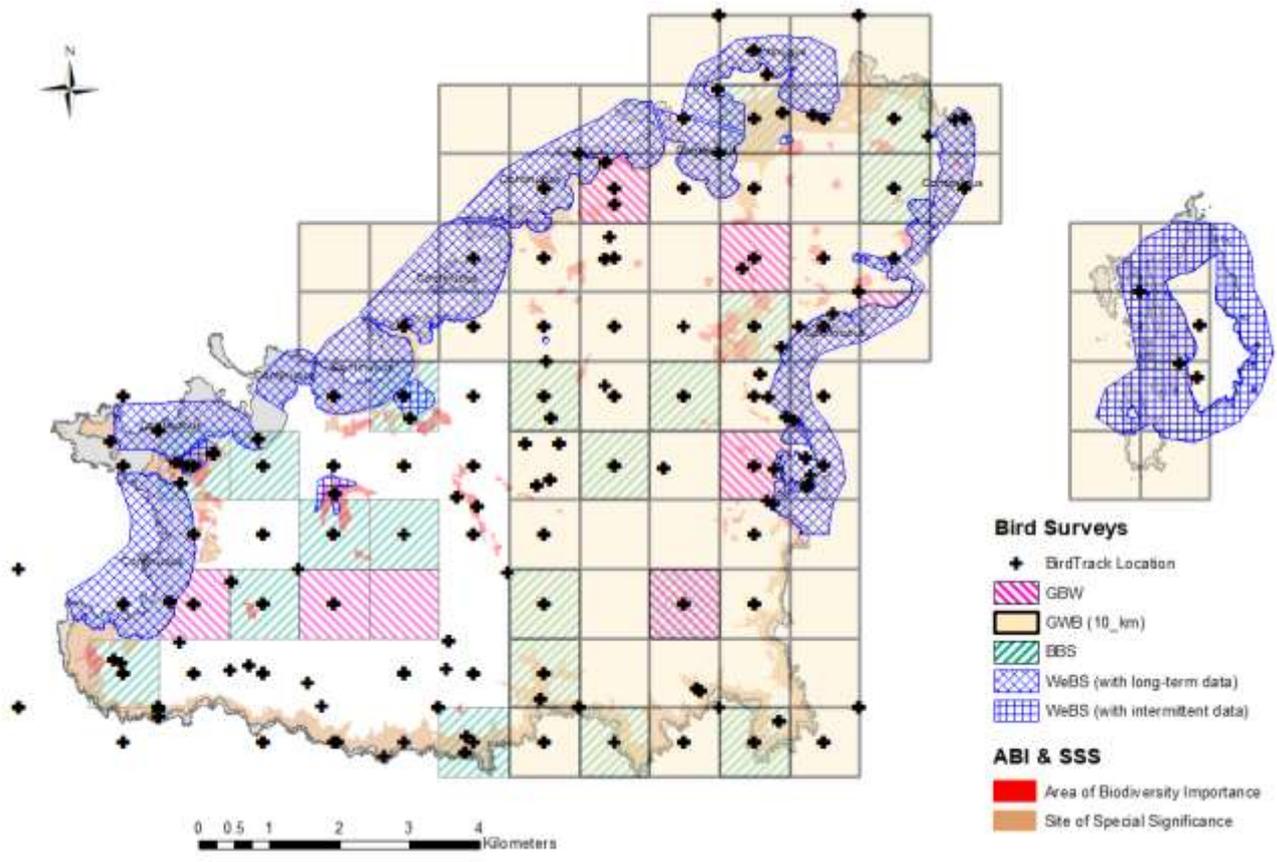


Figure 3.1. BTO surveys (BBS, BirdTrack, GBW and WeBS) coverage over Guernsey.

4. BREEDING BIRD SURVEY (BBS)

4.1 Introduction

The BTO/JNCC/RSPB Breeding Bird Survey (BBS) monitors population changes of common and widespread breeding birds in the UK, Isle of Man and Channel Islands. Based around a stratified random design of 1-km survey squares, originally allocated according to the number of volunteers available in each of 83 geographic regions, it provides a wide coverage of species and habitats. As coverage within each region increased, additional random squares were allocated within regions, to the current total of 6,718 potential BBS squares. Coverage of these by volunteers across the whole survey area has increased from 1,570 squares surveyed in 1994 to 4,005 surveyed in 2019.

BBS started in 1994 and took over from the more intensive Common Bird Census (CBC) which used territory mapping of bird species to monitor population change. Because of the intensive methods used in CBC which required 8-10 territory mapping visits to a site each year, fewer than 200 sites were covered and there was a strong bias to certain habitats such as woodlands and wetlands, and geographically a bias to southern England. The introduction of the BBS was a move designed to overcome the limitations of the CBC, which had monitored bird populations since 1962. In particular, it improves the geographical spread of bird monitoring across the UK, Isle of Man and Channel Islands, thus boosting coverage of species and of habitats.

Unlike the CBC, the BBS is far less demanding and only needs two recording visits and the focus has shifted from very intensive data collection in a small number of sites to fewer visits to a much larger number of survey squares. It has been designed to have as wide a coverage as possible and operates across all the Channel Islands, however, geographical limitations do mean that sample sizes in each island will be lower. There are benefits of having one standardised method that is comparable across all the UK & nearby Crown Dependencies but it does rely on large sample sizes. The challenge in the Channel Islands will be to ensure that there is sufficient volunteer coverage to monitor changes in the common and widespread species.

The survey protocol involves a recce visit and two early-morning spring visits annually to an allocated 1-km square. Volunteer surveyors are asked to record all birds they see or hear on two, 1-km line transects traversing the 1 km square on two visits in the breeding season (an early visit from the 1st April to mid-May and a late visit from mid-May to the end of June). The number of different bird species present in the relevant distance bands from the surveyor is recorded and this allows detectability to be accounted for. Birds are counted as being present if they are detected by sight, song or call. Other taxa such as mammals can also be recorded, including species such as rabbit, hedgehogs, etc., and butterflies can be recorded later on in the season with an additional visit to take part in the Wider Countryside Butterfly Survey (WCBS).

Species trends are calculated annually, along with composite habitat specific bird indicators such as the farmland, woodland and wetland (and soon to be published urban) bird indicators for the UK and devolved administrations. These data, along with other datasets, are used in the assessment of the state of birds in the UK, and is also used to inform the Birds of Conservation Concern (BOCC 5), which covers the Channel Islands (Stanbury et al. 2021). BOCC, commonly referred to as the UK Red List, assesses all regularly occurring species and, based on trends and other information, they are assigned into Red (species of high conservation concern) or Amber (medium concern) lists, all other species are green listed (least concern). At 70 species, the Red list, published in December 2021, is now longer than ever before, and is almost double the length of that in the first review in 1996.

In this chapter we review the BBS data available for Guernsey and determine the number of species for which we can produce trends and assess whether expansion of the scheme would allow trends to be calculated for any other additional species.

4.2 Method of Analysis

BBS data from the Channel Island region were extracted from the BBS database and filtered to contain only data from Guernsey and Herm. From this, we undertook an initial assessment of spatial and temporal coverage of survey squares and the number of species and frequency of occurrence across squares.

Individual species trends were produced following Massimino et al. (2019) for all bird species, where there were sufficient data. We used the standard summarised counts for each species in each year in each square in a log-linear regression model to produce annual population indices for species from 2008-2019. The year 2019 was chosen as a cut off due to the Covid pandemic limiting survey coverage in 2020 and 2021. Due to poor coverage of BBS squares before 2008, particularly for Kestrel, all data prior to 2008 were excluded. The total number of adult birds of each species detected in each 1-km square, i.e. summed over all distance categories and transect sections, was calculated for each year. The current BBS model takes the maximum of the two counts (early and late) as the annual measure of relative abundance. Species not recorded in a particular survey year are assigned a count value of zero. Annual population indices were calculated using a log-linear regression model with Poisson error terms. Like other monitoring projects that involve the annual surveying of a large number of sites, the BBS data includes many missing values, for example where a particular site is not surveyed every year. Counts were modelled as a function of square (site) and year effects, with interpolated estimates for site-year combinations with missing data. The model requires two points in the time series to estimate parameters, and hence 1-km squares counted in only one year are excluded. Moreover, if the data are too sparse, i.e. contain too many missing values, the model parameters cannot be estimated.

We relaxed the inclusion criteria used for the UK as a whole (presence on at least 30 squares) because of the much smaller and homogeneous area, we were therefore able to calculate trends for species which were present on average in a minimum of 5 BBS squares per year for this region to maximise the chances of producing trends that could be aggregated into indicators. The species present on average less than 10 BBS squares a year are indicated in the results, as some caution should be taken when interpreting these results.

Trends with full annual year effects (unsmoothed) and smoothed trends using a Generalised Additive Model (GAM) were both produced. To provide measures of change for each species over the longer time period (10 years), we calculated the difference in the smoothed index from 2008 to the penultimate year in the time series (2018) although all data to 2019 are used. For change over a shorter time period (5 years), we calculated the difference in the index between 2013 and 2018. Use of this time interval accords with standard protocols for reporting BBS trends.

Species also were grouped by major habitat preferences using Gibbons et al. (1993) which provided a sufficient number of species to calculate multi-species indicators comparable to the Government's Wild Bird Indicators for the UK (www.gov.uk/government/statistics/wild-bird-populations-in-the-uk). Construction of these multi-species indicators followed standard approaches, with the annual value of the indicator based on the geometric mean of constituent species annual population indices, anchored to a value of 1 in the start year (2008). Farmland, Woodland and Urban indicators were produced using 9, 10 and 2 species respectively. It is worth noting that an earlier provisional UK Urban indicator only contained four urban specialists (House Sparrow, Collared Dove, House Martin and Swift). Across the different habitats, many of the species that are included in the UK indicators do not occur in Guernsey or occur too infrequently to provide robust trends, therefore we have only included species that are present in the islands with sufficient data.

4.3 Results

4.3.1 BBS data coverage summary

A total of 41 BBS squares have been surveyed in the Channel Islands (including Jersey), and 141 species have been recorded over 27 years, 1994-2020. There are 20 BBS squares (Figure 4.2) in which data has been recorded in at least one year on Guernsey (Table 4.1), with 112 species (68 regular or scarce breeding species and 40 non-breeders or former breeders, Table 4.2) recorded between 2006 and 2020. Escapees/free roaming non-native species and vagrants not accepted by the local rarities committee were removed: Helmeted Guineafowl, Indian Peafowl, Green Woodpecker and Treecreeper. The maximum number of BBS squares covered/surveyed in one year was 15 in 2017 (Figure 4.1). Coverage of the squares varied, for example two squares (WV3075 and WV3279) have only been surveyed once over the time period and two (WV2974 and WV3383) have been surveyed almost every year (14 and 13 years consecutively out of 15) (Table 4.1). Coverage for the remaining squares has varied over the time period, with an average of nine squares being recorded each year between 2006 and 2020 (Figure 4.1 and Table 4.1).

Table 4.2a details the 68 bird species recorded in the BBS squares which were defined as breeding on Guernsey (according to Lawlor 2021) and the number of squares each species has been recorded in. Out of these 68 species 54 are said to be regularly breeding birds, with 17 regular breeders found in all 20 squares including Blackbirds, Greenfinches and House Sparrows. A total of 13 of these breeding species are scarce breeders, although Wheater and Willow Warblers were found on 12 and 10 squares respectively (Table 4.2a) and these will by and large be migrants passing through the island. The rest of these species were found on fewer than 10 squares across Guernsey. Table 4.2b details the 40 species recorded in BBS that are non-breeders on Guernsey, with only Grey Heron being found on 10 BBS squares, and the remainder were all recorded on fewer than 10 squares. Six of these non-breeding species historically bred on Guernsey, such as the Pied/White Wagtail which were found on nine BBS squares and the Turtle Dove, which has [declined nationally](#) by more than 80% in the last ten years.

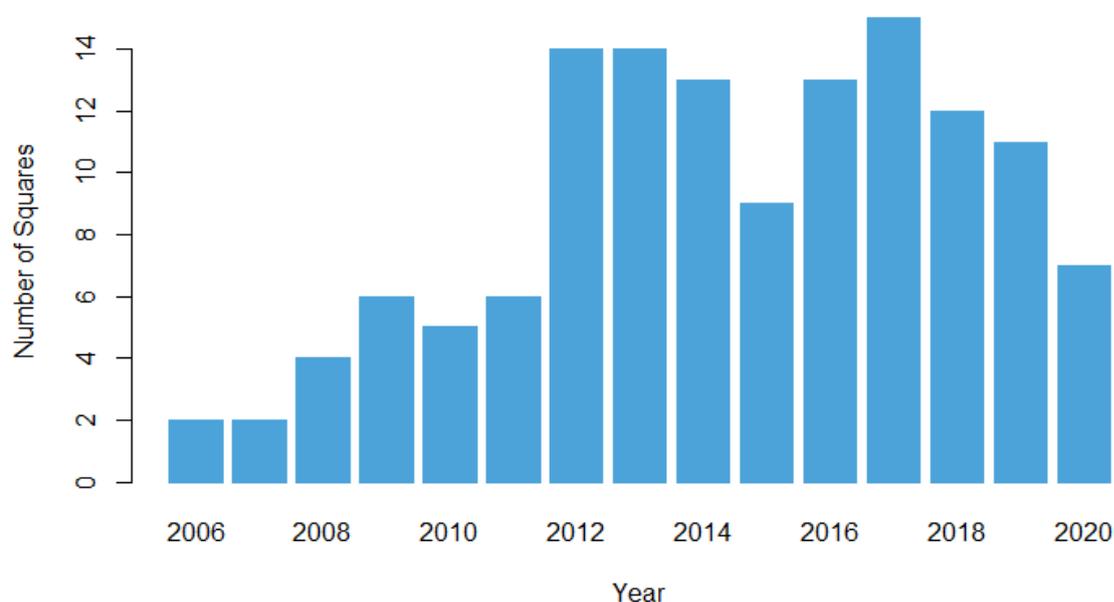


Figure 4.1 The number of Breeding Bird Survey squares surveyed each year in Guernsey.

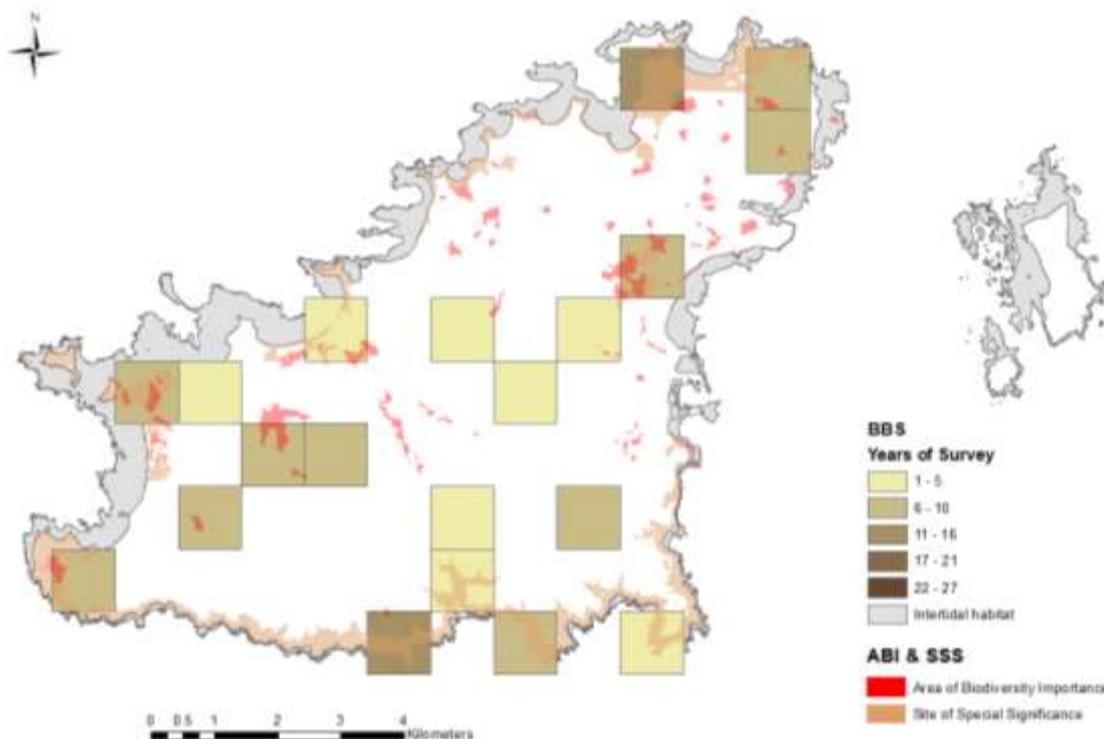


Figure 4.2 Location of the 20 BBS squares with data recorded on Guernsey, coloured by length of time surveyed.

Gridref	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
WV2475				41	43	30	32	34	35						
WV2578							37	40	36	43	40	44	45	40	
WV2676	21	18	21	20	17	20	20	20	19						
WV2678	32		26	26							33				
WV2777							38	36	35	40	39	35	35	37	29
WV2877									26	31	30	30	29	25	27
WV2879							27	22				25	24	24	
WV2974		36	31	35	29	32	32	28	31	34	40	32	33	40	28
WV3075											30				
WV3076												17	19	24	16
WV3079							25	27			19			30	
WV3174							36	33	28	33	30	30	32		
WV3178												24	24	23	
WV3276					22	26	23	25	28	27	24	27			
WV3279												24			
WV3374							31	29	26			28			
WV3380				31		33	29	34	36		37	33	33	36	30
WV3383			24	27	31	28	26	29	23	25	24	29	23	26	19
WV3582							29	29	28	32	25	25	27	28	20
WV3583							32	29	30	35	35	34	33		

Table 4.1 The spread of BBS data in the 20 1km grid squares over the period 2006-2020 (although 2006, 2007 and 2020 will not be used in further analysis), and the number of species recorded each square each year.

Status	Species	#squares	Status	Species	#squares
b	Blackbird	20	b	Meadow Pipit	10
b	Blue Tit	20	b	Sparrowhawk	10
b	Carrion Crow	20	b	Whitethroat	10
b	Chaffinch	20	sb	Willow Warbler	10
b	Chiffchaff	20	b	Oystercatcher	9
b	Collared Dove	20	b	Bullfinch	8
b	Dunnock	20	b	Moorhen	8
b	Goldfinch	20	sb	Little Egret	8
b	Great Tit	20	b	Shag	7
b	Greenfinch	20	sb	Raven	7
b	Herring Gull	20	b	Coot	6
b	House Sparrow	20	b	Marsh Harrier	6
b	Magpie	20	b	Shelduck	6
b	Robin	20	sb	Peregrine	6
b	Song Thrush	20	b	Stonechat	5
b	Woodpigeon	20	sb	Sand Martin	5
b	Wren	20	b	Fulmar	4
b	Swallow	19	b	Greylag Goose	4
b	Blackcap	18	b	Reed Warbler	4
b	Starling	18	b	Short-toed Treecreeper	4
b	Mallard	17	b	Garden Warbler	3
fb	Pheasant	17	b	Goldcrest	3
b	Stock Dove	17	sb	Little Grebe	3
b	House Martin	16	b	Firecrest	2
b	Kestrel	16	b	Great Spotted Woodpecker	2
b	Long-tailed Tit	16	b	Jackdaw	2
b	Great Black-backed Gull	15	b	Mistle Thrush	2
b	Lesser Black-backed Gull	14	b	Rock Pipit	2
b	Buzzard	13	sb	Cetti's Warbler	2
b	Swift	12	sb	Long-eared Owl	2
sb	Wheatear	12	sb	Common Tern	1
b	Feral Pigeon	11	sb	Cuckoo	1
b	Cormorant	10	sb	Grey Wagtail	1
b	Linnet	10	sb	Razorbill	1

Table 4.2a Number of breeding species (68) recorded in the BBS squares in descending order of number of squares in which the species was present (20 surveyed squares in total). Status: b = breeding species; sb = scarce breeder; fb = feral breeder (after Lawlor 2021).

Status	Species	#squares	Status	Species	#squares
	Grey Heron	10		Common Gull	1
bh	Pied/White Wagtail	9		Common Sandpiper	1
	Curlew	6		Dunlin	1
	Sedge Warbler	5		Glossy Ibis	1
	Whimbrel	5		Great Crested Grebe	1
	Black-headed Gull	4		Grey Plover	1
	Gannet	4		Hen Harrier	1
bh	Turtle Dove	4		Jack Snipe	1
	Sandwich Tern	3		Kittiwake	1
	Yellow Wagtail	3		Lapwing	1
bh	Skylark	3		Osprey	1
bh	Tufted Duck	3		Pochard	1
	Brent Goose	3		Redshank	1
	Garganey	2		Ring Ouzel	1
	Grasshopper Warbler	2		Spoonbill	1
	Shoveler	2		Tree Pipit	1
	Snipe	2		Whinchat	1
	Teal	2		Wood Warbler	1
	Bar-tailed Godwit	1	bh	Lesser Whitethroat	1
	Brambling	1	bh	Ringed Plover	1

Table 4.2b. Number of non-breeding species (40) in the BBS squares in descending order of number of squares present (20 surveyed squares in total). Status: bh = historically breeding species.

4.3.2 Bird Trends

Due to the low sample size before 2008 and pandemic-related problems with the 2020 data collection nationally, a summary of the smoothed long term (10 years) and short-term (5 years) trends was created for 24 species which were recorded on average on at least 5 squares a year or more out of the 20 squares surveyed on Guernsey between 2008-2019 (2009-2019 for Blackcap), and are displayed in Table 4.3. The colour coding indicates whether the decline is indicative of red-listing (declines >50%) or of amber listing (declines >25% and <50%). Increases in population size are also indicated in pale green for moderate increases (increases of >50% and <100%) or strong increases (increase >100%). These thresholds for decline are based on the rates used in the [Birds of Conservation Concern](#) status assessment for birds in the UK.

It is worth noting that squares which have only been surveyed once (e.g. WV3075 in 2016 and WV3279 in 2017) have not contributed to the trend, however, if those squares are surveyed at least once more in the future then they would contribute to any subsequent trend calculations.

The greatest 10 year decline was 76% in Starlings. Three more species were shown to be declining by more than 50%: the Magpie, Swallow and Greenfinch, three species have declined by between 25% and 50% and hence are coloured in orange, the Collared Dove (45%), Whitethroat (37%) and Mallard (31%) in the last 10 years on Guernsey (Table 4.3). Eleven bird species have shown little or no change, and three species have increased by more than 50%, the Great Tit, Pheasant and Oystercatcher, and the Blue Tit and Blackcap have increased by over 100%, although the trend for

Blackcap was based on 9 years of data due to none being recorded in Guernsey in 2008. Goldfinches have increased by almost 500% over the last 10 years on Guernsey. Caution should be taken when referring to these trends as they are based on very small sample sizes. The minimum requirement for national trends (UK) is 30 squares and these trends are based on less than 20 squares in total and a minimum of 5 squares on average for the 5 year trends and approx. 10 squares on average for the 10 year trend.

Compared with English 10-year BBS trends, declines of Starlings and Swallows have been more severe in Guernsey (Starling: 75% decline in Guernsey, 29% in England; Swallow 63% vs 29%), although Starlings are also red-listed in England. The Magpie population is stable in England's 10-year trend but has declined in Guernsey, and the Greenfinch is faring slightly worse in England (66% decline vs 62% in Guernsey) and is now red-listed in the UK. Blue Tits, Great Tits, Blackcaps and Goldfinches are doing better on Guernsey than across the UK and England trends ([see BBS Report 2019](#)).

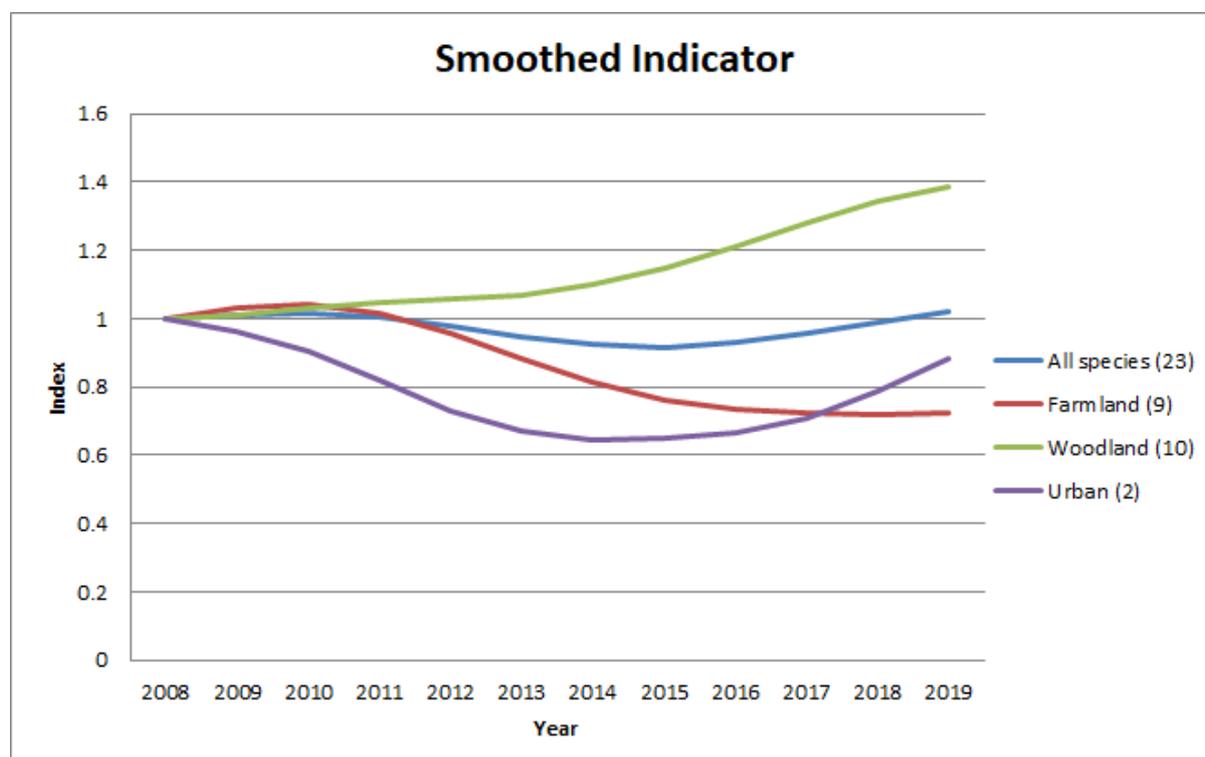
Spp Code	Habitat Association	Species	10 Year Trend (2008-2018)	5 Year Trend (2013-2018)
SG	Farmland	Starling	-75.6 (8)	-48.46 (8)
MG	Farmland	Magpie	-69.12 (10)	-41.53 (12)
SL	Farmland	Swallow	-62.78 (9)	-49.93 (11)
GR	Farmland	Greenfinch	-62.28 (10)	-28.72 (12)
CD	Urban	Collared Dove	-44.73 (7)	-26.35 (8)
WH	Farmland	Whitethroat	-37.21 (5)	-22.05 (5)
MA	Wetland	Mallard	-31.32 (8)	7.11 (10)
CH	Woodland	Chaffinch	-22.48 (10)	-4.28 (12)
K.	Farmland	Kestrel	-12.57 (6)	-15.69 (6)
B.	Woodland	Blackbird	-1.27 (10)	29.82 (12)
R.	Woodland	Robin	9.27 (10)	23.37 (12)
HS	Urban	House Sparrow	11.88 (10)	86.59 (12)
C.	Farmland	Carrion Crow	22.17 (10)	-8.99 (12)
ST	Woodland	Song Thrush	23.22 (8)	71.59 (9)
WP	Farmland	Woodpigeon	23.6 (10)	21.77 (12)
WR	Woodland	Wren	23.79 (10)	-6.04 (12)
CC	Woodland	Chiffchaff	38.26 (8)	1.41 (9)
D.	Woodland	Dunnock	44.49 (10)	40.48 (12)
GT	Woodland	Great Tit	58.54 (10)	69.22 (12)
PH	Not Included	Pheasant	76.21 (5)	137.64 (7)
OC	Generalist	Oystercatcher	81.8 (4)	21.36 (5)
BT	Woodland	Blue Tit	114.38 (8)	21.98 (10)
BC	Woodland	Blackcap	*116.47 (7)	33.39 (8)
GO	Farmland	Goldfinch	497.64 (9)	101.51 (11)

Table 4.3 BBS trend for the 24 most common bird species (in at least one square each year) in Guernsey from **2008-2019**. Sample size (number of squares) is in brackets. Severe declines over 10 years of >50% are highlighted in red, moderate declines (>25%) in orange, increases of >50% are in light green and increases >100% are dark green. The habitat association is based on Gibbons et al. (1993) and states which species contribute to the relevant indicator (N.B. Oystercatcher and Mallard only contribute to the all species indicator). *Blackcap is the 9 year trend as the trend was calculated for 2009-2019.

4.3.3 Bird Indicators

We were able to produce four indicators: an all species indicator using the trends from all 24 bird species in Table 4.3, a farmland and a woodland bird indicator with 9 and 10 species respectively (see Table 4.3), and an urban indicator with only 2 species; Collared Dove and House Sparrow. It is worth noting that the newly created urban indicator for the UK only contains four species (including, additionally, Swift and House Martin). Pheasant is not included in the indicators as it is non-native and population densities are artificially increased by releases. Oystercatcher and Mallard were both included in the all species indicator, but not in habitat specific indicators as we would not report a single species indicator for coastal and wetland respectively.

The all species indicator is relatively stable (smoothed and unsmoothed trends in Figure 4.3). Contrary to both the [UK](#) and [England](#) woodland indicators, the woodland indicator for Guernsey is increasing presumably as a result of the increase in woodland cover over the island since the Second World War. The farmland bird indicator, on the other hand, is decreasing, in line with the UK and England, most likely as an ongoing consequence of agricultural intensification. Interestingly, the urban indicator is increasing, presumably due to the greater urban coverage across the island, and may be mostly driven by the increase in House Sparrows in the last 5 years (see Table 4.3).



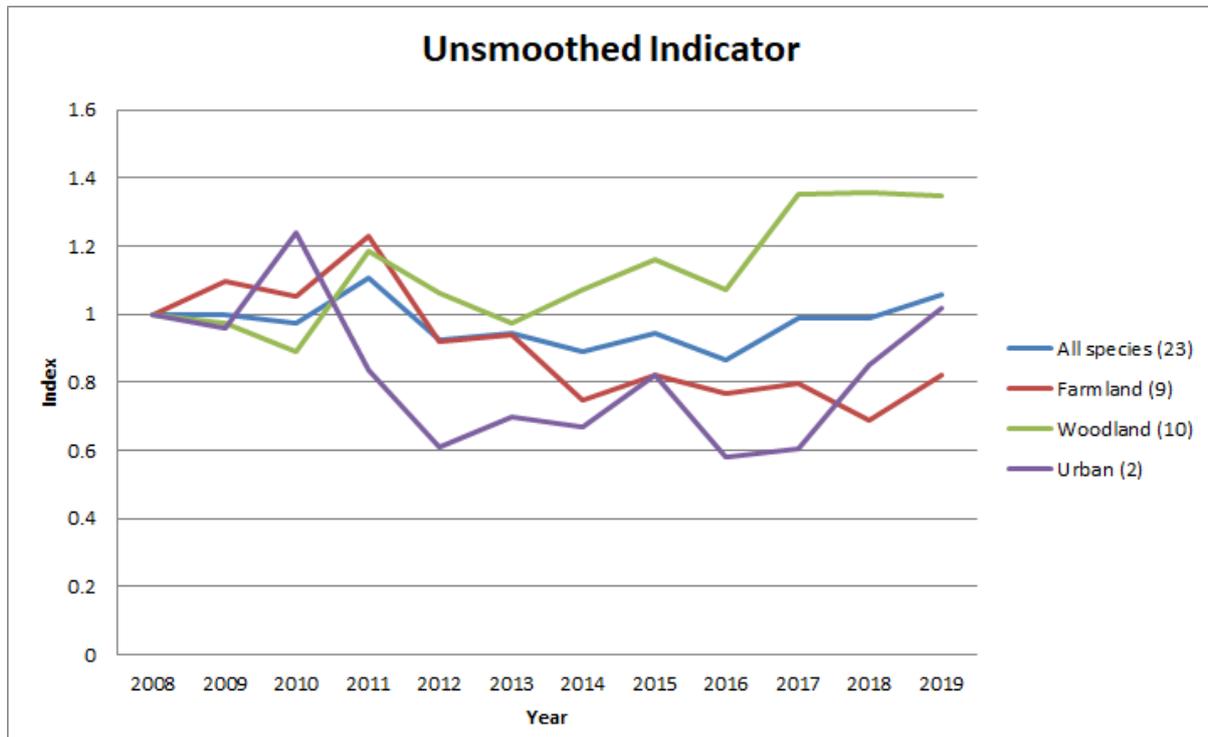


Figure 4.3 The smoothed and unsmoothed indicators using the bird trends produced from the BBS data. Number of species used in each indicator is in brackets and the species contributing to each indicator is detailed in Table 4.3.

4.4 Recommendations/Discussion

It is encouraging that annual breeding bird trends can be produced for 24 species using the Breeding Bird Survey methodology and leading on from that, the three habitat specific bird indicators. The species used in these indicators are comparable with the UK indicators, however, some species are not used or have been removed as they do not occur on Guernsey. For example Oystercatchers are classed as generalists in Gibbons *et al.* as many breed inland on farmland, but are strictly coastal in Guernsey. We therefore do not include them in a habitat specific breeding bird indicator, but are included in the all species indicator, whereas Pheasants are non-natives and are therefore not included in the indicators.

The decline in Starlings follows the UK and England trends, but at a greater rate, suggesting that the decline is more pronounced in Guernsey. The declines in Swallows and Greenfinch also follow those over the UK, with *Trichomonosis* disease affecting the Greenfinch and more recently the Chaffinch in the UK and Europe (Lawson *et al.* 2011), suggesting increased feeder cleaning in gardens is required. Rather unexpectedly, Magpies have declined by a greater degree than both the UK and England trends, which appear to be stable. This is unusual but the suggestion of persecution across the island could be impacting the local Magpie population.

One easy win in terms of increasing sample size, would be to continue to survey the two BBS squares that have only been surveyed once, and therefore do not currently contribute to the trend analysis at the moment. Once they are surveyed again, they would start contributing to the future trend analysis.

The key recommendation of this assessment of BBS would be to encourage a consistent and sustained coverage of BBS squares across Guernsey as the maximum number of squares surveyed in one year was 15 in 2017 out of a possible 20 squares. Having a larger sample size of squares each year would increase the number of species that could be reported on for the 5 year trend. How many squares to add is up for debate; adding a few more BBS squares may increase coverage,

however, doubling may not be necessary or feasible as there is not a great deal of free space to keep the location of the BBS squares random. Guernsey is only around 65km², therefore doubling the BBS squares to 40 would cover the majority of the island, and would mean that some of the squares would not contribute to the UK BBS scheme, although of course they would be relevant locally. For a relatively small island, a coverage of 20 BBS squares would be considered adequate to produce trends for the widespread and common species. We would advise that the same observer covers each square each year. However, if this is unachievable, anyone visiting that square (e.g. visitors to the island) could survey it if there is a lack of motivation and/or shortage of volunteers and once visit is much better than none. Guernsey is well covered for the size of the island, therefore increasing the coverage of existing squares by local volunteers would be the best option. A third visit in the same season could boost data collection and coverage, however, if the motivation is lacking for volunteers already, this may be the less viable option.

Some species are just below the cut off point in terms of being able to produce trends. If the number of squares surveyed each year was increased to the whole 20 squares (or as many as possible) per year, depending on the numbers of each species recorded in the new squares, the following species could be included in the ten year trends: Buzzard, Linnet and Stock Dove and in the five year trends: House Martin, Long-tailed Tit, Coot, Moorhen, Meadow Pipit and Shag could be included, although the latter would be better monitored through specific Seabird monitoring. A trend for Feral Pigeon could also be calculated, depending on the need for monitoring this species across Guernsey.

5. GARDEN BIRDWATCH (GBW)

5.1 Introduction

The BTO has run the year-round Garden BirdWatch (GBW) scheme since 1995 and thousands of people across the UK contribute their sightings to the scheme each week. GBW is an entry-level scheme aimed at volunteers who can identify common garden birds. Gardens occupy approximately a third of Guernsey's land area and are therefore an important habitat in their own right. The bar to taking part is set quite low and GBW would seem to be an ideal scheme to monitor this aspect of Guernsey's birds. It also introduces people into the concept of biological recording and encourages wildlife friendly gardening and good bird feeding hygiene practices. Volunteers normally pay an annual fee of £17 to take part and would receive a copy of the 220-page '*Garden Birds and Other Wildlife*' book (Risely and Simm, 2016) which helps volunteers identify and learn more about garden wildlife, a magazine *Bird Table* delivered four times a year, access to expert advice from the BTO and a regular e-newsletter with information on recording and identifying garden wildlife, and news from the GBW community. At the moment GBW is free to take part due to the pandemic and has allowed people to monitor birds in their garden; they still receive an e-newsletter, but not the bird guide.

From 2003, participants have been able to record other taxonomic groups, including mammals, amphibians, reptiles, butterflies, bumblebees and, more recently, dragonflies. Along with the bird survey, once each week, Garden BirdWatchers are asked to record the features in their gardens and the food they provide the birds, and they can also report incidences of sick or dead wildlife. A high take up of the scheme in the UK allows reporting rates of individual species to be calculated. These provide a fascinating insight into how birds use gardens throughout the year as well as providing a mechanism to calculate change over longer time periods. This data allows (i) analysis of the birds using our gardens, (ii) the targeted surveys for species such as House Sparrows and wintering Blackcaps, and (iii) is also used to monitor wildlife diseases such as *Trichomonosis* a protozoan parasite that has decimated finch populations in the UK. This has evolved into Garden Wildlife Health (<https://www.gardenwildlifehealth.org/>), a portal where dead and diseased animals found in gardens can be reported.

The timing of the observation period within each week and its duration is left to the discretion of the observer, but should be consistent from week to week, i.e. survey effort varies between sites but not over time within sites. Volunteers record the weekly presence (or absence) of common species seen in their garden.

5.2 Method of Analysis

GBW data was extracted from BTO's database and checked and filtered to only contain information for Guernsey. From this, we undertook an initial assessment of spatial and temporal coverage of survey gardens and the number of species and frequency of occurrence across gardens. For each garden the total number of submissions, total number of years in which data were recorded, and total and mean species richness were calculated. For each bird species, the number of gardens each species was recorded in, the proportion of gardens (out of a total of 16), the total number of years the species was recorded in, the mean occupancy and mean abundance across all gardens were calculated in R (version 4.0.3). Mean occupancy was calculated from the number of weeks the species was recorded in a particular year divided by the number of weeks monitored in that year.

Further analyses, such as estimating trends over years or seasonal patterns of occurrence, were not carried out as the number of gardens was small and gardens with fewer records across the season would have to be dropped from seasonal comparisons. Work is underway within the broader Garden BirdWatch work programme to develop methods for extracting annual trends, focusing on two time periods (breeding season and mid-winter). Once completed and tested at smaller region levels,

these might be applied to the Guernsey dataset but are likely to require considerably more gardens than currently, for example in the order of at least 50-100.

5.3 Results

5.3.1 Summary of GBW data coverage

A total of 22 gardens and observers have participated in GBW across all the Channel Islands between 1995-2021. The majority of these were in Guernsey where 16 gardens were monitored in various years between 1995 to 2021 (Table 5.1). The exact location of these are recorded either at the 1km or 10km grid square level. Fourteen gardens were located in ten 1-km squares and two gardens were located at the 10km square level (Figure 5.1).

Only two gardens were sampled before 1999 (Table 5.1), an average of 5 gardens were surveyed per year between 1995-2021, and a maximum of 8 gardens were sampled in 2010 and 2021 (Figure 5.2). Table 5.1 and Table 5.2 show that a number of gardens only had a handful of submissions in a few years, whereas two particular gardens (GBW No.'s 62743 and 5531) were sampled over the majority of the time period. Table 5.2 also shows that the greatest species richness was 54 (in GBW No. 82943), although the highest mean species richness across years was 35.5 (in GBW No. 12810), however, this is because this garden was only surveyed in the two most recent years (Table 5.1).

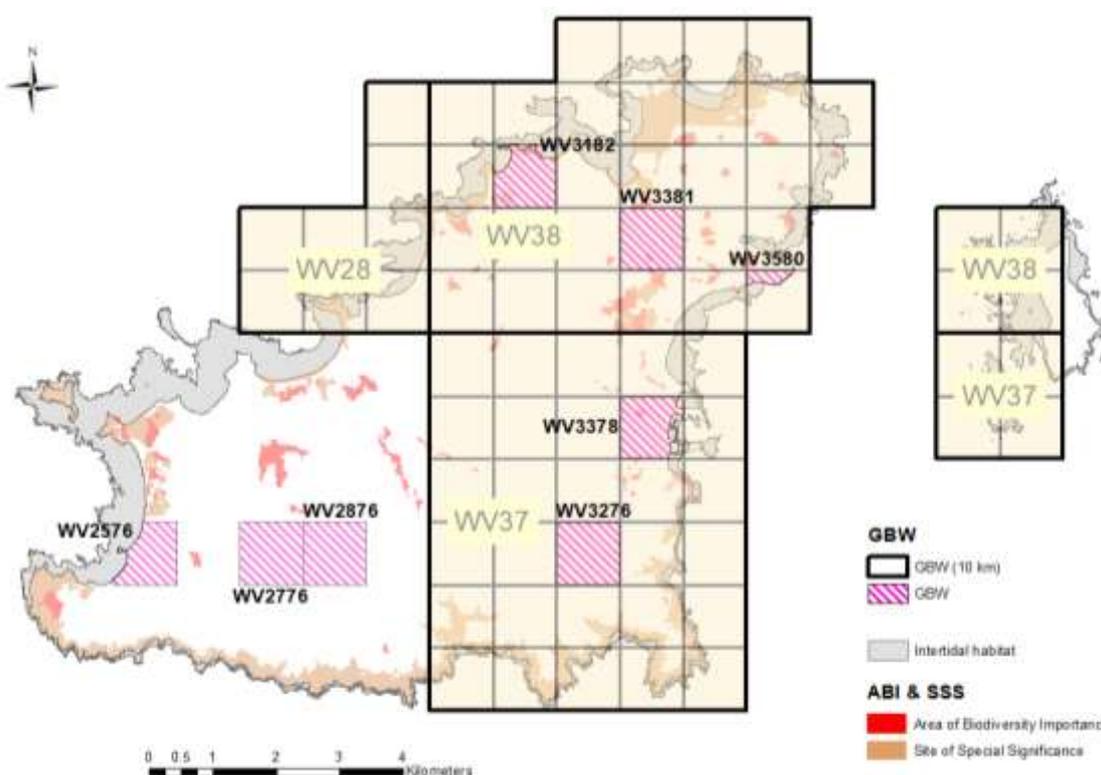


Figure 5.1 GBW coverage across Guernsey. Location data is 1km (red striped) or 10km (beige) squares.

GBW No.	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21
5531	14	17	16	14	15	14	14	12	15	15	18	18	18	17	18	18	19	16	16	15	14	16	14	17	15	16	14
5712	13	14	16	16	16	16	17																				
12810																										37	34
26290																							8	12	14	12	11
62743					17	23	26	24	23	23	24	22	28	25	23	23	25	22	23	19	21	21	20	22	20	18	20
71891							12	19	15																		
76562								25	22	24	28	35	28	31	29	30	32	32	30	33	35	30	36	35	33	30	
78263								10	19	22	24	36	23	30													
80910										17	21	21	21	17	21	23	20	18	16								
82943														31	37	25	25	30	30	30	30	31	34	30	29	26	
87023													10	17	9					7	15	16	18	20	19	13	
88078																20											
94142								12	32																		
95122										18																	
97467																18	24										
111265																											19

Table 5.1 Yearly GBW coverage from 1995 to 2021 in the gardens across Guernsey with the number of bird species recorded each year.

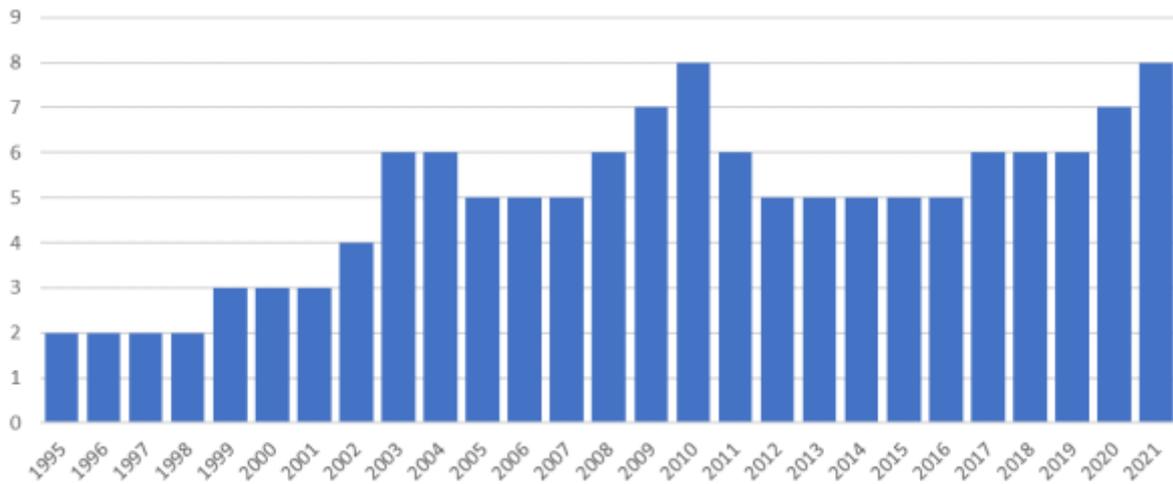


Figure 5.2. The number of GBW gardens that submitted bird records in each year.

GBW Number	GridRef	No. of Submissions	No. of Years	Total Species Richness	Mean Species Richness
5531	WV38	1310	27	27	15.7 (13.3 - 18.3)
5712	WV38	262	7	21	15.4 (13.1 - 16.9)
12810	WV2576	82	2	39	35.5 (34.1 - 36.9)
26290	WV3378	189	5	15	11.4 (8.3 - 13.8)
62743	WV38	1015	23	41	22.3 (17.6 - 26.9)
71891	WV28	128	3	20	15.3 (12.1 - 18.8)
76562	WV3276	889	19	51	30.4 (22.9 - 35.5)
78263	WV3580	284	7	42	23.4 (11.3 - 35.1)
80910	WV3276	422	10	32	19.5 (16.2 - 22.6)
82943	WV3381	630	13	54	29.8 (25.0 - 36.1)
87023	WV3182	371	10	27	14.4 (7.4 - 19.8)
88078	WV2876	14	1	20	20.0 (20.0 - 20.0)
94142	WV38	42	2	33	22.0 (12.5 - 31.5)
95122	WV37	3	1	18	18.0 (18.0 - 18.0)
97467	WV3580	6	2	24	21.0 (18.1 - 23.9)
111265	WV3381	13	1	19	19.0 (19.0 - 19.0)

Table 5.2 Site summary for each GBW garden in Guernsey with total species richness from 1995 to 2021 and mean species richness across years.

5.3.2 GBW Species Summary

A total of 82 bird species have been recorded across the 16 GBW gardens in Guernsey (Table 5.3). Ten species were found in all 16 gardens and 22 species only recorded in a single garden (Table 5.3), as a result of either not being a garden bird, for example Yellowhammer are farmland birds, or being rare (e.g. Yellow-browed Warbler). GBW is an entry level scheme and mistakes in identification will inevitably occur, but these are likely to be low for common easily recognisable species. For example, four species which do not occur (or are vagrants) in Guernsey were also recorded (Marsh/Willow Tit, Nuthatch, Tawny Owl and Tree Sparrow) and these are not shown in Table 5.3.

In terms of occupancy, Robin had the highest mean occupancy (0.89), closely followed by the Blackbird (0.88). Starling was the most abundant (mean count of 28.5), followed by the House Sparrow (mean count of 14.7).

Species	No of sites	No of years	Mean occupancy	Mean abundance per year
Magpie	16	27	0.6245 (0.0000 - 1.0000)	5.5 (0.0 - 15.7)
Blue Tit	16	27	0.6561 (0.0000 - 1.0000)	3.2 (0.0 - 7.0)
Great Tit	16	27	0.6936 (0.0822 - 1.0000)	3.7 (0.3 - 7.7)
Wren	16	27	0.4080 (0.0000 - 1.0000)	1.4 (0.0 - 3.7)
Blackbird	16	27	0.8843 (0.2901 - 1.0000)	6.9 (1.3 - 15.3)
Robin	16	27	0.8913 (0.5935 - 1.0000)	2.7 (1.0 - 5.0)
House Sparrow	16	27	0.8347 (0.0626 - 1.0000)	14.7 (0.3 - 50.0)
Dunnock	16	27	0.8181 (0.1172 - 1.0000)	3.4 (1.0 - 6.0)
Greenfinch	16	27	0.5434 (0.0000 - 1.0000)	5.1 (0.0 - 18.0)
Goldfinch	16	27	0.4579 (0.0000 - 1.0000)	7.3 (0.0 - 19.3)
Woodpigeon	15	23	0.5946 (0.0000 - 1.0000)	5.7 (0.0 - 20.4)
Collared Dove	15	27	0.5954 (0.0000 - 1.0000)	5.6 (0.0 - 26.7)

Long-tailed Tit	15	22	0.1571 (0.0000 - 0.6038)	7.7 (0.0 - 30.0)
Song Thrush	15	27	0.3340 (0.0000 - 0.9410)	2.2 (0.0 - 7.0)
Chaffinch	15	27	0.5288 (0.0000 - 1.0000)	9.7 (0.0 - 22.0)
Carrion Crow	14	21	0.4795 (0.0000 - 1.0000)	4.1 (0.0 - 10.7)
Starling	14	27	0.4926 (0.0000 - 1.0000)	28.5 (0.0 - 167.5)
Blackcap	12	27	0.1133 (0.0000 - 0.4307)	1.3 (0.0 - 4.7)
Herring Gull	11	19	0.2011 (0.0000 - 1.0000)	7.0 (0.0 - 19.7)
Sparrowhawk	10	24	0.0837 (0.0000 - 0.5273)	0.6 (0.0 - 1.0)
Chiffchaff	9	18	0.0265 (0.0000 - 0.1865)	0.7 (0.0 - 3.0)
Goldcrest	9	22	0.0584 (0.0000 - 0.5731)	1.1 (0.0 - 5.0)
Redwing	9	22	0.0426 (0.0000 - 0.2641)	5.5 (0.0 - 29.0)
Mallard	8	17	0.0853 (0.0000 - 0.8280)	2.8 (0.0 - 14.7)
Kestrel	8	17	0.0310 (0.0000 - 0.4162)	0.7 (0.0 - 2.7)
Swallow	8	18	0.0361 (0.0000 - 0.3077)	6.4 (0.0 - 30.0)
Pied/White Wagtail	8	18	0.0095 (0.0000 - 0.0814)	0.3 (0.0 - 3.3)
Bullfinch	7	19	0.0686 (0.0000 - 0.8198)	1.1 (0.0 - 5.0)
Feral Pigeon	6	27	0.2537 (0.0000 - 1.0000)	1.7 (0.0 - 21.0)
Pheasant	5	13	0.0623 (0.0000 - 0.9169)	1.1 (0.0 - 8.7)
Stock Dove	5	14	0.1362 (0.0000 - 0.9943)	5.8 (0.0 - 35.4)
Fieldfare	5	12	0.0133 (0.0000 - 0.0718)	0.3 (0.0 - 2.0)
Great Black-backed Gull	4	6	0.0024 (0.0000 - 0.0285)	0.1 (0.0 - 1.0)
Grey Heron	4	11	0.0087 (0.0000 - 0.1146)	0.3 (0.0 - 1.0)
Buzzard	4	8	0.0060 (0.0000 - 0.0340)	0.3 (0.0 - 2.7)
House Martin	4	13	0.0207 (0.0000 - 0.3234)	2.9 (0.0 - 22.7)
Willow Warbler	4	9	0.0034 (0.0000 - 0.0526)	0.3 (0.0 - 2.0)
Firecrest	4	11	0.0107 (0.0000 - 0.1423)	0.4 (0.0 - 2.7)
Mistle Thrush	4	8	0.0092 (0.0000 - 0.0344)	0.0 (0.0 - 0.7)
Brambling	4	7	0.0047 (0.0000 - 0.0759)	0.1 (0.0 - 1.0)
Siskin	4	4	0.0024 (0.0000 - 0.0195)	0.0 (0.0 - 0.7)
Swift	3	17	0.0171 (0.0000 - 0.1538)	3.9 (0.0 - 25.1)
Lesser Black-backed Gull	3	11	0.0060 (0.0000 - 0.0702)	0.5 (0.0 - 2.7)
Marsh Harrier	3	5	0.0013 (0.0000 - 0.0198)	0.1 (0.0 - 1.0)
Barn Owl	3	5	0.0012 (0.0000 - 0.0198)	0.1 (0.0 - 1.0)
Coal Tit	3	7	0.0078 (0.0000 - 0.1173)	0.0 (0.0 - 0.0)
Domestic Mallard	2	5	0.0061 (0.0000 - 0.0559)	0.3 (0.0 - 4.0)
Peregrine	2	3	0.0006 (0.0000 - 0.0000)	0.1 (0.0 - 1.0)
Jackdaw	2	2	0.0010 (0.0000 - 0.0000)	0.1 (0.0 - 0.0)
Reed Warbler	2	2	0.0007 (0.0000 - 0.0000)	0.0 (0.0 - 0.7)
Whitethroat	2	2	0.0003 (0.0000 - 0.0000)	0.0 (0.0 - 0.7)
Short-toed Treecreeper	2	8	0.0031 (0.0000 - 0.0385)	0.2 (0.0 - 2.0)
Black Redstart	2	3	0.0004 (0.0000 - 0.0000)	0.1 (0.0 - 1.0)
Redstart	2	2	0.0003 (0.0000 - 0.0000)	0.0 (0.0 - 0.7)
Wheatear	2	3	0.0004 (0.0000 - 0.0000)	0.1 (0.0 - 0.7)
Grey Wagtail	2	3	0.0007 (0.0000 - 0.0000)	0.0 (0.0 - 0.7)
Meadow Pipit	2	4	0.0008 (0.0000 - 0.0199)	0.2 (0.0 - 2.0)
Linnet	2	4	0.0008 (0.0000 - 0.0134)	0.1 (0.0 - 1.0)
Cuckoo	1	1	0.0003 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Moorhen	1	1	0.0004 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Lapwing	1	2	0.0003 (0.0000 - 0.0000)	0.2 (0.0 - 1.3)

Snipe	1	2	0.0006 (0.0000 - 0.0000)	0.1 (0.0 - 1.3)
Kittiwake	1	1	0.0003 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Black-headed Gull	1	1	0.0001 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Common Gull	1	1	0.0032 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Cormorant	1	1	0.0001 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Little Egret	1	4	0.0006 (0.0000 - 0.0137)	0.1 (0.0 - 1.0)
Long-eared Owl	1	1	0.0004 (0.0000 - 0.0000)	0.1 (0.0 - 0.0)
Great Spotted Woodpecker	1	1	0.0001 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Rook	1	1	0.0003 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Raven	1	1	0.0001 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Wood Warbler	1	1	0.0001 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Yellow-browed Warbler	1	1	0.0001 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Garden Warbler	1	1	0.0001 (0.0000 - 0.0000)	0.1 (0.0 - 0.0)
Pied Flycatcher	1	1	0.0003 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)
Stonechat	1	2	0.0003 (0.0000 - 0.0000)	0.0 (0.0 - 0.7)
Yellowhammer	1	1	0.0004 (0.0000 - 0.0000)	0.0 (0.0 - 0.0)

Table 5.3 Species summary over GBW sites in Guernsey in order of number of gardens recorded.

5.4 Recommendations/Discussions

Gardens are an important habitat on the island, covering about a third of the terrestrial land area on Guernsey and currently they are not well covered by GBW, the main garden-specific scheme, despite many people putting out food for birds in gardens. There is potentially a large audience that could be engaged to provide information about the wildlife in their gardens. From an avian perspective, encouraging more volunteers to take part in GBW would complement data from the Breeding Bird Survey and allow additional species to be monitored, particularly at other times of the year. It would likely bring new volunteers into biological recording as it is an entry level scheme. These volunteers may then go on to be recruited into other schemes.

GBW is a scheme that volunteers have contributed to financially, paying a small fee to take part. For this they become part of a wider family of Garden BirdWatchers and receive regular communications from GBW and support and advice on how to make their gardens more wildlife friendly. This has not necessarily been a barrier to uptake in the UK and moreover, a free membership offer was made in 2020 and likely to continue, but if it is going to be a scheme that is being promoted in Guernsey then communicating the benefits of GBW membership to volunteers will be an important factor in improving uptake.

Understanding how species use gardens and at which times of year is an important output of GBW. The current sample size is currently too small to do much with and will require a larger sample size and dedicated volunteers who will commit long-term to the survey. With appropriate publicity and messaging about monitoring Guernsey's garden wildlife, it is very likely that much higher rates of uptake can be achieved, as over 20,000 Garden BirdWatchers are signed up and around 6,500 submit data each year in the UK. This could be promoted through one of the NGOs on the island, or through the Biological Records Centre, although a coordinated push from the organisations in the Biodiversity Partnership would help. There are a number of citizen science initiatives taking place on the islands (e.g. the Pollinator Project, Bailiwick Bat Survey, the various bird monitoring projects) and a coordinated approach and appropriate targeting of audiences would be beneficial to avoid volunteer overload.

If the number of GBW participants is increased, it has the potential to dramatically increase the number of points that record terrestrial species. There is a very wide overlap with BBS in terms of the number of species, and GBW would largely be complementary/additional with the data gathered by BBS. This is unsurprising given the very fragmented nature of Guernsey's landscape and high degree of ribbon development. However, from the limited analysis of the GBW data, additional species could likely be monitored using GBW. Comparing the list of species for which BBS trends can be calculated, there are an additional four species that occur in >0.5 of gardens that are not on the BBS trend list - Herring Gull, Sparrowhawk, Long-tailed Tit, and Goldcrest. Herring Gulls visit gardens to scavenge food provided by householders and breeding and wintering numbers are best monitored as part of the Seabird Monitoring Program and the Wetland Bird Survey. Sparrowhawk and Long-tailed Tit are likely to be resident and GBW could be a useful way of monitoring these two species. Goldcrests will breed in some of the larger gardens with tall trees but many of the records will be of migrants and winter visitors. Looking at the occupancy rates, with sufficient sample size it would be possible to monitor species such as Bullfinch and Stock Dove, two species which are poorly known on the island.

Work is underway within the broader Garden BirdWatch work programme to develop methods for extracting annual trends, focusing on two time periods (breeding season and mid-winter). Once completed and tested at smaller region levels, these might be applied to the Guernsey dataset but are likely to require considerably more gardens than currently, for example in the order of at least 50-100.

6. BIRDTRACK

6.1 Introduction

BirdTrack is a semi-structured survey that is a joint partnership with BTO, the RSPB, Birdwatch Ireland, the Scottish Ornithologists' Club and the Welsh Ornithological Society. It is free to take part in and volunteers can record casual records or complete lists (a record of every species seen or heard during the observation period) from any location that the recorder chooses.

BirdTrack records can be submitted via the mobile application or the BirdTrack website, and the sites/location are selected as points, paths or polygons on the app or website and the geographic location is recorded as lat-long and grid reference as a 1km or 10km square on the British National Grid, or the Channel Islands grid. The start and end time is recorded and whether the record is casual (i.e. one bird species, often a rarity or of interest to the participant) or a complete list. Once this is completed the user can enter the bird species and the number of that species seen. BirdTrack now also has the capability to record a number of other taxa, such as mammals, orchids and butterflies, which are submitted to iRecord, or the relevant recording body (e.g. National Biodiversity Network).

6.2 Methods of the BirdTrack data Analysis

A summary of the BirdTrack data for Guernsey was extracted straight from the database held at BTO along with the BirdTrack dataset. This summary provided an overview of the timeframe that BirdTrack has been used on Guernsey and included the number of visits, separated into those that recorded complete or casual lists, the number BirdTrack locations, number of users, number of records of birds submitted and the number of casual records. From this dataset the species recorded across the whole time period in Guernsey was investigated and the number of observations/records for each species and the number of grid squares the species was present in is presented.

BirdTrack data were extracted from the database containing data from 2002-2020, as the number of records was sparse before 2002. This dataset was also summarised to include the total number of observations/records which is the number of rows (each one species) submitted regardless of the number of that species observed, the total number of records in complete lists, the total number of all lists (casual or complete), the total number of complete lists, which is a number of observations per recording period defined as casual (not recording every bird seen) or complete (record of every bird seen on the visit). The number of incidental records as the difference of total and complete list records, and the number of casual lists as difference of total lists and complete lists was also evaluated and presented.

Using the subsetted data, the number of complete lists per month were assessed for the latter three years using an in house BTO R package. This was then investigated to evaluate if species trends were possible, however, the lack of data, lack of data recorded as complete lists and inconsistency between years did not allow for any further analysis, including trends to be calculated.

6.3 Results

6.3.1 Summary of BirdTrack data coverage

Use of BirdTrack before ~2000 was poor (Table 6.1 and Figure 6.1). Figure 6.1 shows 313 sites over 82 1km or 10km grid squares in which data were recorded between 1975 and 2021. Some historic data has also been entered, e.g. from 1956. Due to the scarcity of data pre 2002, the data was cut off and further analysis was carried out on data between 2002 and 2020.

The highest number of users on Guernsey in one year was 15 in 2016 (Table 6.1), with an average of 7 between 2002 and 2020 (only 1 or 2 users pre 2002). A total of 293 bird species or subspecies were recorded across 81 grid references between 2002 and 2020 (Table 6.1). Blackbird and Herring Gull were recorded on the highest number of grid squares (47) and Herring Gull had the highest number of observations (224).

Once filtered to only contain data from 2002 to 2020, the total number of observations (rows of species) was 6,620, approximately half of which (3,123) were submitted as part of 214 complete lists (out of 2,598 lists, 8.2%) between 2002-2020 (Table 6.2). As a result of the lack of complete lists and data (e.g. Table 6.3 & Figure 6.2), we were unable to calculate reporting rates and trends from this dataset. However, the increase in reporting rates in 2020 and 2021 as shown in Figure 6.3 (b and c), albeit by a small and possibly the same number of users (6, Table 6.1), suggests that uptake is improving and continuing on this trajectory would allow for more analysis of this dataset.

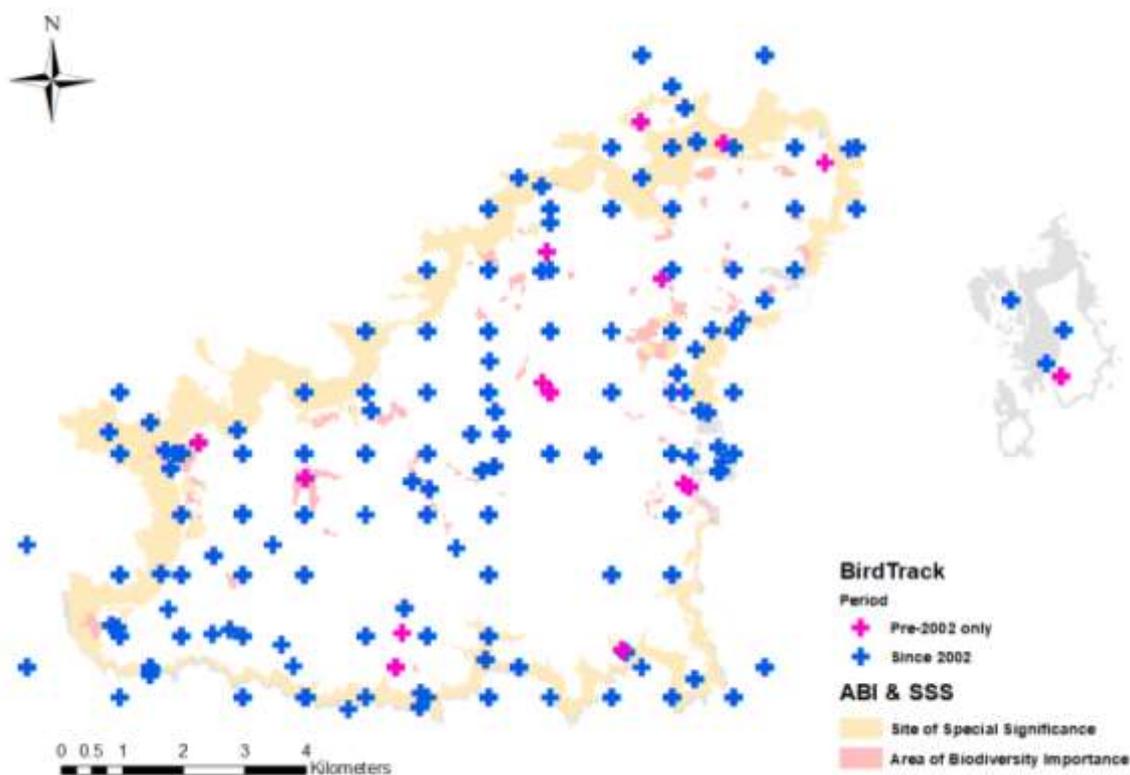


Figure 6.1. All BirdTrack locations on Guernsey between 1975 and 2020, coloured by pre 2002 or since 2002 on which analysis was carried out.

Year	No. of visits	No. of complete lists	No. of casual lists	No. of locations	No. of users	No. of records of birds	No. of casual records
1956	6	6	0	1	1	113	0
1957	8	7	1	1	1	225	5
1975	2	0	2	2	1	22	22
1980	3	3	0	2	1	14	0
1981	1	0	1	1	1	1	1
1982	4	1	3	4	2	71	47
1983	6	6	0	1	1	193	0
1990	5	4	1	1	1	107	5
1992	2	0	2	1	1	2	2
1994	1	0	1	1	1	12	12
1995	61	0	61	12	1	61	61
1998	1	0	1	1	1	1	1
1999	1	0	1	1	1	1	1
2000	8	0	8	7	2	31	31
2001	58	0	58	25	1	106	106
2002	90	4	86	37	4	319	241
2003	93	24	69	38	8	628	236
2004	76	7	69	39	8	262	136
2005	89	2	87	32	5	241	218
2006	39	0	39	25	2	62	62
2007	68	0	68	29	4	98	98
2008	48	0	48	27	3	63	63
2009	88	0	88	30	2	99	99
2010	617	4	613	116	7	695	648
2011	95	7	88	48	6	241	154
2012	105	3	102	56	8	222	174
2013	322	3	319	71	9	457	415
2014	447	15	432	99	11	704	473
2015	71	4	67	45	9	225	87
2016	108	24	84	72	15	689	188
2017	222	6	216	91	11	436	310
2018	74	14	60	40	8	428	174
2019	34	13	21	22	8	234	24
2020	145	110	35	23	6	1631	206
2021	152	120	32	21	6	1706	219

Table 6.1. BirdTrack data summary extracted straight from the database (held at BTO) providing an overview of the timeframe BirdTrack has been used on Guernsey and details the usage: the number of visits, visits that were recorded as complete or casual lists, the number locations, number of users, number of records of birds submitted, and the number of casual records for each year across Guernsey.

Year	First obs	Last obs	# complete lists (#observations)	# casual lists (#observations)
2002	01/01/2002	23/12/2002	4 (78)	79 (205)
2003	22/01/2003	28/12/2003	24 (392)	54 (99)
2004	11/01/2004	31/12/2004	6 (36)	56 (110)
2005	03/01/2005	29/11/2005	2 (23)	83 (199)
2006	13/01/2006	17/12/2006	0 (0)	37 (60)
2007	01/01/2007	31/12/2007	0 (0)	65 (94)
2008	05/01/2008	22/11/2008	0 (0)	45 (59)
2009	01/01/2009	30/12/2009	0 (0)	87 (98)
2010	01/01/2010	31/12/2010	4 (47)	604 (634)
2011	01/01/2011	15/11/2011	6 (78)	87 (149)
2012	01/01/2012	28/12/2012	4 (49)	82 (138)
2013	03/01/2013	31/12/2013	3 (42)	272 (356)
2014	02/01/2014	24/12/2014	14 (201)	375 (416)
2015	02/01/2015	30/12/2015	3 (106)	61 (81)
2016	10/01/2016	30/12/2016	19 (372)	71 (126)
2017	01/01/2017	23/12/2017	3 (48)	215 (294)
2018	01/01/2018	21/12/2018	6 (110)	57 (152)
2019	28/01/2019	27/12/2019	10 (169)	20 (23)
2020	02/01/2020	13/12/2020	106 (1372)	34 (204)
TOTAL			214 (3,123)	2,384 (3,497)

Table 6.2 Summary of BirdTrack data used in the analysis from 2002 to 2020. obs = single observation, list = a number of observations per recording periods defined as casual (not recording every bird seen) or complete (record of every bird seen on the visit). Both a complete and casual list can be a minimum of one observation.

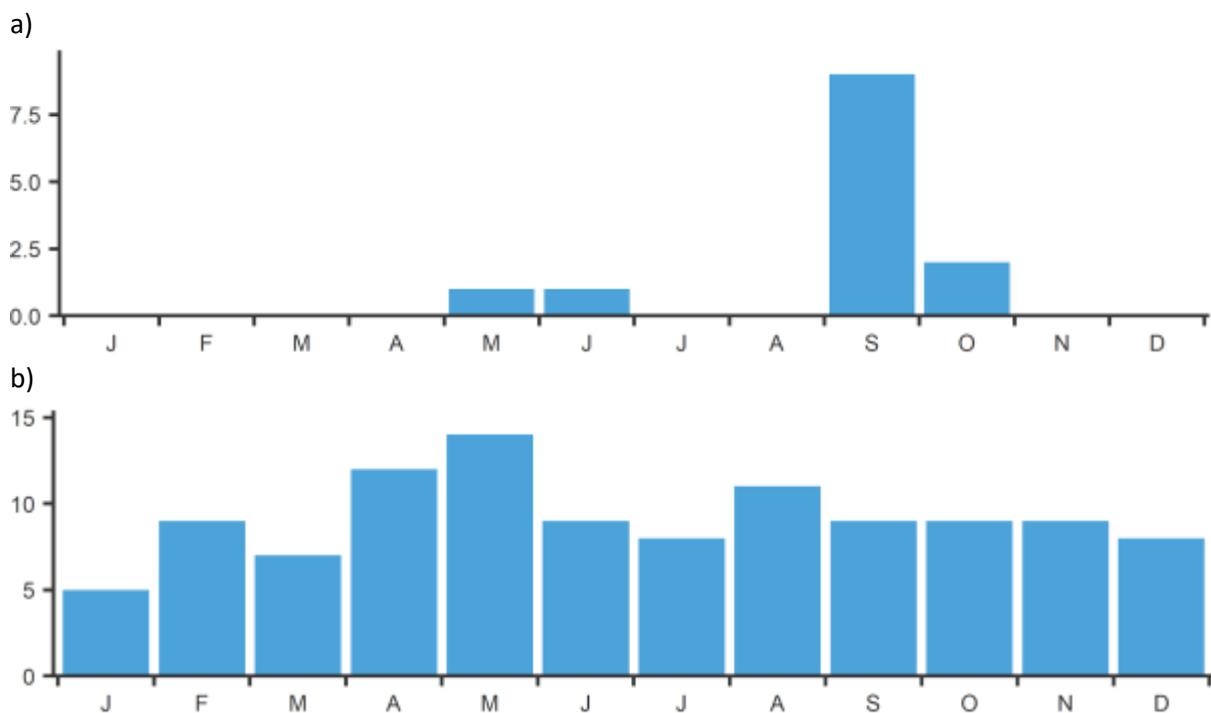




Figure 6.2 The number of complete lists recorded per month in a) 2019, b) 2020 and c) 2021 in the BirdTrack dataset across Guernsey.

6.4 Recommendations/Discussion

BirdTrack is an unstructured scheme run by BTO to record species at any location and at any time. Used largely by UK birdwatchers, it can be used anywhere in the world. BirdTrack also asks users to record whether their observation is part of a complete list, i.e. they have recorded all bird species present during their observation to the best of their ability or a casual record of say one or two species. The complete list therefore allows presences but also absences to be inferred from the complete list observation as we can confidently say that if a bird was not recorded then it was absent during the observations. From this, BirdTrack can provide reporting rates of species, yearly, monthly and even weekly if there is enough data. Trends can then be calculated, similar to the BBS trends for species with enough data. Unfortunately, there was not enough BirdTrack data for Guernsey to be able to calculate any further metrics, except the summary data and the species recorded along with the numbers of observations/sites recorded.

One recommendation would be to promote BirdTrack widely across Guernsey with easy access to the mobile application and the website format. Inclusion and promotion to obtain complete lists, especially, would allow more thorough data collection and therefore analysis, including reporting rates and trends, of the species recorded, particularly capturing species not covered by BBS such as wintering species and recording the timing of migrants. However, given that Guernsey Birds has a high profile and is already widely used by local birders, a better option would be to promote best practice and encourage data sharing across the two schemes, potentially allowing suitable data from both to be integrated for assessing patterns of occupancy in target species such as passage species or scarcer breeders not monitorable by BBS.

7. GUERNSEY BIRDS (www.guernseybirds.org.gg)

7.1 Introduction

Guernsey Birds (www.guernseybirds.org.gg) is a community site dedicated to bird watching in Guernsey. One of its main functions is to collect and disseminate information on Guernsey's birds. The Guernsey Birds website is run by La Société Guernesaise and is similar to BirdTrack in that it is an semi-structured recording scheme solely for the Bailiwick, although the majority of records come from Guernsey. This database collects occurrences of birds and other taxa (e.g. Odonata, Lepidopterans and marine mammals) frequently recorded by birdwatchers. It was set up in 2010 to allow birdwatchers to enter casual records or complete lists of their sightings.

Traditionally, records were captured at the monthly Ornithology Section meetings where a roll call was held and sightings were captured. From 1969 onwards, these were typed up into monthly 'Bird News' which was printed and given out to members at the next meeting. These did not capture information on common and widespread species. In the 1980s and 1990s attendance was high at these meetings but engagement with these meetings gradually dropped until often fewer than 10 people attended them. This was not indicative of the number of birdwatchers and was probably a result of changing lifestyles and a new approach of making a dynamic data-driven website, where people could enter their data, see recent sightings and compare themselves to others, was conceived. This became the Guernsey Birds Website. To date, approximately 250,000 records have been entered and almost 7,000 images of birds in Guernsey have been uploaded. As a result the database contains a wealth of information about local bird sightings.

The entry of data is entirely up to the user and there are no formal rules laid down. Users are invited to enter either casual records of birds they have seen or complete lists. For each, the type of data captured is similar. For casual records, species name is entered first. Users start typing the name and then a drop down menu with options will appear. They have to choose one of the options and the form will not accept any other species names. Sightings are entered on a site basis. There are 770 site names stored in the database which appear in a drop down menu once a user starts typing a site name. The user is encouraged to use one of these but is also free to choose their own site name. Users are not asked for the location of these new sites. The location is recorded as a place name and follows the traditional names used for sites in the older printed Bird News. Some sites are large and there are no formal definitions of sites (e.g. site boundaries) available. Users then enter a start and end date, the sex and number of species, and any notes about the observation. The username and observer initials are also recorded along with a free text box where the user can record any other details about the sightings that they wish. The number is a free text box with no verification and so the user can enter any text they want to - for example 'Present', '10-20', 'c.100' etc.

If the option to record a complete list is chosen the user enters the date and site name and a list of the species likely to be present at any one of the 770 site names in the database is displayed in a table. This is sensitive to the type of site (e.g. coastal, inland, woodland etc.) as well as the season. In the database these records are linked by the variable *list_ID*. Casual records do not have any value in *list_ID* and the entry is blank.

There is a year list facility whereby users are able to see how their sightings compare to others, and to those across the entire year. This may lead to some common species being recorded in the first few weeks of January by some observers, and then not after. Many users will also be motivated by how they value the species, for example they may be more likely to record a species depending on how rare it is. Common species, such as Wrens may be less likely to be recorded. To be used as a monitoring tool, Guernsey Birds data could potentially be used to monitor species that are common or scarce in the island. Vagrants are assessed by the Channel Islands Rarity Committee. These require some form of verification in the form of a photo or written description.

In this section we summarise the data stored on the Guernsey Birds database, assess what species could be monitored through this scheme and suggest recommendations.

7.2 Method of Analysis

While the species names are standardised, the names of locations are not. The number of locations was tabulated, but these should be treated with caution as there are a number of locations with multiple variants of different spellings, or names.

The time period of the scheme, the number and list of species recorded, and the number of observations of each species was investigated and summarised. To investigate effort and whether any trends or reporting rates could be calculated, the average number of complete lists (records with a *list_ID* recorded) per month over the time period (2010-2020) and for each year (supplementary material) and the total number of complete lists each year were calculated.

As the number of complete lists or the number of records with a *list_ID* varied by month each year (see graphs in supplementary material) the reporting rates of individual species, i.e. how often a species is detected over a period of time, could not be calculated by year, but they could be calculated per species within a year (not presented) if required, for example, to report on the seasonal pattern of occurrence of migrants, including their arrival and departure dates.

7.3 Results

7.3.1 Summary of data coverage

As locations are all place names across Guernsey, rather than grid references or GPS coordinates, there are approx. 3000 different/unique site names with data recorded. However, these should be treated with caution as discrepancies in the spelling of the location name has resulted in multiples of the same sites (and can also include Alderney) as there are only 770 site names saved on the website.

Guernsey Birds went live at the end of 2009 and some users were invited to test the system. This was rolled out to all users at the start of 2010. Users were also invited to enter older records from before 2010 and volunteers also entered sightings from observers who entered data into books left in bird hides on nature reserves. The earliest records are from 2001, with only a handful of observations collected in 2001, 2003 and 2006, less than 200 in 2007 and 2008. After the live roll out of Guernsey Birds, observations jumped ten-fold to 1514 in 2009, and again in 2010 with the most records collected in 2011 (28538 observations, Figure 7.2). The maximum number of users in one year was 72 in 2012, with an average of 41 users over the whole time frame and an average of 59 users between 2010 and 2021 (Figure 7.1).

A total of 409 species were recorded in Guernsey Birds over this time period, 348 were birds (see Table A7.1 for the full list), the remainder consisted of species of butterflies, moths, damselflies and dragonflies, amphibians, and mammals both terrestrial and marine. The species recorded using Guernsey Birds is summarised in Table 7.1, which shows that 98% of the common species and 100% of the quite common species in the database have more than 50 records and 195 scarce/rare/very rare/vagrant species, as a result of being rare, have less than 50 records and only 1 rare species (1%) has more than 50 records. This suggests that both common and rare species can be monitored through Guernsey Birds.

52,272 out of a total 246,617 observations were inputted as complete lists to the Guernsey Birds database, that is 21% of all observations, and 5417 individual complete lists were recorded. Figure 7.4 shows that the most complete lists were entered in 2011 (873) and 2012 (840) with a gradual

decline in the entering of complete lists, suggesting poor uptake after this time which may require reminding users of this feature and the value of complete lists as this would allow us to infer absences for further data analysis. As previously mentioned, the number of complete lists per month over the whole time period in Figure 7.3 suggests that users may input their yearly bird lists in January, possibly capture/record migrants in April and May and in October, but not enter complete lists, and therefore data, consistently throughout the year. Figure A7.1 also shows that the monthly complete lists vary from year to year, therefore effort will differ between months and years resulting in any further analysis to be complex and time consuming.

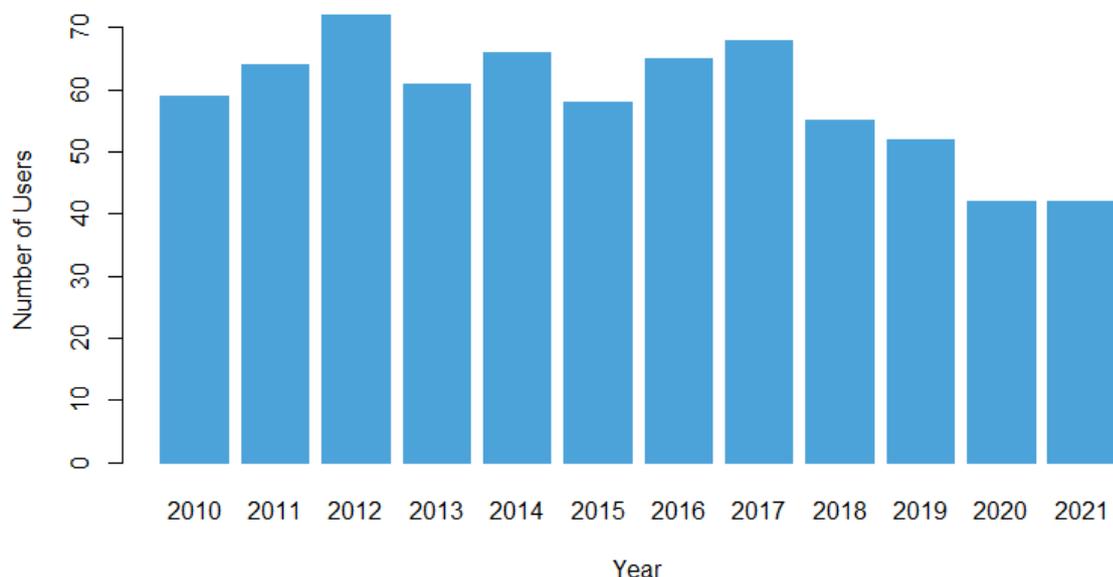


Figure 7.1 The number of users submitting data to Guernsey Birds each year between 2010 and 2021.

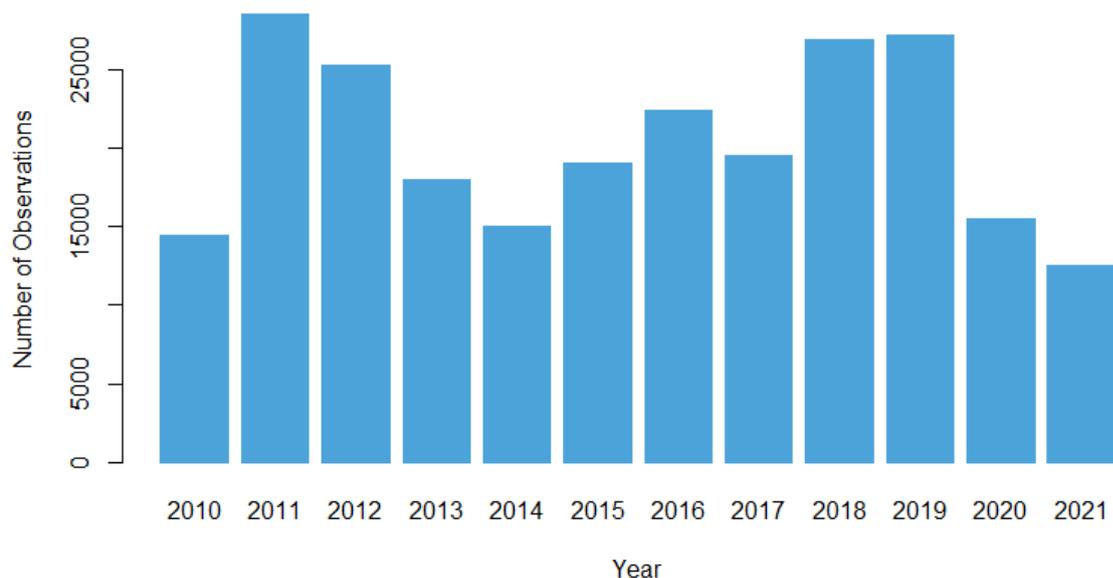


Figure 7.2 The number of observations recorded using Guernsey Birds each year between 2010 and 2021.

Status	<50 records per year	>=50 records per year	%
Common	1	58	98
Quite common	0	23	100
Uncommon	22	28	56
Scarce, Rare, Very Rare, Vagrant	195	1	<1%

Table 7.1 The number of species which have more or fewer than an average of 50 records submitted to Guernsey Birds each year for the period 2010-2020 based around how common the species is, and the percentage of species with more than 50 records on average per year.



Figure 7.3 The total number of complete lists in the Guernsey Birds database per month over the time period 2010-2020.

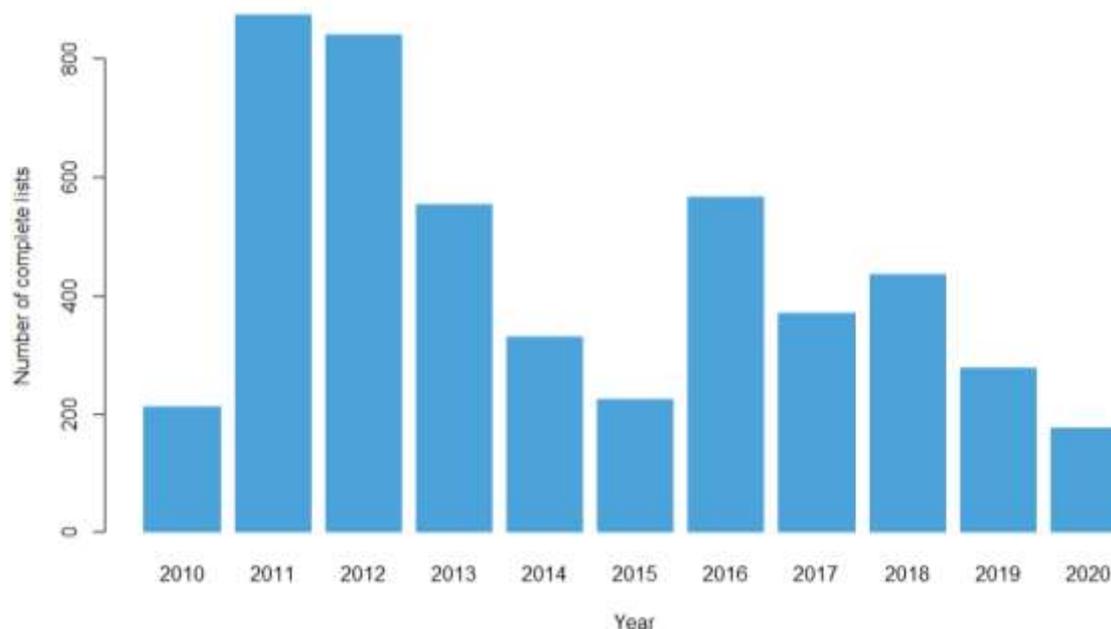


Figure 7.4 The total number of complete lists recorded each year in the Guernsey Birds database.

7.4 Recommendations/Discussion

Guernsey Birds has had great uptake since it went live in 2010, with an average number of 41 users over the whole time period, although usage has dropped a little in the last couple of years, but this could be as a result of the current pandemic. Further to this, the recording of complete lists (all the birds seen during the recording period) decreased dramatically after 2012, so promotion of continuing to record complete lists, particularly regularly throughout the year and between years, would allow more thorough analysis, including reporting rates, and monitoring.

As birdwatchers like to record scarcer species, Guernsey Birds will likely pick up most of the scarce birds recorded in the islands. It also has the potential to record more common species throughout the year as there were consistently >50 records submitted per year for 98% of the species classed as common. This, along with the complete list recording, could allow better monitoring of more common species.

One major and important recommendation would be to allow for a more accurate recording of location information using either a GPS location or a grid reference at the 1km scale or finer, as at the moment the location is poorly defined and the site names are often ambiguous. Alternatively, another option, considering the problems with the various grid reference systems that could be adopted/used on the island, is to develop the list of clear and comparable site names. Allocation of names and grid references would need to be undertaken as a separate project by someone with local knowledge. It would be useful to keep these updated and possibly be stricter on how site names are recorded, as maintaining a list of places on an island would be more feasible than for say the whole of the UK.

A data clean up would also be useful and to have records in similar locations merged – this will require more time and work, and would benefit from local knowledge, but would help to keep the records tidy and manageable especially for any spatial analysis, or even more accurate locations of sightings, if required.

At the moment numbering of species is free hand, e.g. c100 or +50, therefore any analysis on species abundance analysis may simply ignore these data points. Where possible, limiting the records to numbers only may allow for a larger and complete dataset for analysis. Although, for presence/absence analysis this is irrelevant and it is the complete lists that are important for inferring absences.

In order to make the most out of observations from both BirdTrack and Guernsey Birds, if there are not many users of BirdTrack on the island then the county recorder or a designated person can access and download records from BirdTrack once organised with the BirdTrack Organiser at BTO. If there are a lot of records being submitted then it may be worth getting an automated system where the BirdTrack records are fed into Guernsey Birds and could appear on the website, however, there would obviously be a development cost to this, whereas the downloads, however frequent, are free through the county recorder or designated person, e.g. the BTO staff working on this summary each year. It is worth noting that there is duplication within and between the two schemes already, as even within one scheme, many participants might separately record the same rare vagrant, which will be visiting a number of areas. A flock of Snow Buntings or a Black Redstart on a beach may well be recorded in Guernsey Birds and/or BirdTrack multiple times and some bespoke assessment of how the records translate to an estimate of numbers will be required. In sharing data between schemes, it is possible to keep a scheme identifier associated with the record in the underlying database. Moreover, birdwatchers tend to stick to the system they are most familiar with and there is no point in encouraging duplicate reports.

8. SEABIRD MONITORING

8.1 Introduction

Being a group of small islands, seabirds are a major feature of the Bailiwick of Guernsey's avifauna. In comparison with other groups of birds, and along with wintering waterbirds, the change in breeding numbers since 1969/1970 is relatively well understood through the national seabird monitoring programs, but little is known about their foraging ecology, or importance of the Bailiwick's waters for seabirds outside the breeding season.

The Bailiwick's seabird colonies are significant in national terms, supporting more than 1% of the Great Britain, Isle of Man and Channel Islands population of 6 species (Storm Petrel, Northern Gannet, European Shag, Great Black-backed, Herring and Lesser Black-backed Gull) as well as internationally, supporting more than 1% of the biogeographic population of three species (Northern Gannet, European Shag and Lesser Black-backed Gull). Guernsey and Herm together only support more than 1% of the national population of European Shag and no species exceeds 1% of the biogeographic population. The national censuses can only give a snapshot of the numbers of breeding seabirds at that time. These are useful for documenting long-term changes in population but do not provide the evidence to understand the mechanisms behind any population change.

During spring and autumn, counts of migrating seabirds are made on seawatches from coastal headlands by birders. When the winds are favourable (usually northwest in Guernsey), migrating birds are pushed closer to the coast. Observations are usually undertaken from north coast headlands (e.g. Chouet, Jaonneuse, Fort le Marchant), but also from the west coast as well and the timing of migration of the different seabird species that pass Guernsey's shores are relatively well documented, but no formal analysis of these data has been undertaken.

Seabirds are a top predator in the marine environment and, especially the fully marine species, can be very sensitive to environmental change. Some species have been affected by changes in fishing policy and practice, renewable energy installations, as well as the impacts of climate change, which has been clearly demonstrated in the case of the Balearic Shearwater, which first started appearing in Bailiwick waters in large numbers in 2004.

Introduced mammalian predators are one of the greatest threats to seabird colonies. Seabirds evolved to breed on remote predator-free islands and the introduction of these predators can have a severe impact on breeding populations and subsequent recolonisation. Mammals such as Brown Rats, feral ferrets and cats can decimate and prevent colonisations of seabirds, especially burrow-nesting species. This was clearly demonstrated in Sark, where bodies of Manx Shearwaters in the breeding colony were presumed to have been killed by a cat, but the more pervasive and less obvious impact of rats can only really be demonstrated when eradication programs are undertaken.

To understand and diagnose the changes in breeding seabird populations, it is essential to understand the demography and ecology of the species and also monitor those environmental features that might impact annual productivity and survival. Seabirds are long-lived and many species can show complete breeding failures interspersed with good breeding seasons. As adults are so long lived (e.g. a Fulmar can live for >50 years) and tend to have high annual adult survival, if breeding success (and recruitment into the population if that is possible) is not monitored, it is very easy not to notice when the population is becoming unviable as population change is very gradual as the adult begin to senesce and there are few recruits coming into the population to replace them.

The annual Seabird Monitoring Program run by JNCC collects breeding success estimates of 25 species of seabird and the States of Guernsey is a partner in this scheme, although only the national counts are in the database, and no breeding success data has been entered from Guernsey. Survival can be estimated using ringing and colour-ringing of chicks and adults. The Channel Islands have

their own ringing scheme and large numbers of seabirds are ringed annually. Little analysis of the ringing recoveries has been undertaken to determine trends in annual survival, the Gannet being the main exception (Warwick-Evans *et al.* 2016). The main take home message from this study was that even with large numbers of chicks ringed, without having adults ringed or colour-ringed it was impossible to determine exactly where mortality occurs in the life cycle. Colour-ringing was recommended as an important tool in monitoring the demography of seabird populations.

With the advent of light-weight GPS loggers, there is an opportunity to look at where different species forage and how that changes over time. A long-term tracking study of breeding Gannets in Alderney, for example, has shown how Gannets responded in terms of where they forage for food in relation to sea conditions that year as well as the impacts of wind turbines on the population (Warwick-Evans *et al.* 2016, 2018).

There is anecdotal evidence from seabird ringers that environmental conditions are important. In years with a large number of storms in early summer, the Bailiwick's waters can become very turbid and visibility is very poor. This has been associated with almost complete breeding failure by European Shags. Without more formalised and regular monitoring of breeding success and environmental conditions, it will not be possible to determine the impacts of environmental change on the Bailiwick's seabirds.

8.2. Methods used in the Seabird Monitoring Program and national censuses

8.2.1. Periodic censuses

The first survey of the island's colonies took place in 1970 as part of *Operation Seafarer* (1969-1970) which was organised by the British Seabird Group and resulted in a book which included counts of breeding seabirds in the Channel Islands (Cramp *et al.* 1974). Approximately 15 years later, the *Seabird Colony Register* (SCR) took place between 1985 and 1988, with a similar objective to assess breeding seabird numbers and compare with the Operation Seafarer survey 15 years earlier. Guernsey was not included in the book that was produced (Lloyd *et al.* 1991), but counts were undertaken and a separate book was published (Hill 1991). Bailiwick counts were included in *Seabird 2000* (1998-2002, Mitchell *et al.* 2004, Hooper 2006), with most survey work being undertaken in the Bailiwick between 1999 and 2001 (Hooper 2006), and also in the most recent census *Seabirds Count* (2015-2021, Veron & Veron 2016).

The methods used to census the seabirds in Guernsey and Herm (and the rest of the Bailiwick) have been similar across all surveys and, depending on the species, Apparently Occupied Nests (AON), Apparently Occupied Sites (AOS) or number of individuals are recorded. The major colonies were visited one or more times throughout each main survey period and a single value, or a range of values, given for each species. Ranges tended to be given when there was uncertainty in the counting due to visibility issues, or multiple counts across different years. Guernsey was divided up into a number of sectors that included the south coast cliffs (east and west zones), the west coast (including Lihou and Lihoumel) and the east coast (including Omptolle and Houmet Paradis). Herm, the Humps and Jethou were counted separately.

8.2.2 Data capture and storage

Data on breeding abundance is stored in JNCC's Seabird Monitoring Programme (SMP) database which has recently been transferred to BTO. Data from only the most recent surveys were captured electronically and all the old data will be stored on paper forms. The SCR register was undertaken by Mike Hill and boxes containing his detailed census records are stored at the Guernsey Biological Record Centre (GBRC). It is not known if paper records for Operation Seafarer are stored there.

8.2.3. Monitoring breeding success

The Seabird Monitoring Programme (SMP) is an ongoing annual monitoring programme of 25 species of seabird that breed regularly in Britain and Ireland. Established in 1986, this programme is a partnership of 19 organisations (including the States of Guernsey), and is coordinated by the Joint Nature Conservation Committee (JNCC). It aims to ensure that sample data on both breeding numbers and breeding success of seabirds are collected, both regionally and nationally, to enable their conservation status to be assessed. A handbook of standard methods is available (Walsh et al. 1995) and these methods are used to survey the different seabird species and measure breeding success.

Along with annual monitoring, the SMP is also supplemented by the periodic national censuses, which aim to provide counts for all sites in Britain and Ireland. Seabirds Count 2015–2021 is the 4th national census.

The seabird monitoring handbook (Walsh et al. 1994) gives full details of the methods used to census the different species.

8.3 Results

8.3.1 Periodic censuses of breeding seabirds in the Bailiwick

Coverage of the Bailiwick in all four of the main national seabird censuses has been complete or near-complete, as all the major seabird colonies in the Bailiwick were visited. Access difficulties to some of the smaller rocks such as Grosse Rock may mean that a few sites were not counted. However, these would only contain a very small number of birds, mostly gulls, and would not impact the overall results or conclusions drawn from them. For Guernsey and Herm, the counts obtained are sufficient to monitor long-term changes in breeding populations of Herring, Great and Lesser Black-backed Gull, European Shag, Great Cormorant, Fulmar, Common Tern, Razorbill, Guillemot and Puffin and fulfil the requirements of the periodic national monitoring schemes. However, as these are gaps of 10-15 years between these censuses, additional interim monitoring is desirable.

In terms of species, only Manx Shearwater and Storm Petrel, species that attend the colony at night, have been difficult to census. Various attempts have been made to survey these species. Approximately, 10 pairs of Manx Shearwater were found breeding on Jethou in 1990 through playback at the entrance of burrows in June 1990. This colony was presumed extinct during survey work in Seabird 2000, but playback at burrows elicited responses from 8 birds in June 2021. Only the males tend to respond to playback (Walsh *et al.* 1995) so, assuming these 8 birds were all male, Jethou probably holds in the order of 10 pairs of Manx Shearwater. No firm evidence of breeding Storm Petrels has been found.

Sark has the only other known colony of Manx Shearwaters, although there is doubt to their continued existence due to past predation by feral ferrets and cats. They have also been heard several times on Burhou (e.g. one recent occasion in July 2016, Veron & Veron 2016) and a Bailiwick-wide census, perhaps using passive acoustic recorders, followed by targeted fieldwork in areas where their presence was detected would provide a good baseline.

8.3.2 Collection of breeding success data and breeding count data outside the main seabird censuses

The SMP, of which the States of Guernsey is a partner, is designed to monitor the ongoing health of seabird populations and also collects data on breeding success on an ongoing basis. However, with the exception of Mike Hill extending the Seabird Colony Register by two years (1989 and 1990) and

some records of Common Tern in 1992, there is no other 'extra' data in the database outside of the four main censuses.

8.3.3 Completeness of the data in the Seabird Monitoring Programme database

We ran an extraction from the database for all Bailiwick sites. Operation Seafarer data from Guernsey and Herm have not been entered into the SMP database. Mike Hill visited some colonies over a number of years for the Seabird Colony Register, and the data in the database is a single figure for each site and year. Comparing these numbers with those in Mike Hill's book (Hill 1991) does throw up some questions as to exactly how reliable the summary figures are and there are many apparent discrepancies. These data are held on paper in the GBRC and it is recommended that these data are checked and amended to ensure the national database is up to date. The last two censuses (Hooper 2006, Veron & Veron 2016) appear to have been entered correctly into the database.

8.3.4 Ramsar site coverage

The two Ramsar sites are adequately covered by the major seabird censuses. The *Herm, Jethou and The Humps* Ramsar site covers 1,803 ha and consists of two islands (Herm and Jethou), nine rocky islets (including Grande Fauconnière, Crevichon and Brehon Tower), six sandbanks (The Humps) and surrounding shallow tidal waters. All of the islands and rocky islets are counted.

The *Lihou Island and L'Erée Headland, Guernsey* Ramsar site covers 427 ha and comprises several coastal areas on the west coast of the island of Guernsey, including the shingle bank Les Anguillieres and the western end of L'Erée Headland as well as the small northwestern Lihou Island and surrounding marine coastal areas. The main seabird interest is on Lihou, and this and the small Lihoumel islet are included in all of the main seabird censuses.

The Ramsar Convention requires parties to designate and maintain wetlands and it is inherent in the agreement and subsequent Meeting of Parties that parties monitor the wetlands and ensure their wise and sustainable use. Obligations on parties include requirements to understand and manage the site, to maintain its ecological character, and to have procedures in place to recognise that this character is changing in a negative way, so that any change can be managed. For this reason, Article 4.2 of Ramsar states that limits of acceptable change (LAC) should be identified for each site.

ACLMS (Agriculture Countryside Land Management Services) are the authorised authority for the Herm Ramsar Site and are responsible for developing and implementing the Ramsar Management Plan, and to ensure that resources and funding are identified to adequately achieve objectives within it.

Apart from ringing data and periodic censuses, no data are collected regularly on seabirds in the Ramsar sites as far as we are aware.

There is no management plan currently in place for the Lihou Ramsar site, but there is for the Herm Ramsar site. This includes a seabirds subgroup and an action plan for this subgroup ran for a three year period (2018-2020), which included a number of activities: (i) breeding bird surveys by boat to measure population size and productivity for 'several species', (ii) burrow surveys for nesting Manx Shearwater and Storm Petrels and (iii) seabird ringing which includes colour-ringing Cormorants. The data requirements and limits of acceptable change were developed for (i) and (ii) but not the ringing studies.

From a Ramsar perspective, information on breeding numbers and breeding success are the priority. For some species (e.g. cliff-nesting gulls), it may be possible to collect these data by boat, but for species such as European Shag and auks, it would be necessary to land and undertake searches on the ground. European Shags often nest under boulders and while the nest sites may be visible from a

boat (the white guano streaked rocks are clearly identifiable), landing will be necessary to verify how many nests are present and the number of chicks.

Understanding the demographic causes of population change is an important part of any monitoring plan, e.g. is it first-year or adult survival, immigration or emigration that are causing population change? Most seabirds are metal-ringed as chicks and recovered dead. Because individuals are generally not encountered alive after they become adult, adult survival and reporting rates become conflated with juvenile survival. Juvenile survival is much lower than adult survival and it is not possible to obtain any independent estimates of adult survival, without birds subsequently being encountered alive after ringing. With metal-ringing only, it is not therefore possible to determine with confidence where mortality occurs in the life cycle and how that varies over time.

Metal ringing has been undertaken at the Bailiwick's colonies for many years and there is reasonable information on where birds go at different times of year but, as it currently stands, this alone is not a useful tool for estimating survival and a reappraisal of how to best undertake seabird ringing to provide the data requirements for ACLMS, the Ramsar authority, is needed.

Colour-ringing adults and/or chicks and, importantly subsequent resightings, will provide the necessary information to estimate adult and juvenile survival separately. A colour-ringing study has been undertaken on gulls in the Bailiwick, and it would be extremely useful to analyse these data to inform any future studies. A colour-ringing scheme has also been undertaken on adult Gannets in Alderney by the Alderney Wildlife Trust.

Regular assessment of management and monitoring plans are essential and the Herm Ramsar Implementation Strategy is reviewed every 6 years, so it is recommended that a rolling program of work is planned for every six years, approved by ACLMS and provided appropriate funding. Ideally, annual censuses of the 10 species of seabird (this includes Common Tern which was absent in the last seabird census) would take place. Some of these counts could be undertaken by bird ringers visiting the offshore islands, with the priority given to collecting this information - a discussion with the individual ringers would be required. For onshore counts, local birdwatchers could be asked to survey sections of coast. Productivity and numbers can be estimated using the standard methods in the Seabird Monitoring Handbook. For species like European Shags that use traditional nest sites, these sites can be permanently marked, GPS location recorded and surveyed each year. Although annual counts are the ideal, logistical and budgetary constraints may require a rolling program of counts on the more difficult to access colonies.

To ensure consistency within the Bailiwick, it is recommended that any monitoring plan is consistent with the Ramsar site monitoring in Alderney. This has its own Ramsar Advisory Group, and for the last 15 years has had its own series of rolling 5-year management and monitoring plans.

8.3.5 Counts of seabirds outside the breeding censuses

No formal surveys are undertaken outside the breeding season, but opportunistic observations are made by birders and entered into the Guernsey Birds database (www.guernseybirds.org.gg) (Table 8.2) or other online recording platforms. These tend to fall into two categories – (1) more formal seawatch data and (2) casual observations. There are a group of birders who undertake seawatches, generally from one of the north coast headlands (including the dedicated sea watch hide at Chouet) in spring and autumn when the wind is from the northwest and these are often entered as a timed species list or, if not, the observers will have them in their notebooks. These records document passage seabirds that pass by Guernsey on migration. Many species will come from northern colonies but the remarkable Sooty Shearwater makes a huge clockwise migration from breeding areas in the southern ocean (e.g. Falkland Islands), up the western Atlantic in the northern spring to spend the northern summer in the north Atlantic. Then in summer/autumn they move down into UK waters on their return to the southern ocean to breed.

Many seabird records will be from casual records, especially those species that are scarce or rare, as birders tend to particularly record those. The most significant of these is the Balearic Shearwater which is Critically Endangered. It has a small breeding range and a relatively small population (19,000 individuals, BirdLife International 2021) which is undergoing an extremely rapid decline, largely related to low adult (and immature) survival rates (BirdLife International 2021). Its main threats are fisheries by-catch at sea and predation at breeding colonies by introduced mammals. Population models predict over 90% decline in three generations with an average extinction time of about 60 years, hence qualifying the species as Critically Endangered.

During summer and early autumn, large numbers of Balearic Shearwaters congregate off the southwest coast of Guernsey. This species breeds in the Mediterranean and, after breeding, birds undertake a moult migration and move north to moult in large flocks, usually around the Pleinmont and Hanois area, but flocks of 1000+ have also been seen at Chouet. As sea temperatures have warmed, their distribution has shifted and a significant amount of at least 15% of the global population (and probably undercounted), have moved to moult in Bailiwick waters. They were first noticed in 2014 (Figure 8.1) and large rafting flocks of moulting individuals have become a feature from mid-June to mid-July.

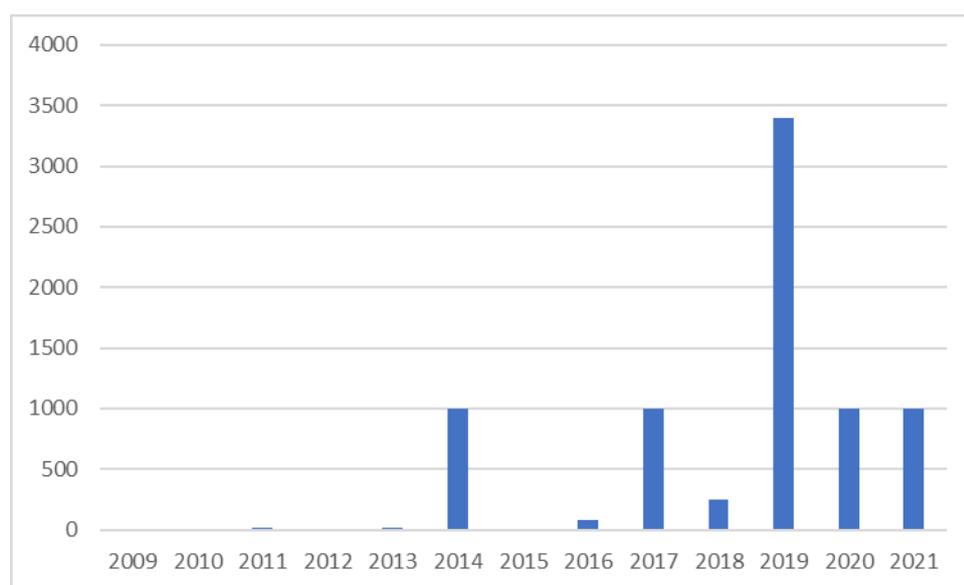


Figure 8.1 Peak counts per year of Balearic Shearwater in the Guernsey Birds database from 2009 onwards.

In 2010, a tagging study undertaken in Mallorca (Guildford *et al.* 2012) showed that Balearic Shearwaters spent approximately 3 months outside of the Mediterranean. They entered the Atlantic Ocean on an average date of 27th June (range: 31st May – 11th July) and returned on an average date of 23rd September (range: 8th September to 3rd November). Numbers recorded in traditional post-breeding quarters, centred on the French Biscay coast, have declined since the mid-1990s (Wynn & Yésou 2007) and now show marked inter-annual variability. In contrast, numbers recorded from northwest European coastlines have increased since the mid-1990s, the majority being seen along the coasts of northern France and southwest Britain, with smaller numbers north to southern Scandinavia. Corresponding with an increase in sea temperatures, there has been a biogeographic shift northwards in plankton (calanoid copepods), fish prey (anchovy and sardine) and the Balearic Shearwaters in the period 1980-2003, with a significant shift noted between 1994 and 1996 (Luczak *et al.* 2011) This study confirmed both a direct and an indirect effect of climate change on the spatial distribution of post-breeding Balearic shearwater through a trophic cascade.

English Name	Total	English Name	Total
Red-throated Diver	19	Mediterranean Gull	1240
Black-throated Diver	260	Little Gull	79
Pacific Diver	17	Sabine's Gull	26
Great Northern Diver	921	Bonaparte's Gull	32
Slavonian Grebe	501	Black-headed Gull	2368
Black-necked Grebe	189	Common Gull	443
Black-browed Albatross	1	Lesser Black-backed Gull	1444
Fulmar	874	Herring Gull	3986
Cory's Shearwater	14	Yellow-legged Gull	413
Great Shearwater	9	Caspian Gull	25
Sooty Shearwater	319	Iceland Gull	320
Manx Shearwater	741	Iceland Gull (Kumlien's)	50
Balearic Shearwater	677	Glaucous Gull	158
Wilson's Petrel	11	Great Black-backed Gull	2095
Storm Petrel	184	Kittiwake	807
Gannet	2047	Caspian Tern	2
Cormorant	1886	Royal Tern	217
Cormorant (Continental)	23	Sandwich Tern	1691
Shag	2025	Common Tern	400
Eider	33	Arctic Tern	79
Long-tailed Duck	156	Little Tern	24
Common Scoter	473	Black Tern	63
Velvet Scoter	14	Guillemot	597
Grey Phalarope	81	Razorbill	990
Pomarine Skua	130	Black Guillemot	2
Arctic Skua	348	Little Auk	15
Long-tailed Skua	29	Puffin	304
Great Skua	557		

Table 8.1 Number of records of seabirds (unverified) entered into the Guernsey Birds database 2020-2021.

8.4 Discussion

8.4.1 Breeding seabirds

Long-term changes in breeding seabirds are monitored through the periodic national censuses but little additional information on breeding numbers has been collected in between these and no formalised recording of breeding success has been undertaken as part of the Seabird Monitoring Program.

Ideally, as takes place in Alderney, there would be an annual program of counting seabirds and estimating breeding success. The Alderney Wildlife Trust can do this as they employ a dedicated Ramsar field officer who carries out the annual Ramsar site monitoring. The Ramsar plan is updated every 5 years and approved and funded by the States of Alderney. This has not previously happened in Guernsey and collection of extra data will likely rely on volunteers. Annual censuses would be ideal but may not be feasible due to the workload and expense involved and a compromise would need to be worked out. This could be censused every 2-3 years, or a program of annual monitoring for, e.g. three years, with a three year gap before the next series of censuses.

Counting seabirds, and especially monitoring breeding success will require skilled volunteers who are able to access the different breeding colonies. Some, such as Lihou, and Guernsey, Herm and Jethou shoreline can be accessed by foot but the Humps will require a team of people and a boatman who knows the area. Traditionally these areas are visited by bird ringers who could be approached to help with other aspects of monitoring. This may not be possible in some cases as minimising the time in some colonies is more of a priority than spending longer and collecting extra data. This is a discussion that needs to be had with the individual ringers.

Breeding success for some cliff nesting species can be undertaken on fixed plots. European Shag nests tend to be traditional sites used year after year. These can be individually numbered and permanently marked to easily enable year-on-year monitoring and comparisons.

Traditional metal ringing of chicks is not useful for estimating demographic parameters. Additional colour-ringing projects with subsequent resightings will give data on recruitment and survival and birdwatchers would need to be made aware that individuals are colour-ringed, possibly through the Guernsey Birds website. Species that would be suitable are: Shag, as individuals can be seen out of the water drying their wings, Herring, Lesser and Great Black-backed Gulls. We would not recommend colour-ringing Fulmars, auks, terns or burrow nesting species as resighting these would be extremely difficult.

8.4.2 Non-breeding seabirds

In conservation terms, the rafts of moulting Balearic Shearwaters are the most important migrant seabird in the Bailiwick's waters. There will be other regular migrant and winter visitors, some of which are obvious such as non-breeders like Black-headed and Mediterranean Gulls, but there will be influxes of other gulls mixing with the resident breeders in autumn, winter and spring.

Offshore we know very little about the at-sea distribution of seabirds in the Bailiwick. Large areas can be surveyed using aerial photography or high-definition video (e.g. [APEM](#) or [BioConsultSH](#)) and a series of monthly surveys in June, July and August would provide a much better understanding of the importance of Bailiwick waters to Balearic Shearwaters and the oceanographic features that are associated with the flocks. For example, frequent thermal fronts occur in Bailiwick waters through thermal stratification and the meeting of currents, and these fronts are associated with increased productivity and increased numbers of the fish the shearwaters prey on.

Offshore aerial surveying would give a snapshot of the seabirds and cetaceans using Bailiwick waters. The Company HiDef, for example, uses high definition aerial photography. The aeroplane flies up-and-down transects and photographs are taken by four cameras from a flight height of around 550 m (1,800 feet), covering a transect width of a total of 500 m (125 m by each camera). This is high enough not to disturb birds. The high resolution of 2 cm per pixel and a fast recording rate of 7 images per second allows the aircraft to fly faster than a manned survey, allows a larger area to be covered in less time, and dramatically improves identification, objectivity and reliability. The high-definition photography allows identification of birds, even at higher sea states.

Gulls in winter will be well monitored by the Wetland Bird Survey (see chapter 9). They clearly show the increased number of Lesser Black-backed Gulls in winter, presumably due to warmer winters and perhaps the availability of anthropogenic food available at the refuse tip but large crashes in the number of wintering birds in the 2019/2020 winter, coinciding with the Mont Cuët refuse tip closing.

There is a wealth of data available on migrating seabirds from seawatches from coastal headlands, and it would be useful to collate this information as it will span a 30-40 year period. Changes in populations may be reflected in these data. These data are in GuernseyBirds and held by individual birdwatchers.

8.4.3 Monitoring of mammalian predators

In the Bailiwick, rats, cats and ferrets are known to be predators of seabird eggs, chicks and adult birds, and hedgehogs will also take bird eggs. Rats will occur on all of the main islands but the distribution of feral cats and ferrets is less well known and, without any formal surveys, it is not possible to determine how widespread these predators are on the different islands. Burrow-nesting species are particularly vulnerable to rats, and species such as Manx Shearwater only have a tenuous foothold in the islands. Evidence from other islands has shown that removal of predators leads to an increase in breeding seabirds. For example, rats were eradicated through a community program on St Agnes and Gugh on the Isles of Scilly in 2013. The following year both Storm Petrel and Manx Shearwater bred and numbers have increased since. Similarly, both Black and Brown Rats were eliminated from Lundy in the Bristol Channel and, since the island was declared rat free in 2006, Puffins increased from 13 birds in 2001 to 375 in 2019, while the population of Manx Shearwaters rose from 297 pairs to 5,504, according to a study led by the RSPB. Black Rats were eradicated from the Shiantis and were officially declared rat-free in March 2018. Later that year, a Storm Petrel was heard for the first time.

The long-term priority should be that the Bailiwick's main offshore seabird colonies, at least, would be rat and non-native mammalian predator free.

This aim would need to be achieved in stages, and consultation with an appropriate pest control company experienced with rat eradications from islands will be essential. Undertaking surveys to determine where rats are present and installing the necessary biosecurity measures to maintain the status of any island found to be rat-free would be a first priority. On islands with multiple stakeholders, community support is essential given the biosecurity measures that are required.

The islands in the two Guernsey and Herm-based Ramsar sites would also be a priority as the number of stakeholders will be much lower than on, for example, Sark. Eradication would be possible on offshore islands, such as Jethou, but some of the islands that are accessible at low tide would need annual measures put in place to keep the islands rat free. Herm is a possibility but would be complicated given the large amount of marine traffic, people and freight that passes through the island. Initial predator reduction programs might be better in the short-term until the necessary community support and resources are available.

Sark has a population of Black Rats and while of Least Concern globally, they are almost unique to the British Isles as both the Shiantis and Lundy populations have been eradicated to protect seabirds. The status in the mainland UK is uncertain as no recent surveys have been carried out, but it is likely to be extinct. Being a non-native, it is not assessed for the UK Red List and therefore is not a priority species. They are considered vermin in Sark (Traps (Sark) Ordinance, 2013).

8.5 Recommendations

8.5.1 Data storage and checking

The national seabird database needs checking against data held locally, and updating with more detailed count data where available.

8.5.2 Monitoring of breeding populations

- Ensuring continuity by taking part in the national censuses is a high priority.
- Additional censuses in between the national censuses would be highly desirable and need to be developed as part of a wider Ramsar monitoring strategy, which could also be extended to areas outside the boundaries of the two Ramsar sites in Guernsey. Ideally this would be

annual and methods would need to be consistent with previous censuses and with the methods used in the Seabird Monitoring Handbook (Walsh et al. 2005).

- A coordinated Manx Shearwater survey in conjunction with Sark and Alderney would establish a useful baseline. This could use acoustic recorders to identify possible breeding areas, followed up with burrow surveys.
- Ideally annual breeding success data should be collected using the methodology in Walsh et al. (2005).
- Annual reports on the data collection and a 6-year review document, with plans for the next 6-year period should be produced.
- Data should be held centrally, ideally at the Guernsey Biological Records Centre.
- A review of the current seabird ringing, with the aim of maximising the use of the data that comes from it, would help to ensure the best available data for monitoring the Ramsar sites. The feasibility of additional colour-ringing and follow up observation studies should be assessed for each of the key seabird species to provide data on survival rates, immigration and emigration to better understand the underlying demographic causes of the observed population change. Analysis of existing gull colour-ringing data to estimate annual survival would inform the design of any new studies.

8.5.3 Non-breeding seabirds

- Undertake an initial baseline survey of Balearic Shearwater using aerial surveys of Bailiwick waters to better understand the spatial and temporal use of Guernsey's territorial waters by this Critically Endangered species.
- An initial project to collate and curate sea watch data, with the data being logged at the Guernsey Biological Records Centre.

8.5.4 Monitoring of non-native invasive species

- Undertake, as part of any Ramsar monitoring plan, periodic monitoring of the non-native mammalian predators of seabirds (rats, ferrets and cats). This would involve a number of methods which would include traditional methods such as camera traps, hair tubes, chew sticks, but also acoustic detectors for rats.
- Rat eradications would be desirable on some islands and islets but it is recognised that these will be difficult and expensive to carry out. Targeted reduction programs using poisoned baits in the early spring before the breeding seabirds return could be used to preserve important colonies. This has, for example, reduced rat predation of tern eggs in a colony in Alderney. Examples include Lihou, some of the small islets that are exposed at low tide off Herm (e.g. Hermetier, Le Plat Houmet) and Brehon Tower, if rats are found to be present there.

Table 8.2 Numbers of breeding seabirds in the Bailiwick of Guernsey from Seabird 2000, the most recent published seabird census, together with the national coastal and inland population from the same survey, and the biogeographic population (Mitchell *et al.* 2000)

Species	Guernsey	Herm	Sark	Alderney	Bailiwick Total (max)	Guernsey and Herm Total (max)	Great Britain, IOM and Channel Islands total	Biogeographic population	Min	Max	>1% of national population (Bailiwick)	>1% of biogeographic population (Bailiwick)	>1% of national population (Guernsey + Herm)	>1% of biogeographic population (Guernsey + Herm)
Northern Fulmar	29	33	41	32	135	62	505,073	Atlantic	2,700,000	4,100,000				
Manx Shearwater	0	0	0	0	0	0	299,722	World	340,000	410,000				
Storm Petrel	0	0	0	3,000	3,000	0	25,710	Atlantic	300,000		11.7			
Northern Gannet	0	0	0	8,686	8,686	0	226,553	World	390,000		3.8	2.2		
Great Cormorant	16	34	0	15	65	50	9,133	<i>carbo</i> subspecies	52,000	53,000				
European Shag	80	245	159	223	707	325	28,880	NE Atlantic <i>aristotelis</i>	66,000	83,000	2.4	1.1	1.1	
LBB Gull	71	38	511	1,176	1,796	109	113,808	<i>graesili</i>	179,000	179,000	1.6	1.0		
Herring Gull	923	309	843	182	2,257	1,232	143,656	NW Europe & Iceland / W Europe	705,000	799,000	1.6			
Great Black-backed Gull	57	90	52	13	212	147	17,470	Europe (excluding Russia)	100,000	110,000	1.2			
Black-legged Kittiwake	0	0	0	0	0	0	379,895	N Atlantic (<i>tridactyla</i>)	2,500,000	3,000,000				
Common Tern	0	0	0	32	32	0	12,012	Europe (<i>hirundo</i>)	220,000	340,000				
Common Guillemot (ind)	0	130-150	257-327	60	537	150	1,421,376	N Atlantic	2,800,000	2,900,000				
Razorbill(ind)	0	43	45	14	102	43	188,641	NW Europe <i>islandica</i>	530,000	530,000				
Atlantic Puffin (ind)	0	21	4–22	221	264	21	581,110	Atlantic	5,500,000	6,600,000				

9. THE WETLAND BIRD SURVEY (WeBS)

9.1 Introduction

The Wetland Bird Survey (WeBS) aims to monitor all non-breeding waterbirds in the UK in order to provide the principal data on which the conservation of their populations is based. To this end, WeBS has three main objectives:

- to assess the size of non-breeding waterbird populations in the UK
- to assess trends in their numbers and distribution
- to assess the importance of individual sites for waterbirds

These results also form the basis for informed decision-making by conservation bodies, planners and developers and contribute to the sustainable and wise use and management of wetlands and their dependent waterbirds. The data and the WeBS Annual Report (Frost *et al.* 2021) also fulfil some of the objectives of the Conventions and Directives listed above. WeBS data contribute to the International Waterbirds Census (IWC) run by Wetlands International to assist their function of coordinating and reporting upon waterbird status at an international flyway scale.

WeBS and its predecessor schemes - the National Waterbird Census (NWC) and the Birds of Estuaries Enquiry (BoEE) - have been monitoring the UK's waterbirds for 75 years. The Bailiwick of Guernsey and Jersey have contributed to these schemes since the late 1970s.

WeBS Core Counts are carried out at a wide variety of wetlands throughout the UK; synchronised counts are conducted once per month, particularly from September to March. WeBS is a partnership scheme of the British Trust for Ornithology (BTO), Royal Society for the Protection of Birds (RSPB) and the Joint Nature Conservation Committee (JNCC) (the last on behalf of the statutory nature conservation bodies: Natural England (NE), Natural Resources Wales (NRW) and NatureScot (previously Scottish Natural Heritage, SNH) and the Department of Agriculture, Environment and Rural Affairs, Northern Ireland), in association with Wildfowl & Wetlands Trust (WWT). In the Republic of Ireland, The Irish Wetland Bird Survey (I-WeBS) was launched in 1994 as a joint partnership between BirdWatch Ireland, National Parks and Wildlife Service of Dúchas, The Heritage Service of the Department of Environment and Local Government (Ireland), and WWT, with additional funding and support from the Heritage Council and WWF UK (World Wide Fund for Nature).

WeBS organises two primary count schemes: the WeBS Core Counts scheme and WeBS Low Tide. The Core Counts scheme is the national non-breeding waterbird monitoring scheme. WeBS Core Count methodology is based on monthly counts of waterbirds at wetland sites on predetermined dates. Larger sites, including the majority of estuaries and sizable inland sites, are subdivided for the purpose of recording numbers of waterbirds into manageable "count sectors". WeBS Low Tide counts follow a similar methodology to the Core Counts but are restricted to estuarine sites on a six-year rolling cycle the aim of which is to quantify within-site waterbird distributions rather than monitor abundance. WeBS also lends support to the separately funded Non-Estuarine Waterbird Survey (NEWS) which aims to supplement the WeBS Core Count scheme for the purpose of obtaining national population estimates, with survey coverage of the substantial amount of open coast not already monitored by Core Counts. NEWS, an intermittent survey following an approximate nine year cycle, is based on a single mid-winter visit to randomly prioritised stretches of open coast. Mention should also be made of the Winter Gull Survey (WinGS), another independently funded, intermittent survey, following an approximate ten-year cycle used to generate population estimates of gulls through a combination of gull roost counts at key sites and randomised survey squares across the wider countryside.

It is the WeBS Core Count scheme that has relevance to the current report.

Most waterbird species occur in large numbers in the British Isles during winter; some are residents with numbers boosted during winter, while others are solely winter visitors. Some species occur primarily as passage migrants or even just as summer visitors. Although WeBS counts focus primarily on winter months, surveys are carried out year-round.

Counts are made at all wetland habitats used by waterbirds, including lakes, lochs/loughs, ponds, reservoirs, gravel pits, rivers, freshwater marshes, canals, sections of open coast and estuaries. A given WeBS site may be counted as a single unit or be subdivided into manageable count sectors with multi-sector sites undertaken by teams of mainly volunteer counters familiar with the species involved. Count teams are coordinated at the site level to minimise the risk of double counting caused by bird movements during the counting period, allowing sector level counts to be summed to give a robust estimation of waterbird numbers across the entire site. Counts are also synchronised at the national level through the issue of 'priority dates' to minimise the risk of double counting through bird movements between sites.

Numbers of all waterbird species, as defined by Wetlands International, are recorded. This includes geese, swans, ducks, divers, grebes, cormorants, herons, Spoonbill, rails, cranes, waders, terns, gulls and Kingfisher. Under WeBS, observers are expected to count all species although counts of gulls and terns are optional. This was not always the case with various species groups or individual species being added over time:

- Wildfowl from inception of NWC with consistent coverage of most major sites since 1966/67
- Waders from inception of BoEE with consistent coverage of most major sites since 1974/75.
- Additional species added prior to inception of WeBS, (i.e. Great Crested Grebe and Coot in 1982/83, Little Grebe in 1985/86, Cormorant in 1986/87). Data from the first two years following their inclusion have generally been omitted from broadscale indices, as initial take-up by counters appears to have been incomplete leading to step changes.
- Under WeBS, all remaining groups/species of waterbird were incorporated from 1993/94.

The timetable for inclusion in the Guernsey counts does not align completely with the above and so winter of inclusion has been assessed on an individual species basis.

Most waterbirds are readily visible and with one exception, Snipe, this includes all the species recorded in sufficient numbers to support the analyses undertaken. To ensure consistency of approach, observers are instructed to record only birds seen or heard. Counts suspected to be gross under-estimates of the true number of non-secretive species present are noted, for example a large flock of roosting waders only partially counted before being flushed by a predator.

When calculating the various metrics, counts flagged as undercounts often need to be treated differently to 'complete' counts. While the observers themselves indicate whether a count on a given sector is an undercount it is also important to identify undercounts at the site level where not all sectors of a multi-sector site have been visited. This is determined on a by-species basis by considering the proportion of the site total for the species in question that each uncounted sector typically supports. This is based on the fifteen nearest complete counts over time while restricting contributing counts to a three month wide window for seasonal perspective. If the summed proportion from all unvisited sectors exceeds 25% that site total is flagged as an undercount.

9.2. Methods

WeBS uses a number of different reporting devices, developed in partnership with and widely used by the relevant conservation bodies of the UK. These are detailed below.

9.2.1 WeBS Indices

Because the same sites are not necessarily covered by WeBS on every month in every year, relative changes in waterbird numbers cannot be determined simply by comparing the total number of birds counted each year. This issue is addressed by using indexing techniques that have been developed to track relative changes in numbers from incomplete data. The 'Underhill index' was specifically developed for waterbird populations (Underhill 1989, Underhill & Prys-Jones 1994 and Kirby et al. 1995).

In brief, for occasions when a particular site has not been visited, an expected count for each species is calculated (imputed) based on the pattern of counts across months, years and other sites. A moving window approach is used during the imputing process. This effectively means that a complete set of counts are available for all years and all months for a sample of sites. For regional, national or other broadscale indices only sites that have an arbitrary 50% or more of possible visits undertaken are used and the underlying assumption is that the pattern of change in numbers across these sites (the index) is representative of the pattern of change in numbers at the regional or country level being considered. WeBS annual index values are normally expressed relative to the most recent year, which takes an arbitrary value of 100. In the case of Guernsey relatively small numbers underpin the trends compared to the indices reported for the UK and its constituent countries. Accordingly, in order to maintain transparency the trend plots for waterbirds in this report have not been rescaled - the Y-axis shows the mean winter count.

Having used the Underhill approach to impute true missing counts and assessing undercounts should be treated as missing data or accepted, a Generalised Additive Model (GAM) is used to fit a smoothed trend through the WeBS index. The smoothed trends are less influenced by years of abnormally high or low numbers and sampling 'noise' than are the raw index values. This makes them especially useful when assessing changes through time.

With few exceptions annual indices for waders are based on count data from the months of November to March, inclusive and those for other waterbirds are based on count data from the months of September to March, inclusive. The exceptions include summer and passage species none of which feature in the Guernsey analyses.

9.2.2 WeBS Alerts

The WeBS Alerts system provides a standardised method of quantifying changes in numbers of waterbirds at a variety of spatial and temporal scales (Woodward *et al.* 2019). WeBS Alerts are used to assess the status of species on sites in the UK which are designated due to their conservation value for waterbirds. Species that have undergone major declines in numbers are flagged, by the issuing of an Alert. Alerts status is also assessed for the Waterbird Assemblage for a site where this is a notified feature.

WeBS Alerts are based on smoothed site-level trends, drawn from the index data. Full details pertaining to the use of GAMs for the calculation of annual waterbird indices and the fitting of smoothed trend curves by the WeBS Alert system are available in Atkinson et al. (2006). WeBS Alert status is assessed as percentage change on the smoothed abundance trend for short- (5yr) medium- (10yr) and long- (25yr) terms.

Declines in abundance of at least 25% but below 50% are flagged as medium-Alerts and declines of 50% or greater are flagged as high-Alerts. In the UK, Alerts are only issued for designated SPA features and while percentage change is calculated for non-features correspondingly large declines do not constitute a formal WeBS Alert and are referenced as moderate- or substantial declines. Here we use the term Alerts for all species recorded consistently in sufficient numbers to support trend analyses. Note the corresponding percentage change required to balance the numbers to their former level following a decline are likewise termed moderate (at least 33% but below 100%) and substantial (100% or greater) increases. The percentage change in trend abundance is calculated with reference to the penultimate winter in the available time series (hereafter reference winter) chosen to avoid using the less reliable end-points of the smoothed abundance trend. By way of example, for the short-term percentage change relating to the reference winter 2017/18, the change between winter 2012/13 and 2017/18 and is calculated as:

$$\text{Percentage change} = 100 \times ((W17/18 - W12/13) / W12/13)$$

where W17/18 is the trend value for winter 2017/18 and W12/13 is the trend value for winter 2012/13.

In order to place the smoothed trends for Guernsey into context they are compared with those for the Channel Islands as a whole to determine whether any declines (or increases) are following or departing from the regional trend (Banks & Austin 2004). The comparisons use a logistic regression model with a binomial error term. The resulting plots depict the percentage contribution of numbers from Guernsey to numbers across the region. The associated confidence limits represent both variation in this proportion between months in a given year and the underlying sample size. This is based on the winter period as is routinely used for all WeBS reporting (Nov-Mar for waders and Sep-Mar for other species). Only data from months where counts across the site have been assessed as complete are used. In general, if waterbird numbers of a given species follow those of the species across the region then the proportion contribution of numbers from Guernsey would remain constant, whereas deviation from a constant proportion would indicate that the species is faring either better or worse than would be expected from the broader region. This holds regardless of whether abundance on the site is increasing, stable or declining and so both the trend in abundance and trend in proportional contribution to the broader picture need to be considered together to come to a plausible explanation about why alerts may have been triggered.

Alerts are intended to identify where issues may exist that may require further investigation and research, and may warrant precautionary measures to be taken in the meantime. Importantly, the calculations of percentage change in abundance and the flagging of medium- and high-Alerts provides evidence for notable declines in abundance on a site but does not in itself indicate what pressures may be driving those declines. However, comparison of site trends with broader scale trends and between trends of other species on the site with similar habitat or other resource requirements or sensitivities can help elucidate whether declines of a given feature are likely being driven primarily by site-level pressures or part of a broader pattern and this in turn may guide the urgency with which further research is undertaken or whether site-level precautionary measures may be warranted.

Consequently:

- where a decline on a site reflects a decline across the broader region it is likely that the observed site trend is being driven by a broadly acting pressure, such as climate change, rather than local pressures affecting that site alone, such as disturbance or habitat degradation.
- where a decline on a site is more substantial than that across the region as a whole, this may suggest that the observed site trend is being, at least in part, driven by local pressures.

- where a decline on a site is less marked than the decline across the broader scale, this suggests that relatively favourable conditions on that site are off-setting declines due to broad scale pressures and are helping to buffer those broader declines.
- where an increase on a site is less marked than that across the broader region, this suggests that either the site is already at carrying capacity for the species in question or, if historically it supported greater numbers, that the quality of the site to that species has diminished.
- where an increase on a site is greater than that across the broader region, this suggests that trends on that site are, at least in part, driving the broader scale increase.

9.2.3 Wintering Waterbird indicators

For each of the UK, England and Scotland, WeBS supplies Defra or the country agencies with an annual update to the 'Wintering Waterbird Indicator'. The Wintering Waterbird Indicator is a multi-species index which is calculated for each year in the time series as the geometric mean of the individual index values for each species having rescaled each species to set the baseline value (that of the first winter in the time series) to one. There is provision to incorporate 'late entry' species into the indicator by rescaling the indices for those species such that the index value for the first available winter takes the current value of the indicator based on those species already incorporated.

9.2.4 Sector level analyses

The Guernsey Shore WeBS site is divided into 10 count sectors. The waterbirds themselves are not evenly distributed across these sectors. By comparing the numbers of each species between sectors, there is scope to identify those areas of particular relevance to each and comparisons of trends on those sectors can inform whether any changes in the overall trends across the site are being driven by changes in particular areas which in turn may indicate where local pressures may be having a negative effect.

The mean of the peak counts from each of five consecutive WeBS reporting years - the 'Five-year Mean Peak' is reported annually for all WeBS sites and is the primary metric used by the country agencies of the UK to determine qualifying waterbird features of protected sites by comparison with international thresholds. Furthermore, Five-year Mean Peaks of all waterbirds (non-native species excluded) are summed to give a minimum estimate of the total number of individual waterbirds a given site supports. To avoid the Five-year Mean Peak being unrealistically reduced by undercounts, those undercounts lower than the mean of the complete counts are excluded. Undercounts higher than the mean of the complete counts are included on the grounds that the resulting mean, while still an underestimate, will be closer to the actual Five-Year Mean Peak had all counts been complete. In the case of multi-sector WeBS sites, sites such as the Guernsey Shore, the Five-year Mean Peak also provides a means of quantifying the relative importance of count sectors within the context of the entire site at a given point in time.

The methodology developed for the WeBS Alerts focusing on site level trends, has since been scaled down and deployed to provide a standardised approach to focusing on trends within multi-sector sites, by considering those for the finest resolution possible, the count sector, and placing these into the context of that for the overall site. This can usefully identify areas on which numbers of a given species are faring better or worse than would be expected compared to the rest of the site. This in turn can focus attention as to possible causes of any observed change.

Accordingly, species trends on the individual count sectors of the Guernsey Shore have been compared with those of the Guernsey Shore itself to quantify those parts of the Guernsey Shore most important to each species and explore how trends in those parts may be diverging from the overall Guernsey Shore trend.

9.3 Results

The Guernsey Shore WeBS site comprises 10 count sectors. Counts have been collated back to the winter of 1978/79. Since then 64 species of waterbird have been recorded during WeBS Core Counts. Of these, 19 species have been recorded annually in sufficient numbers to support further detailed analysis (Table 9.1).

Species	Species code	Time series begins	Notes
Dark-bellied Brent Goose	DB	1993/94	No counts prior to 1993/94
Shelduck	SU	1993/94	Only six pre-1993/94 records
Heron	H.	1978/79	
Little Egret	ET	1995/96	First record in 1995/96
Cormorant	CA	1978/79	
Oystercatcher	OC	1978/79	
Lapwing	L.	1978/79	
Grey Plover	GV	1978/79	
Ringed Plover	RP	1978/79	
Curlew	CU	1978/79	
Turnstone	TT	1978/79	
Sanderling	SS	1978/79	
Dunlin	DN	1978/79	
Snipe	SN	1978/79	
Redshank	RK	1978/79	
Black-headed Gull	BH	1993/94	No counts prior to 1993/94
Great Black-backed Gull	GB	1993/94	No counts prior to 1993/94
Herring Gull	HG	1993/94	No counts prior to 1993/94
Lesser Black-backed Gull	LB	1993/94	

Table 9.1 Waterbird species recorded annually in sufficient numbers to support further detailed analysis

9.3.1. Species trends and alerts

Species trends for the Guernsey Shore were derived for all 19 species listed above (Figure 9.1). To provide context for these trends, the equivalent trends were also generated across the Channel Islands as a whole. Alerts status was calculated for all 19 species (Table 9.2)

Dark-bellied Brent Goose has been recorded consistently since 1993/94 numbers peaking in 2016/17 when over 160 were recorded. The winter index climbed steadily over the same period showing a slight dip over the most recent three winters. Aside from a few exceptional winters, Guernsey has typically supported between roughly 5% and 15% of the Channel Islands wintering population. No Alerts have been triggered for this species.

Shelduck has only been recorded regularly since the turn of the century peaking in 2017/18 at a little below 100. The winter index has been climbing steadily but has dropped sharply over the most recent two winters. Shelduck are rarely recorded elsewhere in the Channel Islands. No Alerts have been triggered for this species.

Grey Heron occur in small numbers along the Guernsey shore, the annual peak count for the Guernsey Shore WeBS site being in the region of 20 to 30 in most winters. The winter index has been in shallow decline since the turn of the century. Guernsey Shore supports roughly 20% to 40% of the

Channel Islands wintering population, possibly increasing slightly in recent winters as numbers decline sharper elsewhere. A medium Alert has been triggered for the medium-term underpinned by the 25% decline in the smoothed winter index over this period. The increase in the percentage of the Channel Islands total supported by Guernsey suggests this is driven by broadscale rather than local pressures.

Little Egret has been recorded annually on Guernsey Shore since the end of the last century and both peak numbers and the winter index had been rising steadily until the past few winters. A peak count of over 90 was obtained in 2015/16. Up until 2007/08 a little below 20% of the Channel Islands winter population was being recorded on Guernsey Shore although since then this has increased and currently it runs at 50% or more. A medium Alert has been triggered for the short-term underpinned by the 33% decline in the smoothed winter index over this. The average percentage of the Channel Islands total supported by Guernsey has been relatively stable over recent winters suggesting this is driven by broadscale rather than local pressures. That said, if the shape decline of the smooth trend persists beyond the most recent winter decline might be of some concern.

Cormorants are recorded in relatively small numbers on Guernsey Shore peak counts typically being in the 20 to 30 range. The winter index climbed slowly through to the start of the century and has been relatively stable prior to a sharp drop in the more recent winter. For most of this period the proportion of the Channel Islands winter population supported by Guernsey had been declining from about 70% down to about half of that, however, this has jumped back up sharply over the past five or six winters indicating that numbers elsewhere have declined much faster. No Alerts have been triggered for this species.

Numbers of **Oystercatcher** recorded by WeBS on Guernsey Shore have remained relatively stable throughout the time series with winter peak numbers typically being in the 600 to 800 range although occasionally topping 1000. That said, there is an indication from the winter index of decline during the latter part of the past decade. Guernsey shore consistently supports between roughly 25% to 30% of the Channel Islands winter population. No Alerts have been triggered for this species.

In most years **Lapwing** are only recorded in small numbers on Guernsey Shore. There are occasional winters when severe winter weather elsewhere may cause an influx. In the past, Guernsey Shore has only held a notable percentage of the Channel Islands winter population in those atypical winters, however, during the most recent decade, although still erratic, this percentage has increased as numbers elsewhere have collapsed. Although high Alerts have been triggered for Lapwing in the medium-term, long-term and since baseline, the erratic nature of occurrence of this species on Guernsey mean that these Alerts need not be considered a case for concern.

Numbers of **Grey Plover** wintering on Guernsey Shore have been declining steadily since peaking at about 250 in the mid-1990s. Over the past few winters no more than about 50 have been recorded for the peak count. This decline is reflected in the winter index. Prior to 2002/03, Guernsey Shore would typically support roughly 20% of the Channel Islands winter population but following a steep decline this has fallen to between 10% and 15%. Aside from the steep decline, the trend for Guernsey Shore appears to be tracking that of the Channel Islands as a whole. High Alerts have been triggered for all terms, underpinned by the continued decline in the smoothed winter index. However, these declines are consistent with those of the Channel Islands and indeed reflect the pattern across the UK and Republic of Ireland and so appear to be following a broadscale decline of this species in general and so unlikely to be a result of local pressures, and therefore are unlikely to respond to local mitigation measures.

Ringed Plover numbers on Guernsey Shore peaked in 1990/91 close to 500 since then they have been falling steadily and recently the annual peak has been a little over 100. The winter index suggests that this is a continuing trend. However, in the context of the Channel Islands, Guernsey is holding up well. Prior to the turn of the century, Guernsey Shore supported between 20% and 30% of the Channel Islands winter population, but following a sharp increase over the first decade of this

century, has supported roughly 60% indicating numbers are falling much more sharply elsewhere. High Alerts have been triggered for Ringed Plover over the long-term and since baseline, and a medium Alert for the short-term underpinned by the continued decline in the smoothed winter index which has recently reached an all-time low. It is unlikely that this decline is being driven by local pressures or would respond positively to local mitigation measures. The decline on Guernsey reflects the pattern seen across the UK and Republic of Ireland as well as the Channel Islands.

Curlew numbers have fluctuated over time peaking in 2013/14 with a count of nearly 300. Although the winter index shows a decline over recent winters the current value appears close to the long-term average. Prior to the most recent decade, Guernsey Shore has supported between 20% and 40% of the Channel Islands winter population but this has jumped to 40-50% during the past seven winters indicating that the decline elsewhere in the Channel Islands has been more severe. Medium Alerts have been triggered for the short- and long-term for Curlew, primarily in response to a very steep decline in the smoothed winter index in the short-term. As numbers are currently more in accord with those recorded through most of the 1990s and 2000s, these Alerts may not be of immediate concern as there is little to suggest that these declines have been driven by local pressures as they are following or bettering the trend for the Channel Islands and reflect the situation across the UK and Republic of Ireland. Nonetheless the situation is worthy of close monitoring over the coming winters given the severity of the recent decline.

Throughout the 1980s and early 1990s peak winter numbers of **Turnstone** were consistently in the 600-800 range and the winter index remained stable. There was a sharp decline in the late 1990s, followed by a decade of relative stability and then further decline more recently. In recent winters counts have only run into the tens of individuals. Although the winter population of Turnstone has been declining over the same timescale throughout the Channel Islands, the decline is more pronounced on Guernsey with a persistent decline in the percentage supported by Guernsey Shore from about 60% in the early 1980s to about 20% in recent winters. A medium Alert has been triggered over the short-term and high Alerts triggered over the medium-term, long-term and since baseline, underpinned by the persistent decline across the time series. Although this does appear to reflect the pattern throughout the UK and Republic of Ireland, given the persistent fall in the percentage of the Channel Islands total it is possible that local pressures are exacerbating the decline. Accordingly, further investigation seeking to identify potential local pressures would be warranted.

Peak counts of **Sanderling** on Guernsey Shore fluctuate winter on winter. Infrequently, the winter peak has exceeded 100 individuals but is generally much lower. The winter index shows a slow decline since it peaked early this century. Nonetheless, the percentage of the Channel Islands winter population has held steady at about 5-10% indicating that the trend is following that of the wider area. Medium Alerts have been triggered over the long-, medium- and short-terms in keeping with the slow decline recently with numbers now falling to those last seen in the mid-1980s and appears to be tracking overall numbers in the Channel Islands rather than being driven by site specific pressures. The pattern is in contrast to the UK and Republic of Ireland where numbers have been increasing recently.

Dunlin numbers on Guernsey Shore have shown a major decline spanning the entire time series. In the early 1980s, winter peaks of over 1,000 individuals were not unusual whereas counts of over 100 individuals have not been recorded during the most recent decade. The winter index continues to fall. The winter index across the Channel Islands shows a similar decline over the same timescale, however, the decline appears to have been sharper on Guernsey, the proportion of the Channel Islands winter population having declined steadily from about 20% in the early 1980s to between 5% and 10% over the most recent decade. Accordingly, high Alerts have been triggered for the long-term and since baseline, and medium Alerts for the medium- and short-terms. Given the more rapid decline on Guernsey compared with the rest of the Channel Islands it might be expected that numbers will continue to fall. Although it could be argued that being a species where individuals prefer to form into reasonable sized flocks the ongoing decline may be in part driven by the

remaining small numbers leaving to seek more substantial flocks elsewhere, back in the 1980s and 1990s when the decline was well underway, numbers were more than sufficient for individuals to form into reasonably sized flocks and were already declining more rapidly than in the wider area, suggesting that local pressures may well have been driving the overall pattern.

Snipe numbers on Guernsey Shore fluctuate considerably. The winter index shows no trend and as a cryptic species, not well suited to WeBS methodology this is not surprising. That said, the numbers recorded on Guernsey Shore may represent a high percentage of the numbers recorded throughout the Channel Islands, although with considerable monthly and annual variation. A medium Alert has been triggered for the period since baseline. However, given the unreliability in monitoring this species through the WeBS Core Count methodology, and the fact that this Alert is underpinned by a decline from atypically high numbers during the baseline winter, this Alert gives little cause for concern.

Although never recorded in large numbers, the number of **Redshanks** on Guernsey Shore have declined markedly over the time series. During the 1980s peak counts of between 80 and 100 individuals were recorded most winters. This had fallen by half by the turn of the century and has continued to fall ever since. The winter index suggests this will continue to be the case as annual peaks approach single figures. The winter index across the Channel Islands shows a similar decline over the same timescale, however, the decline appears to have been steeper on Guernsey, the proportion of the Channel Islands winter population having declined steadily from about 20% in the early 1980s, a steep fall in between 1997/98 and 1998/99 dropping to below 10% in recent winters. Accordingly, high Alerts have been triggered for the long-term and since baseline, and medium Alerts for the medium- and short-terms. Given the steeper decline on Guernsey in relation to the Channel Islands as a whole, local pressures may be exacerbating the decline on Guernsey. Although now two decades in the past, the steep decrease in the percentage of the Channel Islands wintering population supported by Guernsey may be worthy of investigation, especially if the wintering population includes Guernsey breeding birds.

Black-headed Gull numbers have fallen over the time series although they have been relatively stable for the most recent decade with winter peak counts in the 400-500 range. The winter index shows a very shallow decline. During the 1990s, between 70% and 80% of the species recorded in the Channel Islands were supported by the Guernsey Shore. This dropped by more than half between 2003/04 and 2004/05, remaining below 50% until the most recent few winters and has now returned to its former level, primarily due to lower numbers being recorded elsewhere. A medium Alert has been triggered for the medium-term, and a high Alert for since baseline. Notwithstanding the slow decline in the winter index, these particular Alerts are underpinned by the percentage change with reference to two short periods where especially high counts of this species were recorded and as such may not be of particular concern.

Numbers of **Great Black-backed Gull** recorded on Guernsey Shore have fluctuated markedly over the time series with peak counts of over 600 individuals in some winters and as low 200 in others. Nonetheless, the winter index is reasonably tight and, having peaked in 2003/04, shows a steady decline until the most recent winter when there is a sharp drop. The Channel Islands winter population shows a similar trajectory which is expected as an increasing majority of that population is supported by Guernsey Shore having risen from a low of 60% in 1999/00 to near 100% over the most recent five winters. Although medium Alerts have been triggered for the medium-term this is underpinned by the sharp decline in the winter index latterly, itself due to the influence of uncharacteristically low numbers being recorded in the most recent winter. If the counts remain at this low level over the winters that follow then it may well be that local pressures have come into play and further investigation as to what those are would be warranted.

Numbers of **Herring Gull** recorded on Guernsey Shore are relatively high compared to the other gulls with recent winter peak counts exceeding 3,000 since 2006/07, although with considerable fluctuation from one winter to the next. The winter index remained stable throughout the 1990s

and up until 2006/07 when there was a marked increase. While the underlying index fluctuates thereafter, the smoothed trend has remained relatively stable up until the most recent winter in the time series driven by a substantial crash in numbers recorded in 2019/20. Guernsey shore has always supported the majority of the Channel Islands winter population (at least 80%), and this has been climbing over the most recent decade. Although medium Alerts have been triggered for the medium- and short-terms, as was the case for Great Black-backed Gull, these are underpinned by the sharp decline in the winter index latterly itself due to the influence of uncharacteristically low numbers being recorded in the most recent winter. If the counts remain at this low level over the winters that follow then it may well be that local pressures have come into play and further investigation as to what those are would be warranted.

Lesser Black-backed Gull numbers can fluctuate markedly between years. Typically, the winter peak count is in the order of 100-500 but topped 1,200 in 2013/14. The winter index shows a gradual increase, peaking in 2013/14, followed by a steep decline back to its lower levels. Over time, Guernsey Shore has supported roughly 40% of the Channel Islands population although this varies considerably from month to month within each winter. High Alerts have been triggered for the medium- and short-terms underpinned by the steep decline in numbers during the most recent decade. The high degree of variability in the percentage of the Channel Islands population supported by Guernsey precludes understanding of whether the declines are following the wider region potentially due to local pressures.

The **Waterbird Assemblage** in Figure 9.2 is derived from the summation of the annual peak counts across all species equating to a minimum estimate of the number of individual waterbirds occurring on the site. All naturally occurring species are included, except for naturalised non-natives. The Waterbird Assemblage, excluding gulls, is a regular notified feature of UK protected sites.

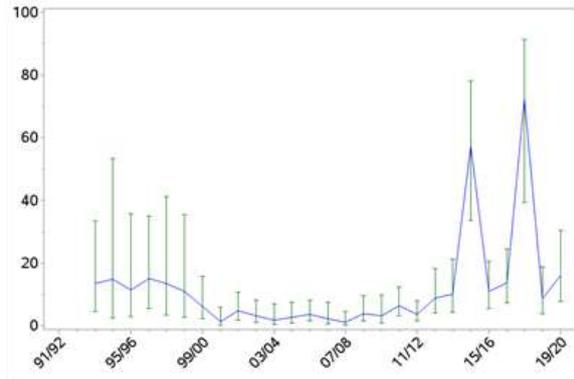
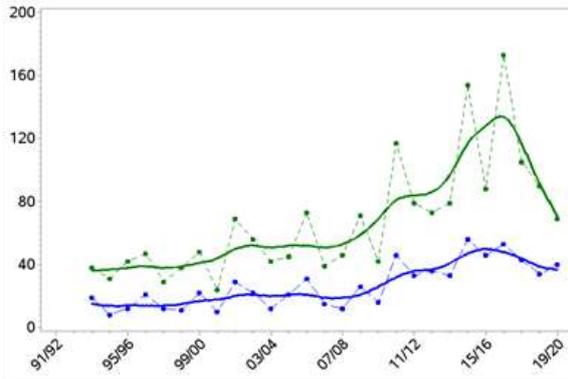
The Waterbird Assemblage, excluding gulls for the Guernsey Shore shows a fall from in excess of 3000 individuals recorded throughout the 1980s and early 1990s to fewer than 2000 individuals in recent winters, a step-fall in numbers occurring in the mid-1990s. Consequently a medium Alert has been triggered for the long-term and a high Alert triggered for the period since baseline.

The Waterbird Assemblage, including gulls, has fallen sharply in recent winters, mirroring the trends in the four most numerous gull species (detailed above) due to the relatively high contribution of gull numbers in comparison to the other waterbird species. Accordingly a medium-term medium Alert has been triggered. However, the value remains over 40% higher than the baseline.

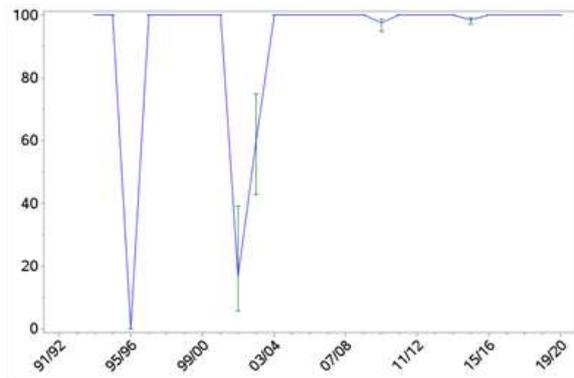
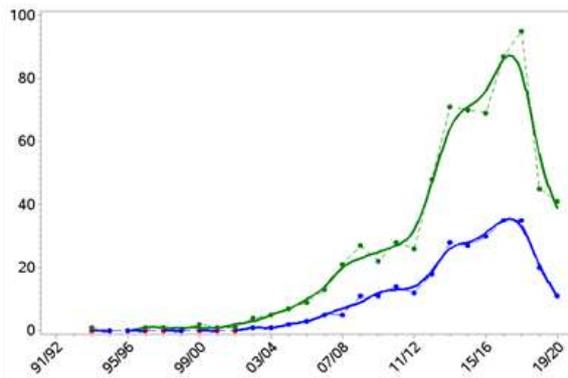
Guernsey Shore trend

Guernsey Shore as percentage of Channel Islands

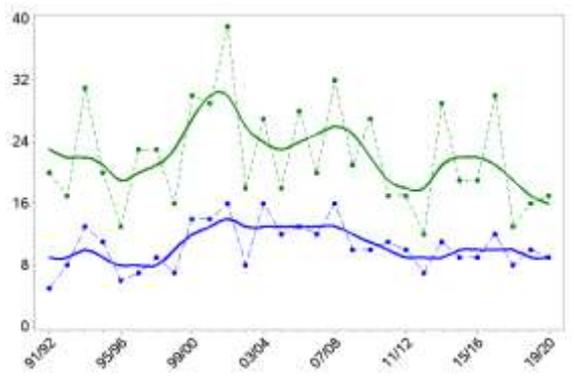
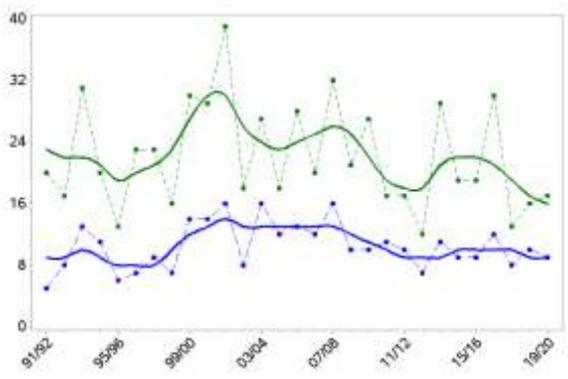
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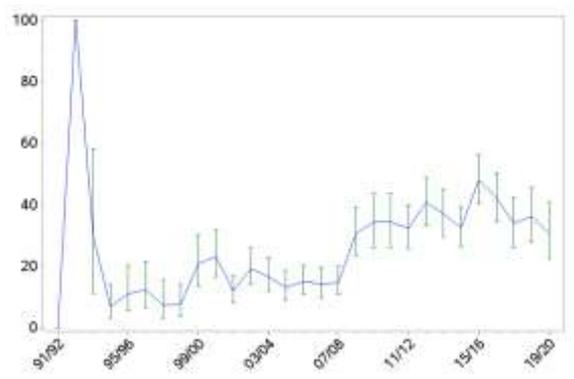
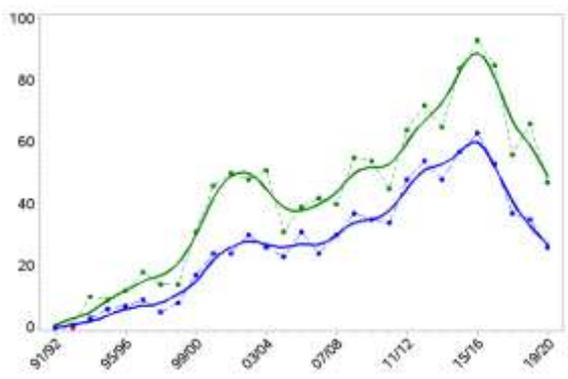
Shelduck



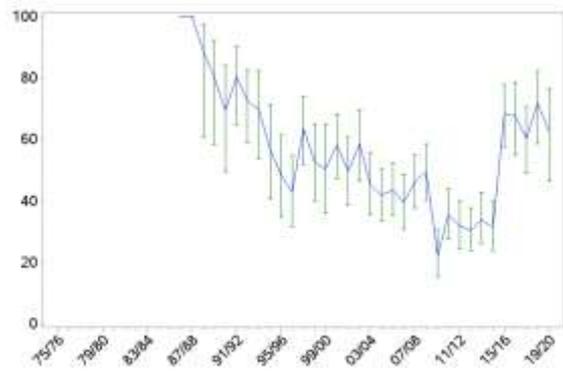
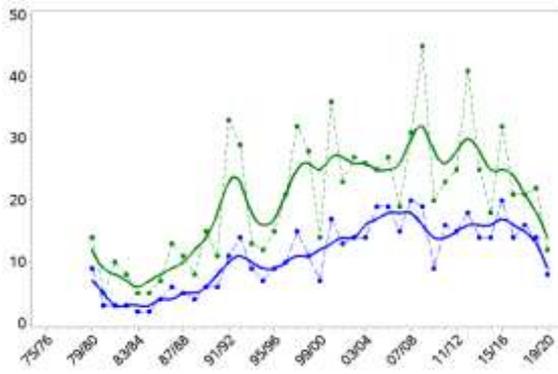
Grey Heron



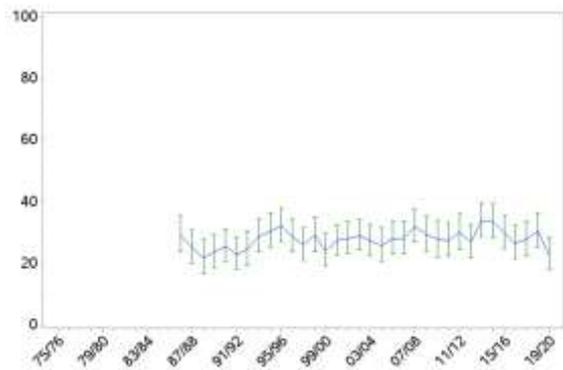
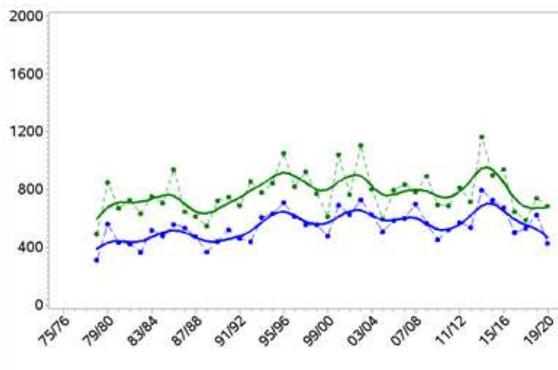
Little Egret



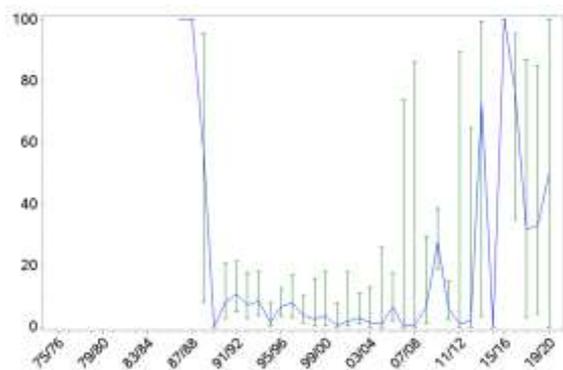
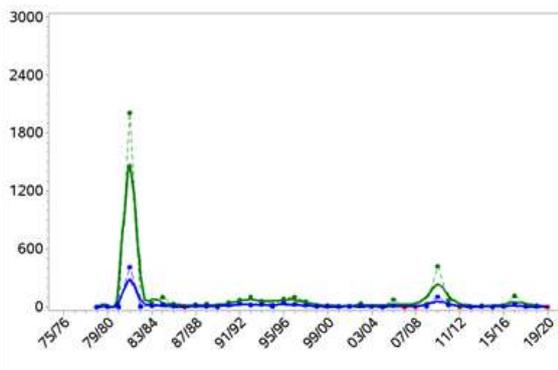
Cormorant



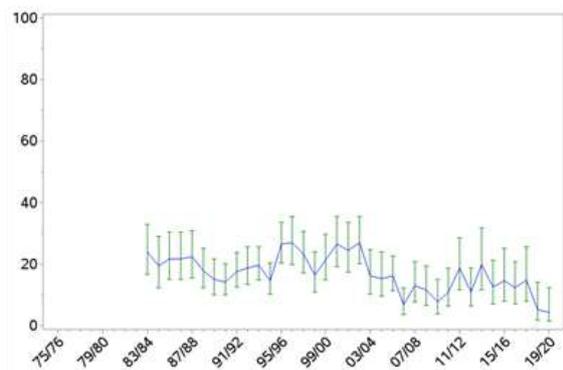
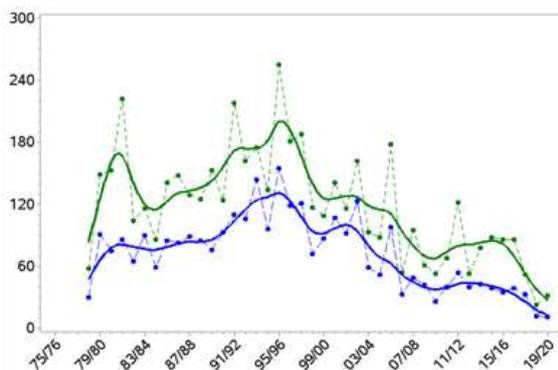
Oystercatcher



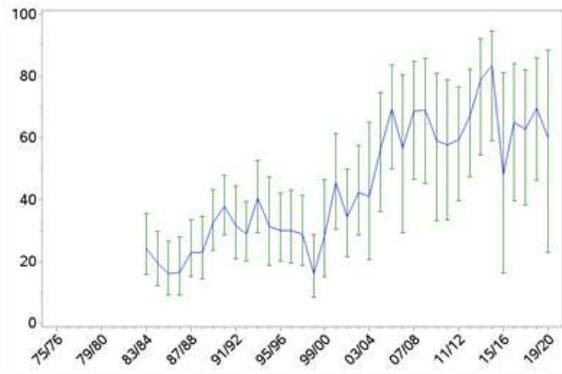
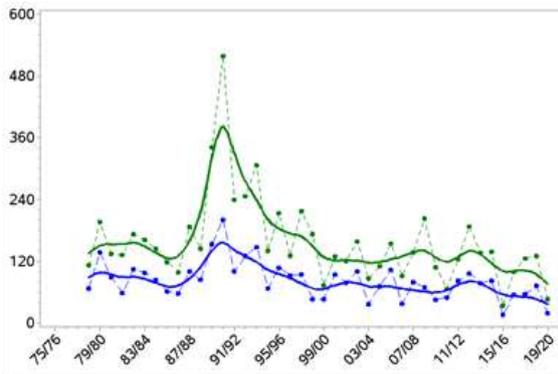
Lapwing



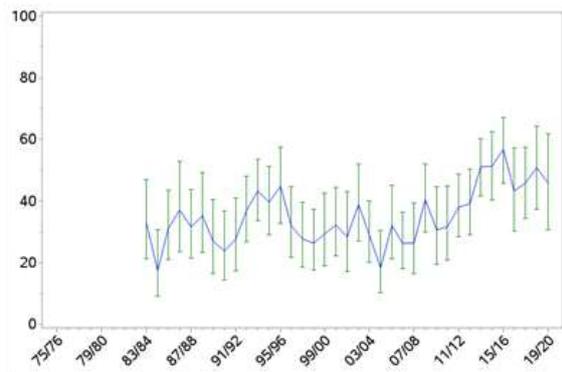
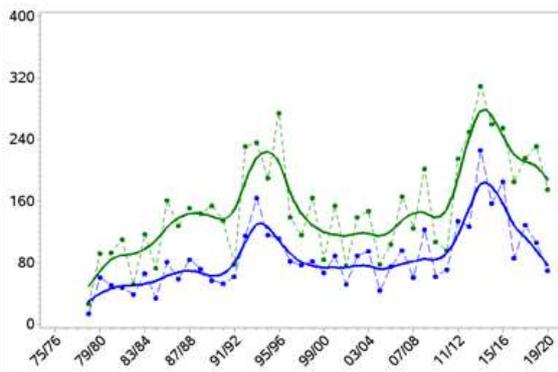
Grey Plover



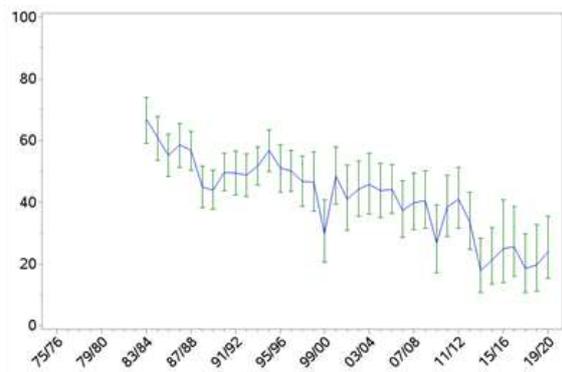
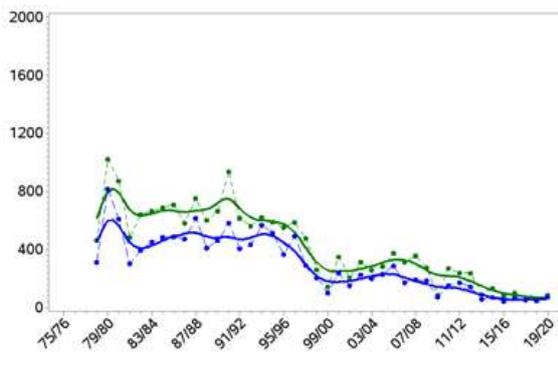
Ringed Plover



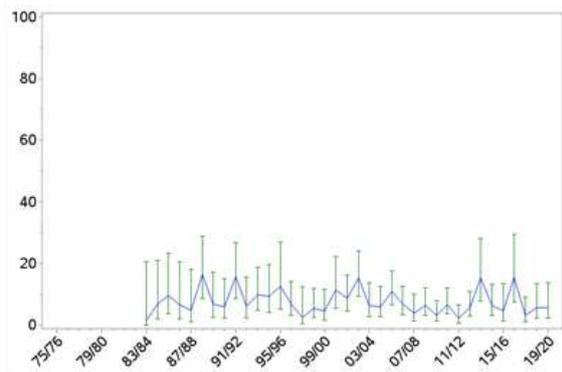
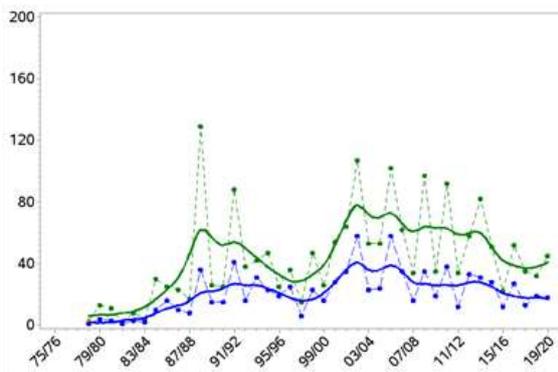
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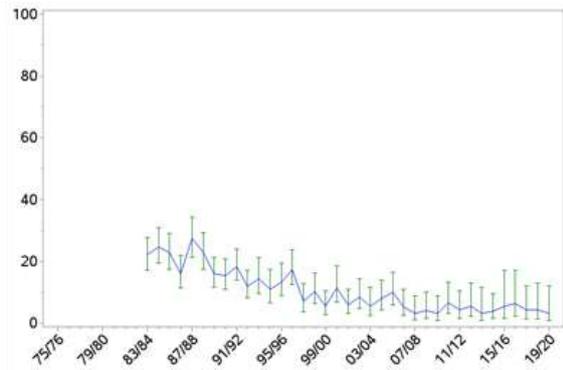
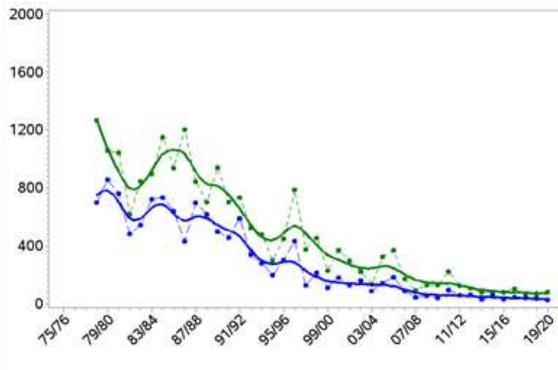
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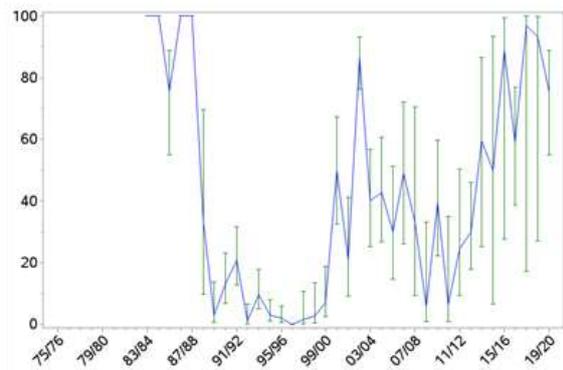
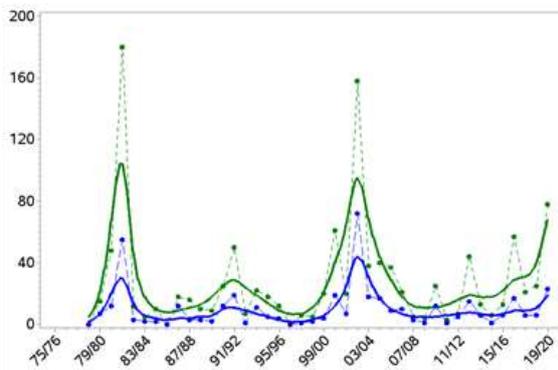
Sanderling



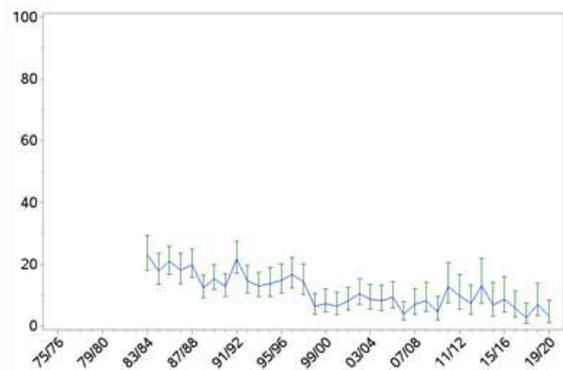
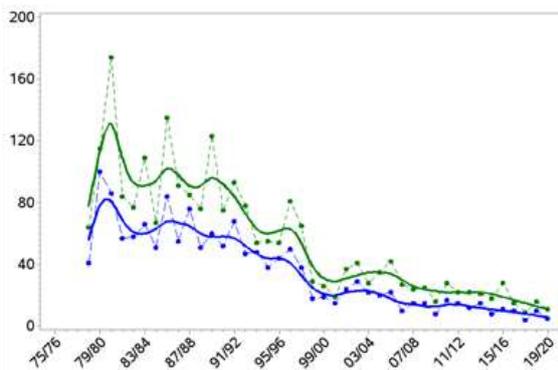
Dunlin



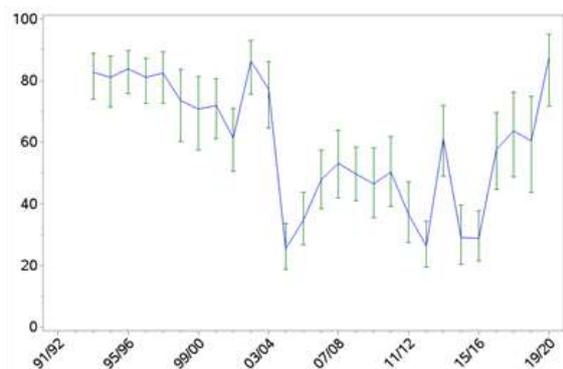
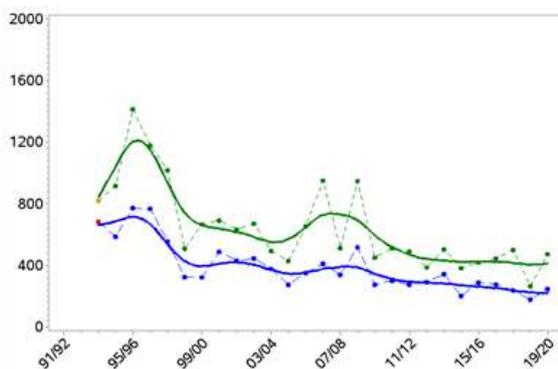
Snipe



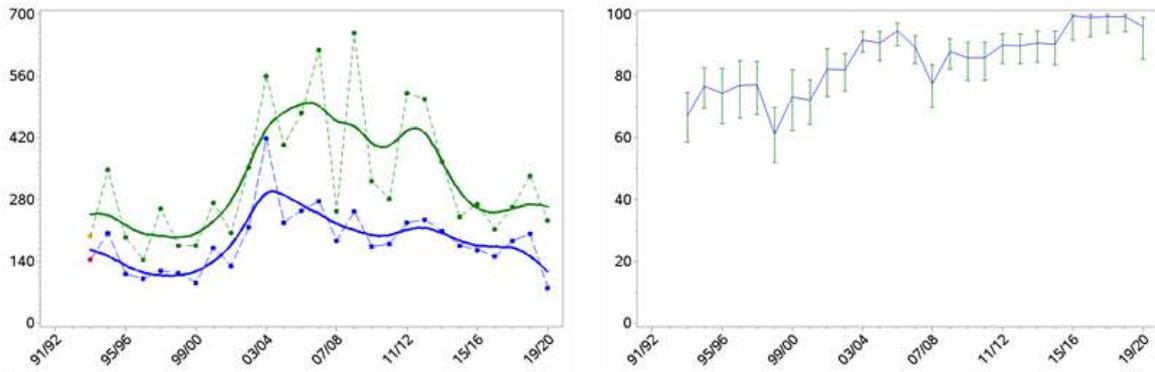
Redshank



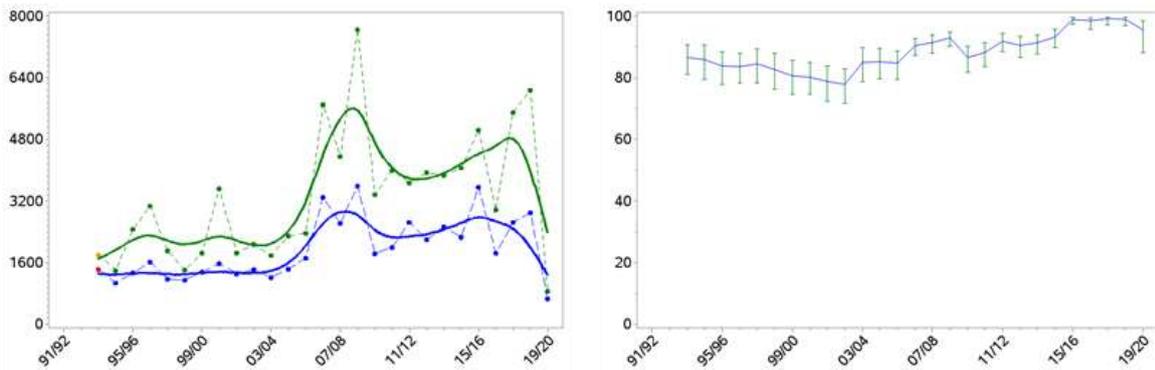
Black-headed Gull



Great Black-backed Gull



Herring Gull



Lesser Black-backed Gull

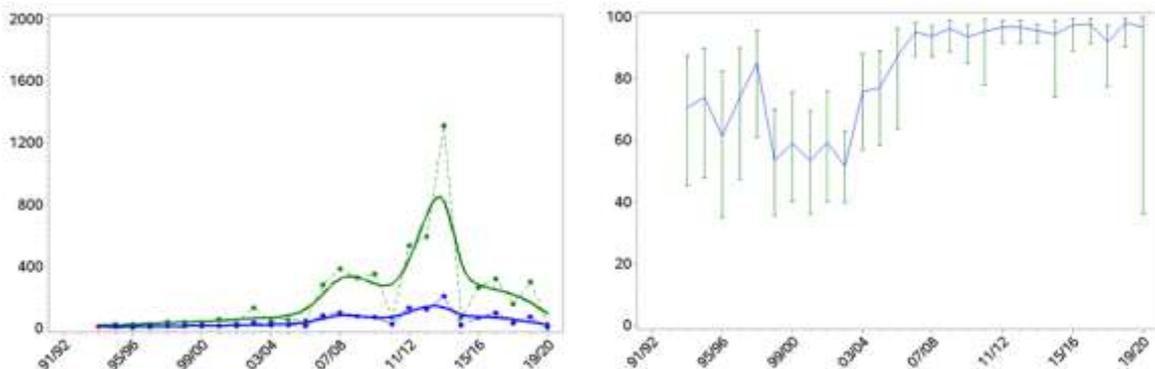


Figure 9.1 **LEFT:** Wintering waterbird indices and trends for Guernsey Shore. Blue: mean winter count; Green: winter peak count. Rescaling the mean winter count such that the value in the most recent winter=100 would correspond to the WeBS index for Guernsey. Alerts are triggered when the percentage change on the mean winter smoothed trend (blue line) declines by 25% (medium Alerts) or 50% (high Alerts) over the time period being considered. **RIGHT:** Percentage of Channel Islands total supported by Guernsey Shore. These plots along with mean winter trends for the Channel Islands as a whole are available in the Excel file "WeBS Site and Sector trends.xlsx" provided with the supporting material.

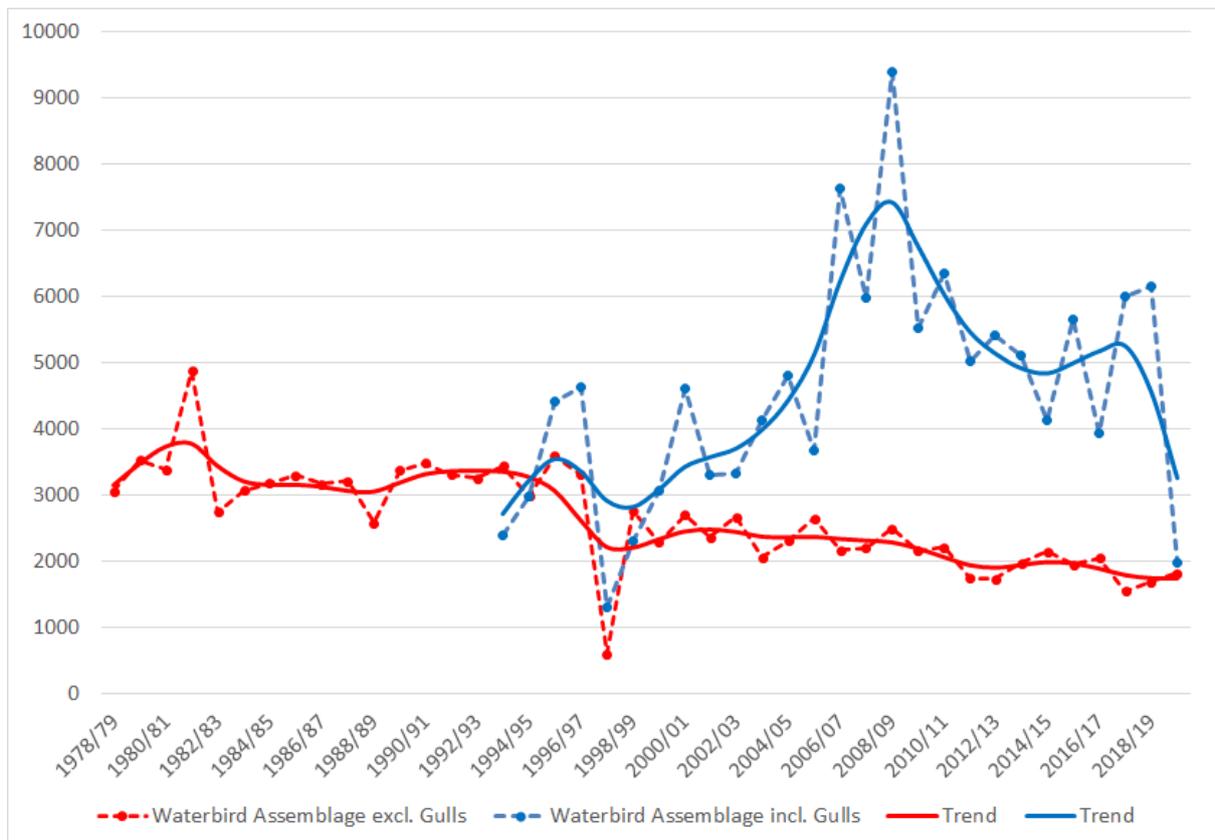


Figure 9.2 Waterbird Assemblage (sum of annual peak counts across all naturally occurring species) for Guernsey Shore. Red: Waterbird Assemblage excluding gulls; Blue: Waterbird Assemblage including gulls. Alerts are calculated on the smoothed trends represented by the solid line.

	Short	Medium	Long	Since Baseline
Dark-bellied Brent Goose	-5	88	-	875
Shelduck	-19	110	-	-
Grey Heron	0	-25	10	13
Little Egret	-32	6	1100	1100
Cormorant	-19	-19	30	160
Oystercatcher	-24	-7	-8	14
Lapwing	67	-81	-78	-91
Grey Plover	-58	-55	-85	-78
Ringed Plover	-38	-23	-60	-51
Curlew	-47	13	-27	85
Turnstone	-35	-65	-89	-90
Sanderling	-36	-33	-31	500
Dunlin	-27	-45	-88	-95
Snipe	57	120	57	-48
Redshank	-42	-46	-85	-91
Black-headed Gull	-20	-41	-	-67
Great Black-backed Gull	-26	-28	-	-1
Herring Gull	-19	-30	-	53
Lesser Black-backed Gull	-69	-64	-	63
Waterbird Assemblage (excl. gulls)	10	-24	-48	-50
Waterbird Assemblage (incl. gulls)	-7	-39	-	41

Key to Terminology:

Comparison terms

short-term = most recent five-year percentage change 2013/14 -2018/19

medium-term = most recent ten-year percentage change 2008/09 -2018/19

long-term = most recent twenty-five-year percentage change 1993/94 -2018/19

since baseline = percentage change to 2018/19 since first available year for comparison

Alerts status



high Alert = decline of at least 50% over term

medium Alert = decline of at least 25% but less than 50% over term

"no" change = decline of less than 25% to increase of less than 33% over term

medium increase = increase of at least 33% but less than 100% (that required to mitigate a previous medium Alert)

high increase = increase of at least 100% (that required to mitigate a previous high Alert)

comparison unavailable (outwith data range or start year has value of zero)

Table 9.2. Alerts status of species for the Guernsey Shore WeBS site over the short, median and long-term and since the baseline. Uses the approach adopted by WeBS for reporting the status of waterbird features on protected sites of the UK.

9.3.2 Wintering Waterbird Indicator for Guernsey

The Wintering Waterbird Indicator produced for Guernsey comprised three components; for Waterbirds, Gulls and Waders. The Waterbird indicator is based on 17 of the 19 species for which indices have been produced. Lapwing and Snipe indices have not been included due to the erratic nature of their occurrence on Guernsey and in the case of the latter, it is a cryptic species unreliably

monitored by WeBS methodology. The wader indicator is based on the eight remaining wader indices, and runs from 1979 with the eight species throughout. The Gull indicator runs from 1993/94, and is based on the four gull species throughout. The waterbird indicator is based on the eight species of wader in the wader indicator plus Grey Heron and Cormorant from throughout, Dark-bellied Brent Goose, Little Egret and the four Gull species are included from 1993/94 and Shelduck from 2002/03. As is standard practise, species entering the waterbird indicator part way through the series have their indices rescaled to take the value in their year of entry set to equal that of the running indicator value in that year.

Two forms of the indicator have been produced. The unsmoothed indicator (Figure 9.3) takes values from the winter index values and this form of indicator lends itself to comparisons between the baseline and the value in a given year. The smoothed indicator (Figure 9.4) takes values from the smoothed trends and this form of indicator lends itself to consideration of the underlying trajectory.

A similar calculation to that applied to the individual species indices gives the percentage change in the smoothed indicator over the short-, medium- and long-term and since baseline (Table 9.3). Not surprisingly, given the declines in numbers of many of the wader species considered, there has been a steady decline in the smoothed wader indicator since it peaked in the early 1990s and the unsmoothed wader indicator has now reached an all-time low at 24% of the baseline value. The smoothed waterbird indicator remains above the baseline value although it has fallen rapidly over recent winters. This is mainly due to the increases in the gull indices since the turn of the century countering the declines in the wader indices. However, with the recent reversal to declining gull numbers this is no longer the case and the unsmoothed waterbird indicator has dropped below the baseline in the most recent two winters.

	Short	Medium	Long	Since Baseline
Waterbird	-33.2%	-25.8%	-13.1%	21.6%
Gull	-38.0%	-43.0%	-	-4.8%
Wader	-39.4%	-36.7%	-70.5%	-60.0%

Table 9.3 Percentage change for the Smoothed Wintering Waterbird Indicator over the short-, medium- and long-term, and since baseline. This figure, together with underlying values and calculations are available in the Excel file "Wintering Waterbird Indicators.xlsx" provided with the supporting material.



Figure 9.3 Unsmoothed Wintering Waterbird Indicator. This plot is also available together with underlying values and calculations are available in the Excel file "Wintering Waterbird Indicators.xlsx" provided with the supporting material

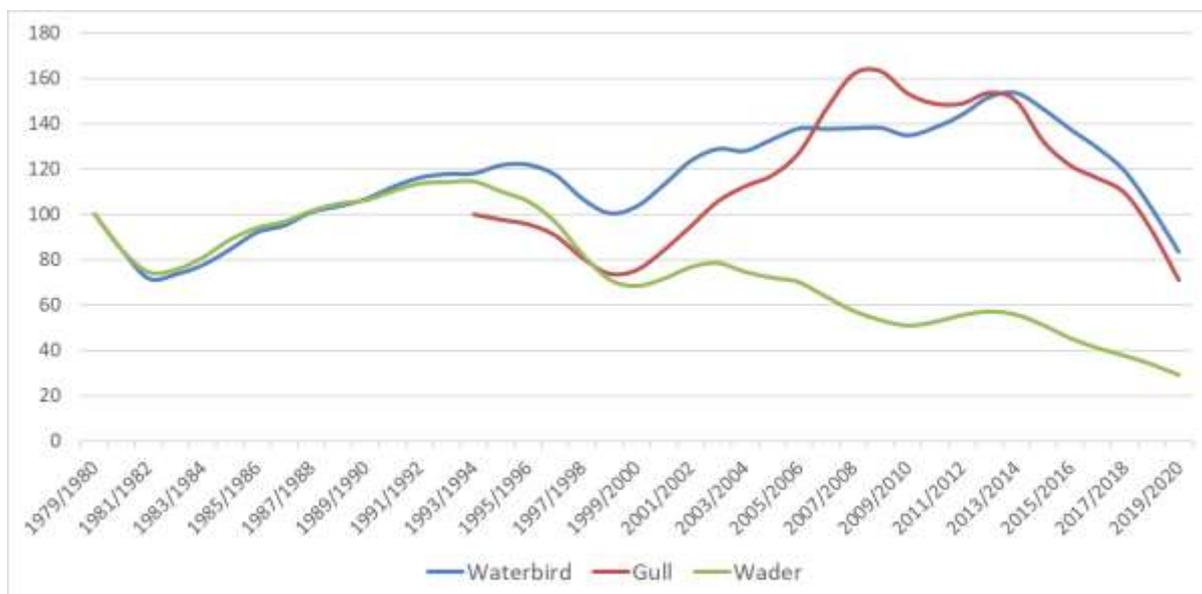


Figure 9.4 Smoothed Wintering Waterbird Indicator. This plot is also available together with underlying values and calculations are available in the Excel file "Wintering Waterbird Indicators.xlsx" provided with the supporting material.

9.3.3 Sector-level analyses

The relative importance of individual sectors to each species was determined by comparing Five-year Mean Peak of each sector with that of the overall Guernsey Shore site (Table 9.4). Comparison of trends on the more important sectors for a given species has the potential to identify more precisely where local pressures may be impacting that species.

Sector/site Name	Dark-bellied Brent Goose	Shelduck	Grey Heron	Cormorant	Oystercatcher	Lapwing	Grey Plover	Ringed Plover	Curlew	Turnstone	Sanderling	Dunlin	Snipe	Redshank	Black-headed Gull	Great Black-backed Gull	Herring Gull	Lesser Black-backed Gull
Guernsey Shore - Belle Greve (A1)																		
Guernsey Shore - Bordeaux (A2)																		
Guernsey Shore - Pembroke (B1)																		
Guernsey Shore - Grand Havre (B2)																		
Guernsey Shore - Port Grat, Port Soif, Portinfer (C1)																		
Guernsey Shore - Cobo (C2)																		
Guernsey Shore - Vazon (D1)																		
Guernsey Shore - Fort le Crocq (D2)																		
Guernsey Shore - Shingle Bank, Rue de la Rocque, Lihou (E1)																		
Guernsey Shore - Rocquaine (E2)																		

Table 9.4 Relative importance by species of count sectors by virtue of their contribution to the Five Year Mean Peak for Guernsey Shore WeBS site during the period 2015/16 to 2019/20). Dark Blue: 'high importance' - sectors contributing at least 20%; Light Blue: 'moderate importance' - sectors contributing less than 20% but at least 10%. Values underpinning this table are available in the Excel file "WeBS Site and Sector trends.xlsx" provided.

Percentage change for short-, medium- and long-term were calculated for each species and sector (Table 9.5). Sector-level analyses were feasible for 10 of the 19 species. In the other eight species, numbers on any one sector have been too low or the species occurs too intermittently to model the smooth trends.

Sector Name	Oystercatcher			Grey Plover		Ringed Plover		Curlew		Turnstone		Dunlin		Black-headed Gull			Great Black-backed Gull		Herring Gull		Lesser Black-backed Gull		
	Short	Medium	Long	Short	Long	Short	Long	Short	Long	Short	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Guernsey Shore																							
Guernsey Shore - Belle Greve (A1)	X	X	X																				
Guernsey Shore - Bordeaux (A2)																							
Guernsey Shore - Pembroke (B1)																							
Guernsey Shore - Grand Havre (B2)																							
Guernsey Shore - Port Grat, Port Soif, Portinfer (C1)																							
Guernsey Shore - Cobo (C2)																							
Guernsey Shore - Vazon (D1)																							
Guernsey Shore - Fort le Crocq (D2)																							
Guernsey Shore - Shingle Bank, Rue de la Rocque, Lihou (E1)	X	X	X																				
Guernsey Shore - Rocquaine (E2)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 9.5 Percentage change in the smoothed species abundance trends over short-, medium and long-term by sector of the Guernsey Shore WeBS site (see Table 9.2 for key to periods and colour coding). Sectors identified as important are marked with X for 'high importance' (dark blue in Table 9.4) and an x for 'moderate importance' (pale blue in Table 4). Values underpinning this table are available in the Excel file "WeBS Site and Sector trends.xlsx" provided.

The majority of **Oystercatchers** are concentrated on three sectors, A1, E1 & E2. No Alerts have been triggered for either of the two high importance sectors (E1 & E2) while medium Alerts have been triggered in the short- and long-term for the moderately important sector (A1). So although on

balance, this species is faring well on Guernsey this might indicate pressures on the 'Belle Greve' sector may be having a detrimental effect locally on this species.

The majority of **Grey Plover** are concentrated on two sectors C1 & E2, Port Grat, Port Soif & Pontinfer (C1) being the most important by far, consistently supporting over 90% of the Guernsey wintering population. A long-term high Alert has been triggered for this sector and clearly the decline here underpins the decline across Guernsey as a whole.

Ringed Plover are distributed more evenly around the Guernsey Shore. Sectors C1 & E2 are of highest importance but sectors A1, A2 & D1 also support moderately important numbers. High Alerts have been triggered for Belle Grave (A1) in the long- and medium-term, and a medium Alert in the short-term and for Vazon (D1) high Alerts have been triggered for all terms. A high Alert has been triggered in the long-term for Rocquaine (E2). A medium Alert has been triggered for 'Port Grat, Port Soif & Pontinfer' (C1) in the short-term. This means that at least one Alert has been triggered for this species on all sectors where the smooth trend could be modelled. Accordingly it appears that the overall decline of this species is not concentrated on any one part of Guernsey supporting the conclusion that it is being driven by broadscale rather than local pressures.

The majority of **Curlew** are concentrated on two sectors, E1 & E2, the 'Shingle Bank Rue de la Rocque and Lihou' sector (E1) being by far the most important, typically supporting about 70% of the Guernsey Shore winter population. A medium Alert has been triggered for this sector in the short-term and is responsible for the equivalent decline seen in the Guernsey winter population. Although there are no other Alerts for either of these two sectors, there is a medium Alert in the long-term that was triggered for Guernsey Shore suggesting that, although it is not possible to model the trends across the other sectors, the relatively small number of birds they support have nonetheless dwindled over the long term.

Turnstone are more evenly distributed around Guernsey Shore than other waders with eight sectors (A1, A2, B1, B2, C1, C2, D1 & E2) supporting over 10% of the Guernsey Shore winter population, two of which (B2 & D1) support over 20%. As previously stated, the decline across Guernsey has been more rapid than the decline across the Channel Islands as a whole suggesting local pressures are exacerbating the decline on Guernsey. Alerts, the majority of them high, have been triggered for all sectors indicating the decline is universal and this being the case there is no evidence to suggest that any pressures that may be driving this decline are concentrated in any particular area within Guernsey.

The majority of **Dunlin** are concentrated on three sectors, C1, D1 & E2, 'Port Grat, Port Soif & Pontinfer' (C1) being the most important holding up to 75% of the Guernsey Shore winter population. A medium Alert has been triggered in the long-term for this sector whereas high Alerts have generally been triggered for most terms across the other sectors including the other two moderately important sectors. It therefore appears that it is the cumulative declines across the other sectors that have led to the long-term decline across Guernsey Shore, with the most important sector supporting an increasing proportion of the dwindling winter population, especially over the most recent decade. The medium Alert in the short-term on the 'Port Grat, Port Soif & Pontinfer' (C1) sector is therefore of concern.

Black-headed Gull is widely spread across the sectors of Guernsey Shore but four sectors, A1, B2, D1 & E1 are of high importance, and regularly support over 100 individuals, with two others C2 & E2 supporting moderate numbers. High Alerts have been triggered for two of the high importance sectors, Belle Greve (A1) and Vazon (D1), in the medium-term with medium Alerts being triggered in the short-term for Vazon and Rocquaine (E2) and in the medium-terms for Rocquaine and 'Shingle Bank, Rue de la Rocque and Lihou' (E1). Overall declines on some sectors have largely been balanced

by increases elsewhere and as previously stated, there are no major concerns about this species with only a medium Alert having been triggered for the medium-term for Guernsey Shore as a whole.

Great Black-backed Gull is another species that is widely distributed around the coast but three sectors are of high importance, B1, D2 & E1 with another two supporting moderately important numbers. High Alerts have been triggered for Fort le Crocq (D2) in the medium-term, along with medium Alerts in the short-term and medium Alerts have been triggered in the medium-term for 'Shingle Bank, Rue de la Rocque and Lihou' (E1). Numbers for Pembroke (B1) have held up although there was a sharp drop in winter 2019/20.

Herring Gulls are distributed widely around the coast but Pembroke (B1) supports up to 70% of the total. No Alerts have been triggered for this sector but elsewhere many medium Alerts have been triggered in the short- and medium-term. It is apparent that as the Guernsey Shore winter population has declined in the medium- and short-term this has been through loss of numbers evenly across the site.

Lesser Black-backed Gulls are mainly concentrated on three sectors B1, E1 & E2 any one of which can support over 50% of the overall total on a given occasion. Alerts have been triggered in the short- and medium-term for both Pembroke (B1) and Rocquaine (E2) which between them have driven a recent steep decline across Guernsey.

9.4 Discussion

Although Guernsey does not play host to large numbers of wintering waterbirds, analysis of the data collected under the WeBS Core Count scheme has demonstrated that it is possible to index numbers and describe trends for the Guernsey Shore winter population of at least the more numerous species. Furthermore, the resulting trends are generally smooth enough to allow the severity of any declines to be quantified following the methodology of the WeBS Alerts system.

There is also scope to monitor the overall situation through the generation of a Winter Waterbird Indicator (multiple species index) following the methodology that is used by the BTO to provide annually updated Winter Waterbird Indicators for the UK, England and Scotland to the UK government conservation agencies (Defra, Natural England and NatureScot respectively).

Unfortunately, this work has demonstrated that the long-term pattern of change has been one of decline for many species. With the exception of Oystercatchers, the abundance of wader species considered to be well monitored by the WeBS Core Count methodology, have either declined severely as is the case for the Grey Plover, Ringed Plover, Turnstone, Dunlin and Redshank throughout the period monitored, or have been showing persistent shallow declines more recently as is the case for Curlew and Sanderling. That said, in most cases the declines appear to be following broader scale declines apparent across the Channel Islands and following a pattern similar to that of the UK and Republic of Ireland making it unlikely that they are being driven by pressures specific to Guernsey. Turnstone may be an exception as it is declining more rapidly than the overall trend for the Channel Islands. The sector level analysis highlighted the importance of some areas within Guernsey to waders but did not suggest that any particular areas are suffering disproportionately from local pressures.

Despite this, it is known that disturbance has increased in almost all sectors

Until recently, the long-term pattern of change has been favourable for non-waders. The two wildfowl considered, Dark-bellied Brent Goose and Shelduck had both been increasing in abundance,

albeit their numbers remaining relatively modest, however numbers recorded for both dipped sharply over the most recent two winters. This corresponds with unexpectedly sharp or accelerated declines across a number of other species including Little Egret, Cormorant, Curlew suggesting this may be a response to abnormal winter conditions or some other factor that would affect a broad range of species. Similar sharp declines in abundance of Herring Gull and Great Black-backed Gull are more likely to be driven by the closure of the Mont Cuet landfill site.

The analysis in this chapter has concentrated on the Guernsey Shore WeBS site and its 10 constituent sectors. Historically, counts also covered the Herm shoreline and several inland wetland sites on Guernsey. Resurrecting WeBS counts, at least for the shoreline of Herm, could usefully expand the picture for the Bailiwick in the future once a reasonable time series is obtained.

10. PRIORITY SPECIES GUIDANCE

Regular assessments of status are critical aids for identifying species and habitat priorities. In the UK, birds are assessed on an approximately six year cycle by two parallel but similar processes. One of these is the Red and Amber listing of Birds of Conservation Concern according to criteria developed since the first formal implementation of BOCC in 1996. The latest version, BOCC5, was published in 2021 and considers bird populations in the UK, the Isle of Man and the Channel Islands. The other process uses criteria developed by the IUCN to classify species according to the probability of extinction, and places species in categories of threat level from 'Endangered' to 'Least Concern'. This has been carried out on birds twice in Great Britain, hence excluding the Channel Islands, with the latest version (IUCN2) published in 2021. The list of species in the IUCN 'threatened' categories (Critically Endangered, Endangered and Vulnerable) overlap to a great extent with the BOCC Red List but red-listing is better at highlighting concerning declines in still common species, whereas the IUCN process highlights small and hence vulnerable populations at risk of extinction. Both processes work best at larger geographical scales, where significant proportions of the global population occupies the area. The IUCN has developed rules to adapt the system for small geographical areas, such as countries, but this has not been done for red-listing.

One of the first steps is to identify the list of species to assess. This is a particular issue with birds because of their mobility and the high possibility of vagrants to areas where they do not breed or regularly winter. For BOCC in the UK, only naturally occurring species with self-sustaining populations were considered. Vagrants, defined as species assessed by the British Birds Rarities Committee (www.bbrc.org.uk), or species occurring only as scarce migrants (see e.g. White & Kehoe 2020a,b) were excluded. Breeding species were considered only if they had been proven (or strongly suspected) to have bred for a period of at least five consecutive years within the most recent 25 years for which data were available. Some species are not assessed for breeding populations, but may be assessed due to regularly occurring wintering populations. For the IUCN listing, the rules were similar but not identical, for example, breeding species had to have bred in GB for the last 10 years.

In both processes, the point is to avoid assigning an inappropriately high level of conservation concern to species which very rarely occur or breed and may well be abundant and stable elsewhere. The inclusion of species that occur only in passage is a separate decision, and distinguishing these from 'wintering populations' can be a problem of definition. Moreover, good data are usually lacking. Passage species were excluded in the UK BOCC and GB IUCN assessments, but could be included if the area being assessed is an important stopover, particularly in relation to adjacent marine territory. Non-native species such as Pheasant are generally excluded as they are not conservation priorities, although assessing their population status may be valuable for other reasons. Non-natives are those which arrive through human intervention (escapes from pets/pet trade/ornamental gardens/zoos and deliberate releases) or naturally but from solely non-native populations elsewhere (as in Sacred Ibis from France). New species that colonise through unassisted movement (for example the northward spread of species such as Little Egret) are not non-native and hence are included once the establishment meets the criteria for regular breeder (e.g. breeding for 10 consecutive years). However, because the island of Guernsey is small and likely to have intermittent breeding from a number of species widespread to the north (in the UK) or south (in France), we suggest keeping these species off the short list of Priority Species (unless there is evidence of a decline) but maintained on a long list because the status of those tiny populations is undeniably vulnerable.

It may be desirable to also include on the list any globally-threatened species that occur even sporadically in the area, on the grounds that any relevant management could improve its global status.

The second step is to assess the status of populations of all species regularly breeding, regularly wintering, and/or important passage species. The key attributes are population trend and population size. Other attributes such as the importance of the local population relative to global populations (or European or flyway if more appropriate) and the number of sites on which the species occurs (an indication of vulnerability) are used to amber-list species under BOCC, and are also part of the IUCN criteria.

The most important measure is the assessment of population trend, in abundance or occupancy, because this most clearly indicates a problem. BOCC uses a threshold of a 50% decline over 25 years, and a longer time period if available, to assign a red-listing and 25% threshold to assign amber-listing. IUCN uses largely similar measures of severity of decline but assesses these according to generation length (3 x generation length or ten years, whichever is longer). At the UK or GB level, it was possible to assess the population status of most species based on one of the main core bird monitoring schemes, such as the Breeding Bird Survey, the Seabird Monitoring Programme or the Wetland Bird Survey. Other species, such as Peregrine Falcon and Merlin, are monitored through periodic national surveys, and a group of rare species are monitored through the UK Rare Breeding Bird Panel, which collates information from a range of bird recording schemes and assesses the status of populations. Where insufficient data were available, it was sometimes possible to assess the status of populations using bespoke methods. Given the many schemes and high recording intensity, relatively few species are data deficient at the UK level but this will be a bigger issue at a small geographical scale. We recommend that any species showing evidence of a breeding or wintering decline of more than 50% through the relevant scheme (BBS, WeBS, SMP) is designated as a Priority Species in this assessment, and species with declines of <50% but more than 25% could be retained on the long list. Given the small size of the area, these declines are often based on small samples and may no longer qualify when the process is next repeated. Movement on and off the list due to noise in the sampling as well as in time periods should be minimised but some are inevitable. That is why we do not recommend setting lower thresholds for assigning priorities.

Population size is used in BOCC but small populations with no evidence of problems (no declines) will only be amber rather than red-listed. For the UK BOCC, this threshold is set at 300 breeding pairs or 900 non-breeding individuals during the winter. For IUCN, two of the criteria for listing include (i) a very small and hence vulnerable population, and (ii) a small population but continuing decline. These thresholds should be set based on the size of the geographical area concerned. The island of Guernsey is very small and hence many species will have small populations but it may not be sensible to assign all of these priority. If these are also in decline, whether qualifying for the 50% red-listing BOCC criteria or not, or where the population status is unknown, they are potentially vulnerable. However, the IUCN process also incorporates a rescue effect by applying a down-grade in the level of conservation concern for small or declining populations of species likely to be rescued by increasing populations in surrounding areas. So for Guernsey, information on the population status of species in the UK or in France could be used in the priority listing process.

The importance of a population in a broader geographical context, for example 1% of the wintering population, is grounds for amber-listing in BOCC. This is usually used for colonial breeding species or aggregating wintering populations where a relatively small number of sites hold the global population. Our recommendation is that any species that meet this 1% threshold on Guernsey should be listed.

For the UK BOCC process the number of sites (assessed by SPAs) holding the species is used for amber listing but given the relatively small size of Guernsey, this is effectively the situation for all species so is unlikely to be of much use here.

Such assessments should be repeated regularly at a frequency compatible with the effort required and the likelihood of sufficient new data to change the previous assessment. The UK BOCC and GB IUCN processes are undertaken approximately every six years, also the timetable for reporting under previous international requirements such as the Birds Directive. In the case of the UK with a plethora of bird monitoring programmes, there are likely to be changes in the status of many species based on abundance. However, bird atlases are undertaken on a 20 year schedule and hence assessments of changes in range can be updated much less frequently. Moreover, if monitoring efforts are augmented to fill gaps where data is deficient and improve the robustness of trend analyses, subsequent updates will capture the new information.

In summary, the recommended steps for Priority Species listing in Guernsey are as follows:

- Have two lists of priority species - a short list for priority species and a longer list for vulnerable and other significant species.
- Exclude all species considered vagrants, rare and scarce migrants using the Guernsey Bird Checklist 2020 (Lawlor 2021 - and its annual updates) unless they qualify as a regular breeding species.
- Include breeding species if they have bred for 5 consecutive years in the last 25 years.
- Do not include non-native or new breeding species on the short list, but keep naturally occurring new breeders on the long list as those small populations are vulnerable.
- Assess the status of populations of all species regularly breeding, regularly wintering, and/or important passage species.
- Key attributes are population trend and population size, but other attributes such as the importance of the local population relative to global populations (or European or flyway if more appropriate) and the number of sites on which the species occurs (an indication of vulnerability) should be used to list species. Species like Peregrine and Raven may only have a few pairs on island but they are vulnerable and should be included on the priority short list.
- We recommend that any species showing evidence of a breeding or wintering decline of more than 50% through the relevant scheme (BBS, WeBS, SMP) is designated as a Priority Species in this assessment, and species with declines of <50% but more than 25% could be retained on the long list.
- Species in decline, whether qualifying for the 50% decline criteria or not, or where the population status is unknown, are potentially vulnerable. However, information on the population status of species nearby in the UK or in France, could be used in the priority listing process.

- Any species that meet 1% of the breeding or non-breeding population threshold on Guernsey should be listed.
- Assessments should be repeated regularly at a frequency compatible with the effort required and the likelihood of sufficient new data to change the previous assessment, if monitoring efforts are augmented to fill gaps where data is deficient and improve the robustness of trend analyses, subsequent updates will capture the new information.

11. COVERAGE OF PRIORITY SITES

11.1 Introduction

Effective monitoring is all about understanding exactly what the aims are, what is actually being monitored and any inherent biases in how the data are gathered. Semi-structured schemes such as BirdTrack or Guernsey Birds are not the mainstay of long-term population monitoring schemes. For example, there will be strong biases to where individual birdwatchers prefer to go and record birds and effort will vary throughout the year. However, they are very good at monitoring the less common species found in the islands. At the other end of the spectrum, The Wetland Bird Survey (WeBS), and the Seabird Monitoring Program (SMP) aim for complete coverage and this is largely achieved in Guernsey. In WeBS, for example, all the non-cliff coastlines are counted once a month. The south coast bays are an exception, but these do not tend to hold many wintering waterbirds. When the Bailiwick-wide censuses of seabirds are carried out, coverage of the two Ramsar sites is complete and so both of these surveys can be thought of as a complete census, rather than a sample-based survey.

The remaining survey, the Breeding Bird Survey (BBS), is however, a sample-based survey. Squares are randomised and the number of squares in an area is stratified by observer densities (i.e. BTO membership). These constitute the distribution of squares at the current time. In this chapter, we look at the BBS squares in terms of how representative the squares are in terms of habitats of conservation importance as well as Sites of Special Significance (SSS) and Areas of Biodiversity Importance (ABI).

11.2 Methods

We overlaid the Channel Island 1-km grid over the Mean High Water extent, clipped the square so that only terrestrial land was remaining and calculated the area of terrestrial land that each of the BBS squares covered. We then summed the area of the 20 BBS squares and expressed it as a percentage of the terrestrial land area on Guernsey (excluding Lihou and other islands) to calculate the percentage of Guernsey's terrestrial habitats covered by BBS squares.

Next, we calculated the area of each SSS and ABI in each of the clipped 1-km squares on Guernsey (Figure 11.1) and summed the areas inside and outside of BBS squares. Similarly we overlaid the 2018 Habitats Survey (Hayward and Scopes 2019, Figure 11.2) along with the extent of gardens and buildings over the clipped 1-km squares and calculated the area of each habitat inside and outside of the Breeding Bird Survey squares.

To determine which habitats were under- or over-represented in the BBS sample of squares, we calculated Jacobs Selection Index for each habitat $D = (r - p)/(r + p - 2rp)$, where r is the proportion of habitat used and p the proportion of habitat available. A value of +1 signifies that the habitat was only found on BBS squares, a value of -1 that it was only present outside BBS squares and a value of zero indicates the the habitat made up a similar proportion of the area both inside and outside BBS squares, i.e. there was no bias.

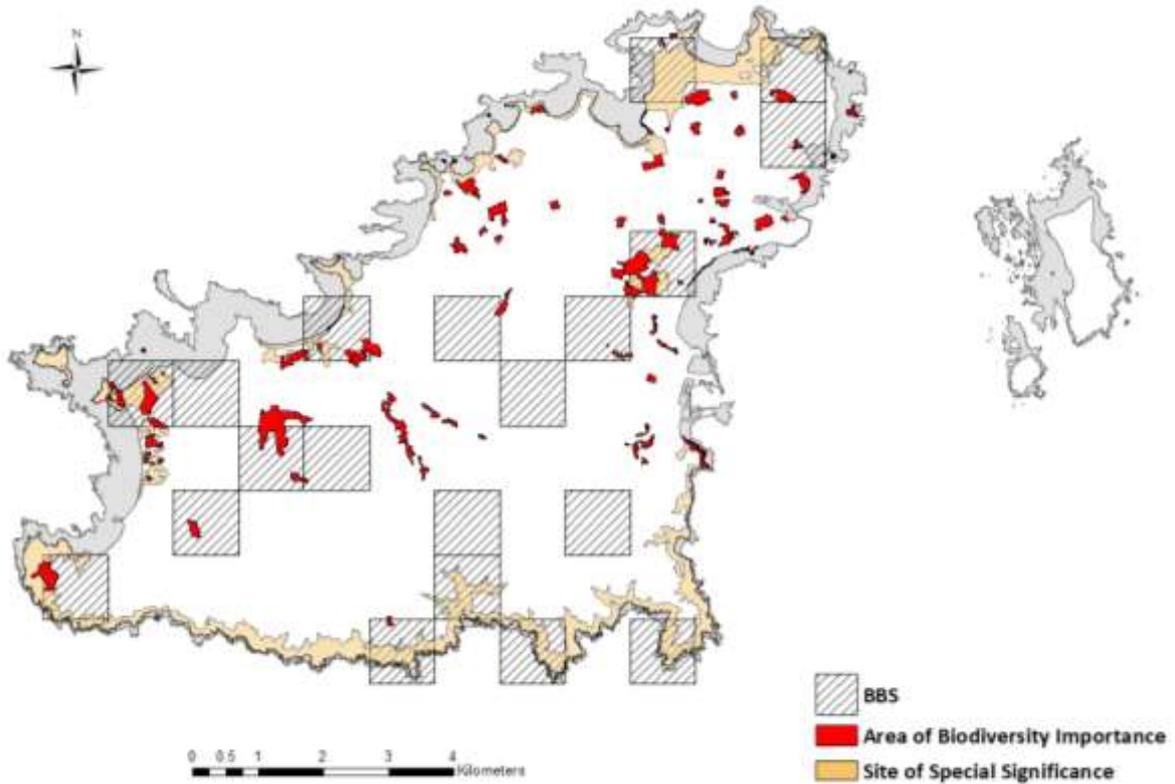


Figure 11.1 Map of Guernsey showing the distribution of designated sites of nature conservation importance with the 20 Breeding Bird Survey (BBS) squares overlaid.

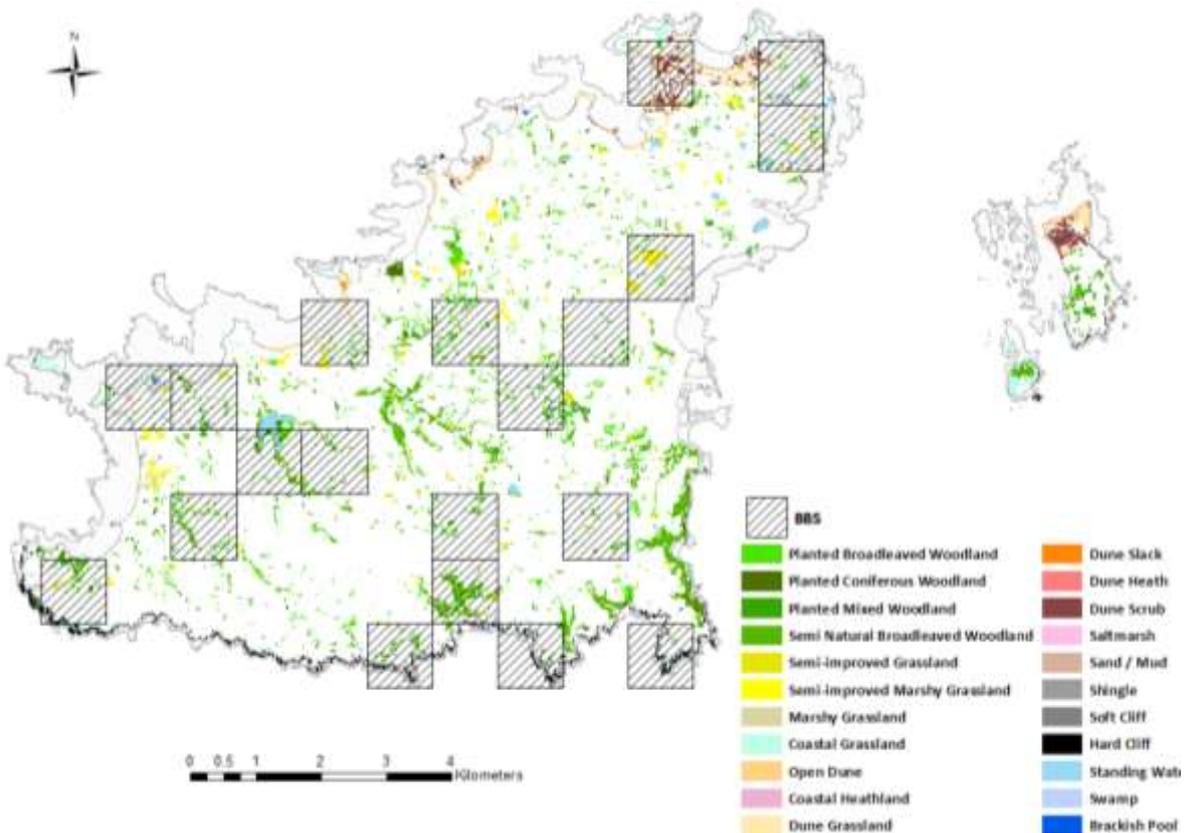


Figure 11.2 Map of Guernsey showing the distribution of habitats of conservation importance with the 20 Breeding Bird Survey (BBS) squares overlaid.

11.3 Results

The 20 BBS squares cover 1,706 ha (26.9%) of the 6,344 ha that make up the island of Guernsey. There was a significant bias in terms of coverage of sites that are important for biodiversity, as the sample of 20 BBS squares covered 38.1% of the SSS area and 37.2% of the ABI area, approximately 40% higher than would be expected by chance (Table 11.1). Only two of the nine SSS areas (22%) were not covered at all by any BBS squares, whereas a higher proportion of ABI areas were not covered (37 out of 56 = 66%), indicating that BBS tended to have better coverage of the most important sites/area on the island.

For the nine most dominant habitats found on the island (i.e. those >100 ha, including buildings and gardens), the selection indices were generally small (between 0.2 and -0.2) indicating that coverage of these habitats by BBS was representative of what is present (Figure 11.3). In this group of nine habitats, buildings showed the largest negative index (-0.16) followed by gardens (-0.06), supporting the conclusion that areas which are better for biodiversity and nature conservation are over represented in the sample of BBS squares, and urban and built up areas are less well represented.

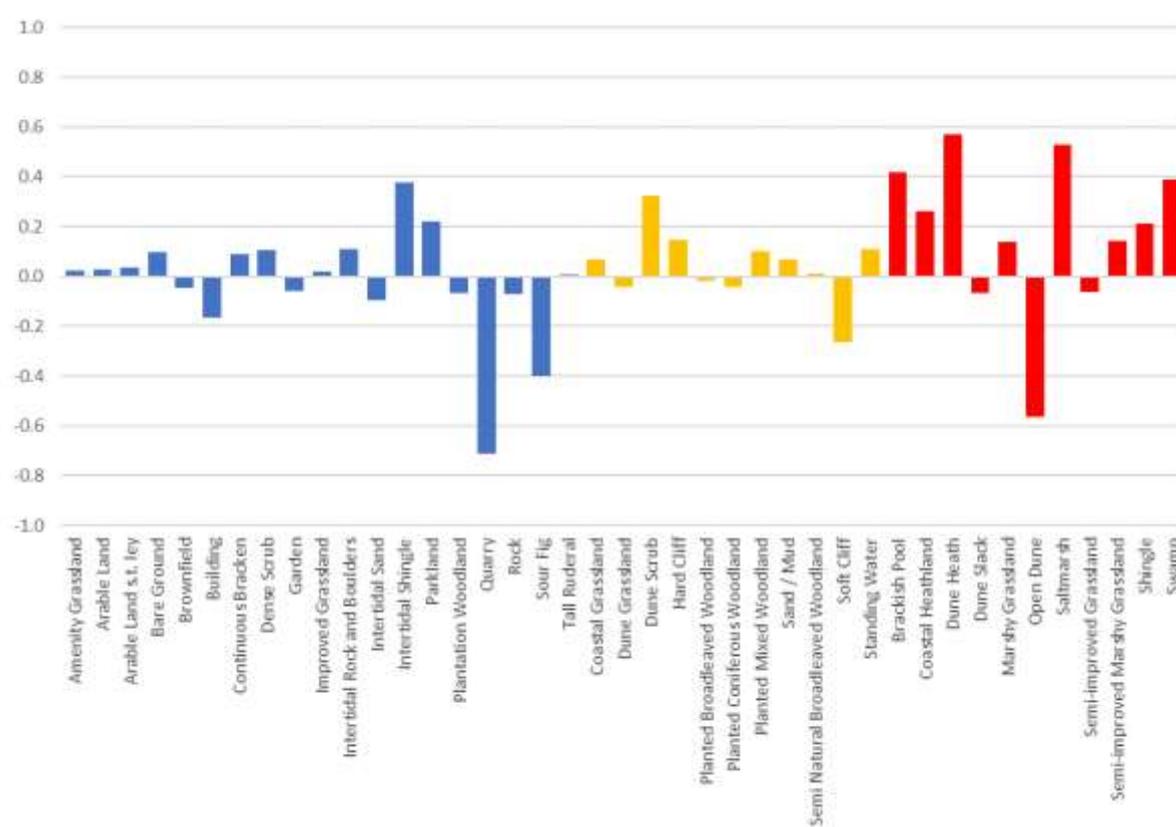


Figure 11.3 Jacobs Selection Index showing how habitats inside BBS squares are representative of the habitats found on Guernsey as a whole. A selection index of -1 indicates that BBS covers none of that habitat and a value of +1 indicates that all of that habitat will be in BBS squares. A value of zero indicates that a habitat appears in a similar proportion within and outside BBS squares. Red bars = habitats of conservation importance and particularly important in a Guernsey context; Orange bars = habitats of conservation importance; Blue bars = habitats that are not of conservation importance.

As would be expected, the rarer habitats have larger (+ or -) selection indices, as presence of an individual rare habitat would be much more dependent on chance. This relationship between area of habitat and the selection index is reasonably consistent (Figure 11.4, note log scale) but does indicate that, where a habitat area is less than 20 ha, it can be highly under- or over-represented in

the BBS square sample. These include dune habitats, saltmarsh and quarries, which are very localised in distribution in Guernsey.

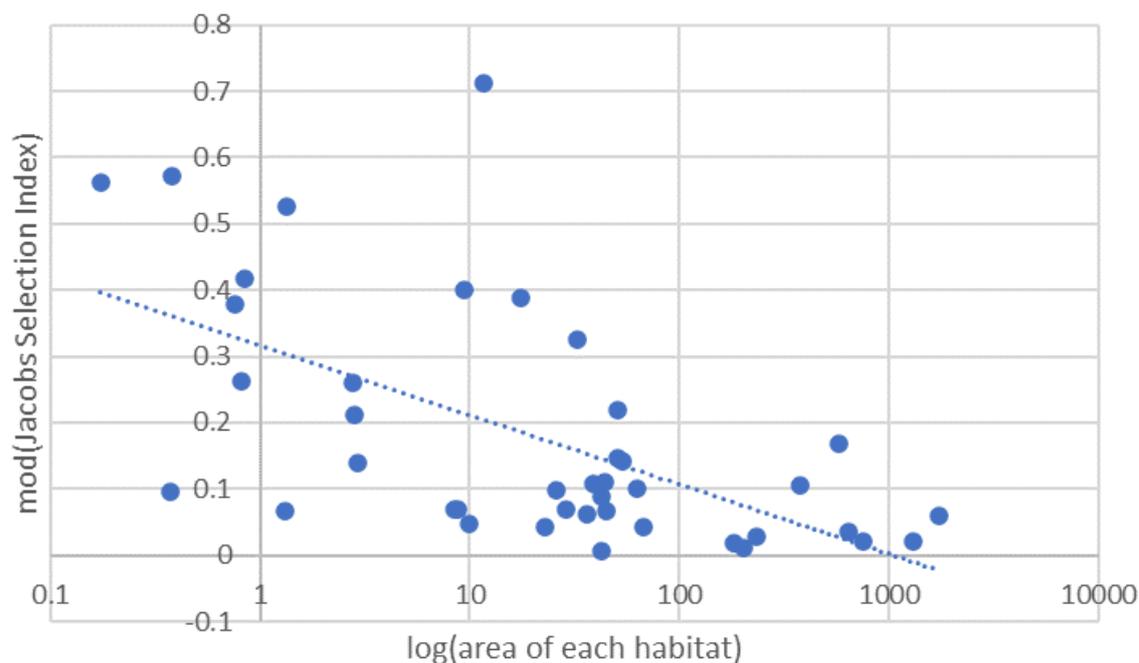


Figure 11.4 Relationship between the area of individual habitats from the 2018 Habitat Survey and the magnitude of the Jacobs Selection Index, ignoring the minus symbol.

Habitats of Conservation Concern (Henney 2019 , marked as red and orange in Figure 11.3) are on average over-represented in the sample of BBS squares. Coverage by BBS squares in terms of the total area of that habitat is as follows: habitats of conservation importance particularly important in a Guernsey context (Red) - 48.5% on average (n=11 habitats), habitats of conservation importance (Orange) - 31.0% (n=11) and habitats not of conservation importance (Blue) - 28.1% (n=19).

11.4 Discussion

The Breeding Bird Survey was set up to cover areas that were typical of the habitats found on Guernsey. However, the 20 BBS squares are, on average, covering habitats and sites that are important for biodiversity and nature conservation, more than would be expected. There are some very clear biases with seven out of nine Sites of Special Significance being wholly or partially included in BBS squares and approximately half of the most important habitats (those coloured red in Figure 11.3). Conversely, this means that built up areas and gardens tend to be less well represented and the suite of species that can be covered by BBS may well be increased if more of these areas were included.

Some of the rarer habitats are unlikely to be adequately surveyed by BBS methodology. This is not surprising since BBS was designed to survey birds in the wider countryside and it largely fulfils that brief in Guernsey as the selection indices for habitats that have an extent of greater than 100 ha were between -0.2 and 0.2. If data are needed on the rarer habitats (e.g. quarries, wetland habitats, dune systems) then specific and targeted surveys will need to be carried out using a different more intensive survey methodology.

(a) Sites of Special Significance (SSS)	Inside BBS squares (ha)	Outside BBS squares (ha)	Total (ha)	%
4.10 South Vazon / La Grande Mare wet meadows	5.71	6.11	11.82	48.3
4.11 St Sampson's Marais / Ivy Castle	18.99	1.19	20.19	94.1
4.2 Cliffs	124.4	237.54	361.94	34.4
4.3 Fort Hommet & Vazon coast	4.44	15.65	20.09	22.1
4.5 La Claire Mare, Lihou and L'Eree	23.83	4.78	28.61	83.3
4.6 L'Ancrese Common	143.25	115.55	258.8	55.4
4.7 Les Vicheries and Rue Rocheuse	1.27	16.43	17.7	7.2
4.8 Lihou Island	0	11.69	11.69	0
4.9 Cobo to Vale Church	0	114.13	114.13	0
Total area (ha)	321.9	523.07	844.97	38.1

(b) Areas of Biodiversity Importance (ABI)	BBS squares	Outside BBS squares	Total	%
4.10 South Vazon / La Grande Mare wet meadows	7.02	8.29	15.31	45.9
4.11 St Sampson's Marais / Ivy Castle	20.45	3.93	24.38	83.9
4.3 Fort Hommet & Vazon coast	0.66		0.66	100
4.5 La Claire Mare, Lihou and L'Eree	10.75	0.22	10.96	98.1
4.6 L'Ancrese Common	0.35	1.96	2.31	15.2
4.7 Les Vicheries and Rue Rocheuse	1.63	5.39	7.01	23.3
4.9 Cobo to Vale Church		10.83	10.83	0
Baubigny		0.99	0.99	0
Bordeaux	1.17	0.41	1.58	74.1
Braye Road		1.23	1.23	0
Bulwer Avenue		0.2	0.2	0
Candie Cemetery		1.29	1.29	0
Charroterie Valley	1.1	4.06	5.16	21.3
Cliffs and Cliff Valleys	6.31	5.48	11.79	53.5
Cuckoo Lane		1.59	1.59	0
Delancey Lane		0.81	0.81	0
Delancey to St Clair & Robergerie		3.74	3.74	0
Fauxquets Valley		10.85	10.85	0
Fosse Andre	0.1		0.1	100
Franc Fief		1.43	1.43	0
Grandes Rocques		0.21	0.21	0
Grosse Hougue		2.67	2.67	0
Heritage Walk		2.77	2.77	0
Houmet Paradis Island		1.48	1.48	0
Ivy Castel Lane	0.32		0.32	100
La Croix Martin		0.22	0.22	0
La Garenne d'Anneville		1.24	1.24	0
La Hougue du Pommier		0.89	0.89	0
Le Grand Pre	4.22		4.22	100
Le Marais	1.7	4.44	6.13	27.7
Le Pont du Valle to Port Grat		0.63	0.63	0
Le Villocq	0.61	2.08	2.69	22.7
Les Amballes		0.15	0.15	0
Les Banques	0.2	0.77	0.97	20.6
Les Effards		1.48	1.48	0
Les Hougues Pres		1.75	1.75	0
Les Mielles		0.76	0.76	0
Les Vardes		0.58	0.58	0
Les Villets	0.66	0.24	0.9	73.3
Longue Hougue		4.27	4.27	0
Miellette Bay		0.14	0.14	0
Mont Arrive		1.19	1.19	0
Mont Crevelt		0.53	0.53	0
Port Soif		0.31	0.31	0
Quanteraine	3.01		3.01	100
Robergerie		0.46	0.46	0
Rope Walk		1.37	1.37	0
Route des Pecqueries		0.19	0.19	0
Rue Jacques		0.28	0.28	0
Sous l'Eglise	1.82		1.82	100
Spur Pont		0.84	0.84	0
St Saviour's Reservoir	10.75	12.81	23.56	45.6
Talbots Valley		3.15	3.15	0
The Marais		2.44	2.44	0
Vale Castle/Rue des Barras		3.96	3.96	0
Vingtaine de l'Epine		6.13	6.13	0
Total area (ha)	72.82	123.09	195.92	37.2

Table 11.1 Area of Sites of Special Significance and Areas of Biodiversity Importance inside and outside Breeding Bird Survey squares.

12. DISCUSSION

12.1 Overview

Some groups, such as breeding seabirds and wintering waterbirds, have been well monitored in Guernsey since the 1970s and trends and robust estimates of change can be calculated for these groups. Terrestrial and freshwater species are less well monitored and, for the first time, this report has brought together long-term datasets to analyse trends in the common and widespread terrestrial breeding species covered by the Breeding Bird Survey.

We consider seven monitoring schemes in this report and the species covered by each is summarised in Table 12.1. We have allocated species to each scheme based on (i) whether there is sufficient data for species trends to be produced (Breeding and Wetland Bird Surveys, Seabird Monitoring Programme), (ii) all species for which a description is required (Bailiwick of Guernsey Rarities Committee), all records of scarce and uncommon species (Guernsey Birds, on the grounds that birdwatchers tend to preferentially record uncommon species) and records of birds in gardens (Garden BirdWatch) where they occur in 50% or more gardens. At present, there are too few records being submitted to BirdTrack to be useful as a monitoring tool and the records in Guernsey Birds will need some data cleaning to ensure that the location is consistently recorded.

Guernsey Birds and BirdTrack will collect data on all species but the lack of systematic monitoring does mean that all that can currently be done is identify where a species is present by date and location. Formal trends to look at population change can not be calculated at the moment, but work to use this semi-structured data is currently being investigated, but is time consuming and complex. This means that it may be possible to look at changes in distribution over time which, in itself, is a valuable monitoring tool.

The Breeding Bird Survey has produced trends for 27 breeding species and, with an increase in the number of squares, it will likely be possible to produce trends for another ~10 species. Unsurprisingly, given the highly fragmented nature of Guernsey's landscape, there is a large overlap between species recorded in Garden BirdWatch and the Breeding Bird Survey, Guernsey's two main systematic terrestrial bird surveys and they are largely complementary. At present, uptake in Garden BirdWatch is low in the islands, but with the popularity of watching and feeding birds in gardens and the current free option, promoting uptake of Garden BirdWatch in the islands would provide additional data to compliment the Breeding Bird Survey and also add a few more species such as Sparrowhawk and Long-tailed Tit, for which trends may be able to be calculated. All scarce and rare birds are generally reliably recorded by birdwatchers, and vagrants are verified by the local rarities committee and published annually in the Transactions of La Société Guernesiaise.

In terms of breeding species that are not monitored, it is clear from the gap analysis (Table 12.1) that certain groups and individual species fall outside of the formal systematic monitoring schemes. Of the 72 breeding species, approximately half are not covered by any monitoring scheme sufficiently enough to allow trends to be produced. These tend to be raptors/owls/scavengers (e.g. Sparrowhawk, Marsh Harrier, Buzzard, Barn Owl, Long-eared Owl, Peregrine, Raven), arguably species that should be closely monitored given the risk of persecution and accidental poisoning, and species of woodlands (Garden Warbler, Long-tailed Tit, Firecrest, Goldcrest, Short-toed Treecreeper), wetlands (Moorhen, Coot, Cetti's Warbler, Reed Warbler), urban areas/buildings (Swift, House Martin) and coastal heaths (Stonechat, Rock Pipit, Linnet, Meadow Pipit). There are also a number of scarce/occasional breeders that will not be effectively monitored by any scheme (e.g. Sand Martin, Willow Warbler, Black Redstart, Wheatear, Grey Wagtail, Pied/White Wagtail, Cuckoo). Some of these habitats (e.g. coastal heath, woodland and wetlands) could be targeted by regular surveys to provide trends on restricted range species.

Individual breeding attempts by rare species will be picked up by birdwatchers but a more formal system of recording rare breeding birds would be a useful addition. These are already collected on an informal basis by the bird recorder but perhaps a more formal list of rare breeding species (akin to the Rare Breeding Birds Panel (RBBP) in the UK) would ensure more systematic recording of breeding attempts by scarce and vulnerable breeding birds.

Table 12.1 Summary of how effectively breeding species are monitored by each of the main bird survey schemes on Guernsey. BBS – species for which trends can be calculated; GBW – species which occur in >50% of gardens, which could potentially be monitored effectively with a larger sample size; BirdTrack – so few records are entered that it is not a useful tool currently; GB – scarce or rare species for which >50 records per year are entered into the database; SMP – all seabird species; WeBS – all waterbirds for which non-breeding trends can be produced; BGRC – rare species which are assessed annually by the rarities committee.

Common name	Breeding Bird Survey (BBS)	Garden Birdwatch (GBW)	BirdTrack (BT)	Guernsey Birds (GB)	Seabird censuses (SMP)	Wetland Bird Survey (WeBS)	Bailiwick of Guernsey Rarities Committee (BGRC)
Shelduck						WeBS	
Mallard	BBS	GBW					
Fulmar					SMP		
Little Grebe							
Little Egret					SMP	WeBS	
Shag					SMP		
Cormorant					SMP		
Sparrowhawk		GBW					
Marsh Harrier							
Buzzard							
Water Rail							
Moorhen							
Coot							
Oystercatcher	BBS					WeBS	
Great Black-backed Gull					SMP	WeBS	
Herring Gull		GBW			SMP	WeBS	
Lesser Black-backed Gull					SMP	WeBS	
Common Tern					SMP		
Guillemot					SMP		
Razorbill					SMP		
Puffin					SMP		
Feral Pigeon							
Stock Dove							
Woodpigeon	BBS	GBW					
Collared Dove	BBS	GBW					
Cuckoo				GB			
Barn Owl							
Long-eared Owl							
Swift							
Great Spotted Woodpecker							
Kestrel	BBS	GBW					
Peregrine							
Magpie	BBS	GBW					
Jackdaw							
Carrion Crow	BBS	GBW					
Raven							
Blue Tit	BBS	GBW					
Great Tit	BBS	GBW					
Sand Martin							
Swallow	BBS	GBW					
House Martin							
Cetti's Warbler							
Long-tailed Tit		GBW					

Common name	Breeding Bird Survey (BBS)	Garden Birdwatch (GBW)	BirdTrack (BT)	Guernsey Birds (GB)	Seabird censuses (SMP)	Wetland Bird Survey (WeBS)	Bailiwick of Guernsey Rarities Committee (BGRC)
Willow Warbler							
Chiffchaff	BBS	GBW					
Reed Warbler							
Blackcap	BBS	GBW					
Garden Warbler							
Whitethroat	BBS						
Firecrest							
Goldcrest		GBW					
Wren	BBS	GBW					
Short-toed Treecreeper							
Starling	BBS	GBW					
Blackbird	BBS	GBW					
Song Thrush	BBS	GBW					
Redwing		GBW					
Robin	BBS	GBW					
Black Redstart							
Stonechat							
Wheatear							
House Sparrow	BBS	GBW					
Duncock	BBS	GBW					
Grey Wagtail							
Pied/White Wagtail		GBW					
Meadow Pipit							
Rock Pipit							
Chaffinch	BBS	GBW					
Bullfinch							
Greenfinch	BBS	GBW					
Linnet							
Goldfinch	BBS	GBW					
Cirl Bunting							BGRC

Table 12.2 Gaps in the monitoring of breeding species where, with current effort, it is not possible to produce formal trends – a list of those species that fall out of the systematic monitoring schemes (Breeding Bird Survey, Wetland Bird Survey and the Seabird Monitoring Program) and where all records are collected (rarities committee). GBW – species that are recorded in 50% or more of gardens counted in Garden BirdWatch for which with more data could be monitored. GB – species which are classed scarce or uncommon for which Guernsey Birds might be able to provide sufficient data on breeding numbers. BBS – with more data these species could have trends produced as they just miss the cut-off (an average of 5 squares per year).

Species	Garden BirdWatch	GuernseyBirds	Breeding Bird Survey
Little Grebe		GB	
Sparrowhawk	GBW		
Marsh Harrier			
Buzzard			BBS
Water Rail			
Moorhen			BBS
Coot			BBS
Feral Pigeon			
Stock Dove			BBS
Cuckoo		GB	
Barn Owl			
Long-eared Owl			
Swift			

Species	Garden BirdWatch	GuernseyBirds	Breeding Bird Survey
Great Spotted Woodpecker		GB	
Peregrine			
Jackdaw			
Raven			
Sand Martin			
House Martin			BBS
Cetti's Warbler		GB	
Long-tailed Tit	GBW		BBS
Willow Warbler			
Reed Warbler			
Garden Warbler			
Firecrest			
Goldcrest	GBW		
Short-toed Treecreeper			
Black Redstart		GB	
Stonechat			
Wheatear			
Grey Wagtail			
Pied/White Wagtail	GBW		
Meadow Pipit			BBS
Rock Pipit			
Bullfinch		GB	
Linnet			BBS

12.2 Extra targeted surveys for individual or small groups of species

It is not realistic, or necessarily desirable, to robustly monitor every breeding and wintering species on the islands, and a targeted approach will be required. Some species will be more vulnerable than others (e.g. from persecution or poisoning of raptors, Magpies and Ravens) and others will be rapidly expanding or decreasing their range, for example the apparent rapid expansion of Firecrest as a breeding species has gone largely unnoticed until recently. The species prioritisation exercise (see Section 10) identifies the criteria which can be used to produce a list of priority bird species which can be adapted for other taxa, and this can be used to determine those breeding species left out of any systematic monitoring scheme (Table 12.2) for which monitoring data would be desirable.

Outside of the breeding season, waterbirds are monitored, but other priority resident and migrant species will likely have to be covered by the semi-structured methods of Guernsey Birds/BirdTrack or bespoke methods, such as the targeted aerial surveys suggested for Balearic Shearwaters in the seabirds chapter.

12.3 Demographic monitoring

There are no formal demographic monitoring schemes in the Channel Islands, such as the Nest Records Scheme, Nesting Neighbours and Constant Effort Sites (CES) that operate in the UK. There has not been a history of nest monitoring in Guernsey, but given BTO covers the Channel Islands, it would be possible to include nest monitoring data from Guernsey in future, although discussion would need to be had with the relevant authorities regarding how this would fit in to Section 22 Animal Welfare (Guernsey) Ordinance, 2012 which regulates how licences can be issued for individuals to disturb nests of wild birds for scientific and research purposes.

Bird ringing in the Channel Islands is operated by the Channel Islands Bird Ringing Scheme, which is separate from the Great Britain and Irish Ringing Scheme, administered by BTO. No formal long-term demographic ringing studies, such as a constant effort-type scheme, are undertaken in the Channel Islands, although there are some long-term colour-ringing studies, notably on gulls, that could be used to calculate survival rates and for monitoring. In some cases, ringing has been regularly carried out in the past at specific sites and survival rates could be calculated.

12.4 Monitoring changes in phenology

Planet Guernsey (Casebow 2007) showed how the timing of biological phenomena have been changing in relation with climate change. Many migrant birds are now arriving earlier than before, in some cases the difference can be very large, for example Sand Martins have advanced their arrival time in Guernsey by about six weeks. Sahelian/arid wintering (e.g. Wheatear, Sand Martin) and southern African wintering migrants (e.g. Swallow), have tended to advance their arrival more than those that winter in Central Africa (e.g. Cuckoo, Swift). First observations of individual species in a year will tend to be recorded in Guernsey Birds and BirdTrack and can be used to track changes in arrival times of migrant birds.

12.5 Priority Sites

The 20 BBS squares are, on average, covering habitats and sites that are important for biodiversity and nature conservation, more than would be expected. There are some very clear biases with seven out of nine Sites of Special Significance being wholly or partially included in BBS squares and approximately half of the most important habitats. Conversely, this means that built up areas and gardens tend to be less well represented and the suite of species that can be covered by BBS may well be increased if more of these areas were included or could be covered by a greater number of gardens being surveyed though GBW.

Some of the rarer habitats are unlikely to be adequately surveyed by BBS methodology. This is not surprising since BBS was designed to survey birds in the wider countryside and it largely fulfils that brief in Guernsey as the selection indices for habitats that have an extent of greater than 100 ha were between -0.2 and 0.2 (Chapter 11.3). If data are needed on the rarer habitats (e.g. quarries, freshwater wetland habitats, dune systems) then specific and targeted surveys will need to be carried out using a different more intensive survey methodology.

12.6 Reporting to international conventions

Of the conventions that Guernsey is party to, the Convention on the Conservation of Migratory Species of Wild Animals (CMS), specifically the African-Eurasian Migratory Waterbird Agreement (AEWA) and the Ramsar Convention are the most relevant. Guernsey has two Ramsar sites and breeding seabirds are regularly monitored as part of the national breeding seabird censuses. Waterbirds are counted monthly on the Lihou Ramsar site, but not the Herm and the Humps site, although the latter site has relatively few waterbirds.

The monitoring currently carried out is sufficient to satisfy the reporting requirements of AEWA and Ramsar. Improvements could be made in terms of more frequent seabird censuses and regular, ideally annual, monitoring of productivity and both of these would be a high priority to implement in the future. If WeBS counts could be reinstated on Herm, that would complete the coverage of open coasts in Guernsey and Herm, but unless a volunteer can be found on island, travel from Guernsey would be necessary each month. Given the low numbers of waterbirds wintering in Herm, this is a low priority action.

12.7 Monitoring fit for the future

On a small island with a limited number of people, volunteer-based biological recording schemes may compete with each other and volunteer overload may become an issue. Ideally these recording schemes need to come together and clearly lay out in one place (e.g. through the Biodiversity Partnership or the Guernsey Biological Records Centre) the different surveys that volunteers can take part in and detail the skill levels and time commitments that are required.

13. RECOMMENDATIONS

13.1 Breeding Bird Survey

BBS monitors common breeding terrestrial birds and requires two surveys a year. The current set of data allowed for trends to be produced for 24 species and three habitat specific indicators (farmland, woodland and urban), which is comparable to the UK and England. Starling showed the greatest decline, closely followed by Magpie, Swallow and Greenfinch, with the Goldfinch having the greatest increase over the long-term period (10 years). The All Species indicator overall looks stable, although the long-term increase in woodland cover across the island is perhaps reflected in the increase in the Woodland Indicator and, as per the UK, the Farmland Indicator shows declines.

- To improve trends ensure consistent and sustained annual coverage as many of the 20 allocated BBS squares as possible across the island. This will allow for more robust trends to be calculated and to enable trends to be calculated for other species such as Buzzard, Linnet, Stock Dove, House Martin, Long-tailed Tit, Coot, Moorhen and Meadow Pipit.
- Coverage of the two squares that have only ever been surveyed in one year, will also allow the species recorded there to contribute to the trend analysis when surveyed subsequently.

13.2 Garden BirdWatch

GBW is a scheme for monitoring use of gardens by birds on a weekly basis. Making up a third of the land area of Guernsey, they are a significant habitat in their own right. However, GBW coverage is low and greater uptake and coverage is required to effectively monitor potential bird trends and more detailed usage of gardens throughout the year. This would enable monitoring of birds in gardens and also at other parts of the year not covered by BBS. GBW is an entry level scheme, meaning that little experience or skill is required as a guidebook is usually also provided as part of the scheme. Promotion of this scheme across Guernsey may increase volunteer uptake in other schemes in the long run, or allow less mobile volunteers an opportunity to contribute, and provide valuable information on habitats that are constantly changing and developing from increasing urbanisation.

- Encouraging more volunteers to take part in GBW would complement data from the Breeding Bird Survey and allow additional species to be monitored, particularly at other times of the year, and in underrepresented garden/urban habitats. It would likely bring new volunteers into biological recording as it is an entry level scheme. These volunteers may then go on to be recruited into other schemes.
- Communicating the benefits of GBW membership, particularly as it's free at the moment, to volunteers will be an important factor in improving uptake.

13.3 BirdTrack and Guernsey Birds

Although we have recommended greater uptake of **BirdTrack**, if **Guernsey Birds** could work in conjunction with BirdTrack, this would aid data collection. Tidying up and standardising the location names and the promotion of complete lists would allow for further analysis and monitoring of common species not covered by BBS, Seabird Monitoring Programme and WeBS. Guernsey Birds and BirdTrack are useful for scarcer species and vagrants. Records supplied to BirdTrack can be accessed by the county recorder or other designated person, and can be uploaded to the Guernsey Birds website or database. If the number of BirdTrack records increases then upload/sharing to the Guernsey Birds website could be automated to input the records straight into the website.

Further use of Guernsey Birds data could be made by uploading it to the [European Bird Portal](#) (EBP) which collates records all over Europe to allow for almost real time locations of birds on an interactive map. These data, along with ringing and tracking data, were used in producing the

European Migration Atlas which included among its aims the objective to monitor bird flu outbreaks. The EBP has a longer history of collating and utilising bird records from a range of bird recording systems across Europe, and has the capacity to monitor migration phenology such as arrival and departure times/dates, as well as to investigate the impact of weather and identify large-scale movements. Work is also ongoing in other taxa to make best use out of both the structured and un/semi-structured data by combining it for analysis (Isaac et al. 2020).

- Promote best practice and encourage data sharing across the two schemes, potentially allowing data from both to be integrated for assessing patterns of occupancy.
- Promoting the use of GuernseyBirds or BirdTrack to record complete lists of species which will allow reporting rates and trends to be calculated for some species. This could capture species not covered by BBS, i.e. species that winter or just pass through the islands on migration.
- Develop and maintain a strict, clear and comparable list of site names in the Guernsey Birds database.
- A data clean up to have records in similar locations merged to the defined site list to keep the records tidy and manageable especially for any spatial analysis, or even more accurate locations of sightings, if required.
- Limit the count of species input to whole numbers (or a lower and upper range) to make analysis easier.

13.4 Seabirds

The change in breeding seabird numbers since 1969/1970 is relatively well understood through four national seabird censuses, although data in the JNCC database should be checked with data held locally as it looks like there are some discrepancies. Little is known about seabird breeding success, mortality or their foraging ecology. Participation in the JNCC **Seabird Monitoring Program (SMP)** to record annually (or periodically, e.g. every 3 years) the breeding success of the Bailiwick's seabirds is recommended. This is already undertaken in Alderney and a combined Bailiwick, or Channel Island, approach is recommended. Additional GPS tracking studies will better inform where important feeding areas are for breeding seabirds.

Little is known about the importance of the Bailiwick's waters for seabirds outside the breeding season, although during spring and autumn, counts of migrating seabirds are made on seawatches from coastal headlands by birders. These data are captured in Guernsey Birds and other online databases. One notable change has been the appearance, since 2014, of large rafts (up to c. 3,000) of Balearic Shearwaters off the southwest and northwest coasts of Guernsey. At times Guernsey waters have been shown to hold 15% of the global population of this species. Being observed from shore, an aerial survey of these would improve the estimate of the numbers present.

Mammalian predators (rats, cats, ferret/polecats) are present in seabird colonies. The impact of these is undocumented but will undoubtedly be having an effect on breeding success. Eradications of rats on other islands (e.g. Lundy, St Agnes and the Shiant Islands) has shown a large increase in the number of, and species breeding there. It is recommended that rat eradication or suppression programs should be scoped for the smaller islands in the Bailiwick.

- **Data storage and checking**
 - The national seabird database needs checking against data held locally, and updating with more detailed count data where available.

- Data should be held centrally, ideally at the Guernsey Biological Records Centre.
- **Monitoring of breeding populations**
 - Ensuring continuity by taking part in the national censuses is a high priority.
 - Additional annual censuses in between the national censuses as part of a wider Ramsar monitoring strategy, which could also be extended to areas outside the boundaries of the two Ramsar sites in Guernsey.
 - A coordinated Manx Shearwater survey in conjunction with Sark and Alderney possibly using acoustic recorders to identify possible breeding areas, followed up with burrow surveys.
 - Ideally annual breeding success data should be collected using the methodology in Walsh et al. (2005).
 - Annual reports on the data collection and a 6-year review document, with plans for the next 6-year period should be produced.
 - A review of the current seabird ringing for monitoring the Ramsar sites. Assess the feasibility of additional colour-ringing and follow up observation studies for each of the key seabird species to provide data on survival rates, immigration and emigration to better understand the underlying demographic causes of the observed population change. Analysis of existing gull colour-ringing data to estimate annual survival would inform the design of any new studies.
- **Non-breeding seabirds**
 - Undertake an initial baseline survey of Balearic Shearwater using high definition still or video photography of Bailiwick waters using standard aerial surveying methodology to better understand the spatial and temporal use of Guernsey's territorial waters by this Critically Endangered species.
 - An initial project to collate and curate sea watch data, with the data being logged at the Guernsey Biological Records Centre.
- **Monitoring of non-native invasive species**
 - Undertake, as part of any Ramsar monitoring plan, periodic monitoring of the non-native mammalian predators of seabirds (rats, ferrets and cats), using camera traps, hair tubes, chew sticks, but also acoustic detectors for rats.
 - Rat eradications would be desirable on some islands and islets but it is recognised that these will be difficult and expensive to carry out. Targeted reduction programs using poisoned baits in the early spring before the breeding seabirds return could be used to preserve important colonies. This has, for example, reduced rat predation of tern eggs in a colony in Alderney. Examples of potential colonies include Jethou, Lihou, some of the small islets that are exposed at low tide off Herm (e.g. Hermetier, Le Plat Houmet) and Brehon Tower, if rats are found to be present there.

13.5 WeBS

Although Guernsey does not play host to large numbers of wintering waterbirds, analysis of the data collected under the **WeBS** Core Count scheme has demonstrated that it is possible to index numbers and describe trends for the Guernsey Shore winter populations of at least the more numerous species. Furthermore, the resulting trends are generally smooth enough to allow the severity of any declines to be quantified following the methodology of the WeBS Alerts system. A total of 19 species have been recorded annually in sufficient numbers to support further detailed trend analysis for

both Guernsey and the Channel Islands as a whole, and WeBS Alert status (Red, Amber or Green depending on trend).

Many of the wader species have been declining on Guernsey following similar patterns to the rest of the Channel Islands and the UK, with the exception of Turnstone which have declined more rapidly on Guernsey.

There is also scope to monitor the overall situation through a Winter Waterbird Indicator (a multiple species index) following the methodology that is used by the BTO to provide annually updated Winter Waterbird Indicators for the UK, England and Scotland. We recommend wintering waterbird indices are produced on a regular basis for Guernsey e.g. annually as for the UK, Great Britain, and the devolved countries and updating the wintering waterbird indicator. Analysis following the WeBS Alerts approach should be repeated on a regular basis, such as every three years.

- We recommend wintering waterbird indices and an overall wader indicator are calculated on an annual basis for Guernsey.
- We recommend that analysis following the WeBS Alerts approach be repeated on a regular basis. Alert updates for SPAs, SSSIs and ASSIs in Northern Ireland, Scotland, Wales and England were published in 2013 and 2019 with a review for the need for an update to be considered after three years.

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A review of the capacity of current avian monitoring schemes in Guernsey to assess the population status of breeding and wintering bird species

The Strategy for Nature in Guernsey delivers a clear policy driver to establish baselines for key biodiversity groups to provide government, other policy makers and practitioners the biodiversity information required for good decision making and fulfilling obligations under international agreements (e.g. Ramsar, the Convention on Migratory Species' African-Eurasian Waterbird Agreement etc.).

In this report, we summarise the different long-term avian monitoring schemes taking place in Guernsey and Herm and, where sufficient data exist, undertake an analysis to produce trends in species breeding or wintering populations. We assess whether the monitoring schemes are sufficient to fulfil local (Bailiwick), national (UK) and international reporting requirements, and make recommendations for improving schemes. We undertake a gap analysis and identify priority species that are not covered by an existing scheme and make recommendations for setting up a program of single species surveys which fall outside current monitoring schemes.

Barnes, A.E., Noble, D.G., Austin, G.E. & Atkinson, P.W. (2022). A review of the capacity of current avian monitoring schemes in Guernsey to assess the population status of breeding and wintering bird species. BTO Research Report 742.

ISBN 978-1-912642-33-5



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