Wild Warwickshire

Support Document for Warwickshire's Ornithological Local Biodiversity Action Plans

Mark C Smith
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Acknowledgements

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Contents

Abbreviations

BBS – Breeding Bird Survey

BTO – British Trust for Ornithology

DEFRA – Department for Food and Rural Affairs

EN – English Nature

FWAG – Farming and Wildlife Advisory Group

LBAP – Local Biodiversity Action Plan

LWT – Local Wildlife Trust

NBWM – New Birds of the West Midlands

NFU – National Farmers Union

RSPB – Royal Society for the Protection of Birds

WeBS – Wetland Bird Survey

WCC – Warwickshire County Council

WMBC – West Midland Bird Club

WWT – Warwickshire Wildlife Trust

Summary

Warwickshire has a diversity of landscapes that supports a rich flora and fauna. Many of these species have declined in the past 50 years.
The county has highlighted 9 bird species to be covered by LBAP's (Barn Owl, Corn Bunting, Bittern, Song Thrush, Snipe, Lapwing, Tree Sparrow and Skylark) to counter these changes. Several of these species are also covered in neighbouring counties creating a wider network of conservation efforts.

There is currently too little coverage by the BTO's Breeding Bird Survey on which to assess bird numbers and changes in the county however upcoming projects may solve this. The Tetrad Atlas and the BTO Atlas work beginning in 2007 should help plug the information gap and yield excellent data on species distribution in the county.

For almost all the species there exist two strongholds in the county. The very northern tip and the southeastern border of Warwickshire seem to have the greatest concentrations of breeding pairs of all the species in question. The north and its network of lakes and rivers is particularly important for Snipe and Lapwing whilst the farmland on the Warwickshire/Oxfordshire border is a stronghold for Corn Bunting and Tree Sparrows.

Warwickshire benefits from having an important site for wintering Bittern. Both Ladywalk and Brandon Marsh regularly have individuals spending the winter. It is hoped that with the correct management these individuals could be persuade to stay and breed, at least at Ladywalk where numbers are higher.

The Song Thrush whilst increasing in numbers is highly under represented in the literature and survey work. It is likely that a specific targeted survey will be required to fully assess the distribution and population of this species.
It is suggested that a series of staggered surveys be made to reinforce our understanding of the avian ecology of the county. Specifically, a Farmland Bird survey would help fill the current information gap.

Section 1 - Introduction

This project has been written to increase the amount of scientific support available to the avian Local Biodiversity Action Plans. Graham Harrison wrote LBAPS for each of the 9 bird species in 2003. They followed the accepted structure with species protection and information. They set targets and drew together partnership groups to enact measures to improve their status. This report is designed to support and supplement those action plans to better enable their understanding and implementation.

This document is structured on a species by species basis. Each species is assessed and as much relevant information as was available presented.

Aims

1. Assess the current coverage of Bird data collection in the county.
2. To collate county records from WMBC Annual Reports to give some idea of species populations and distributions.
3. Review recent literature on the key species and explore the actions taken by neighbouring counties.
4. Attempt to establish a baseline and suggest a monitoring scheme that is appropriate for each species

The County of Warwickshire

Warwickshire is at the heart of England; it is 197,854ha in size and boasts a range of habitats. Much of the county was once part of the forests of Arden and Mercia unfortunately almost all of this woodland has since been lost. The landscape is essentially a rural one. At one time Coventry was within its borders but after it was moved into the West Midlands Warwickshire was left with no city. Main conurbations include Warwick and Leamington in the centre and Nuneaton and Bedworth to the North. Other key urban areas are Stratford upon Avon, Rugby, Henley in Arden and Shipston on Stour.

Up until the 1940's much of Warwickshire was traditionally farmed with a four-year rotation of root, oat/barley, grass ley and wheat crops (Harrison and Harrison, 2005). This system supported itself maintaining nutrient inputs and created a range of habitats for a variety of species. During the war and into the 1950's much of the county became poorly managed marginal land reverted to permanent pastures, hedges overgrew and ditches silted up. As mechanisation stepped up a gear new agricultural opportunities were revealed. Flower rich grasslands, once inaccessible could now be worked. Hedges were removed to increase field sizes and room for this large machinery. Ditches were filled in and wetlands and ponds drained. Traditional rotations were abandoned as fertilisers, pesticides and insecticides boosted crop productivity (Harrison and Harrison, 2005).

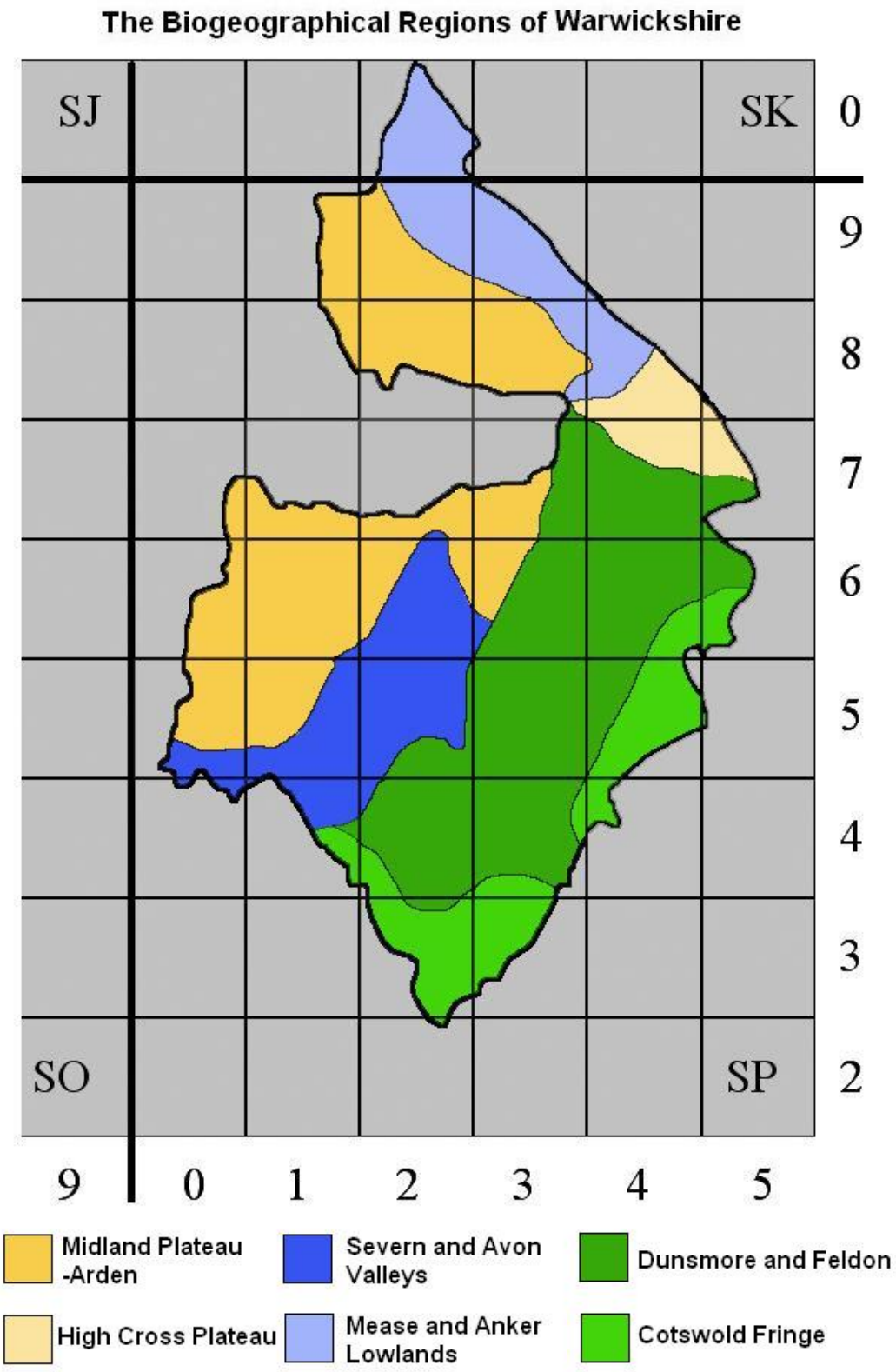
In 2003 the biogeography of Warwickshire is a reflection of many of these changes. The county boasts 29% permanent grassland with 66% of its landmass being under cultivation mainly in the Dunsmore and Feldon regions.

The biogeographical make up of Warwickshire can be seen in Figure 1 and is adapted from Harrison and Harrisons (2005) descriptions in 'The New Birds of the West The Mease and Anker Lowlands are typified by Claylands, it is sparsely populated with arable farms with low hedges with few trees. The enclosures closely mirror their origins in the 18th and 19th century and are rectilinear. The landscape is punctuated by copses and spinneys and divided by ridges and streams. South-east is the High Cross Plateau. This region is upland and is the watershed between the Avon and Soar. Light well-drained soils give way to clays in the valleys. Fields are enclosed with hedges with few trees.

Across Coventry and Kenilworth down to Henley in Arden is the Arden Midland Plateau. Here the Alne, Avon, Arrow, Tame and Anker all flow through a matrix of Triassic mudstones and Arden sandstones. Much of the Forest is gone. The fields here are irregular with thick hedges some remnant of the forests. This region is the most densely populated and conurbated.

The central north south region is the Dunsmore and Feldon region. This area is underlain with calcareous lias clays with patches of glacial gravels and acidic soils. The rivers Avon and Leam are the main water features. Midlands'.

Figure 1. The Biogeographical Regions of Warwickshire



Dunsmore is similar in character to Arden with acidic soils that once would have been heathland. Woodlands in and around Princethorpe form the counties greatest network of semi-natural woodland. The fields are flat and open and usually large and rectangular. Feldon is an open clay vale through, which the Leam and the Stour flow. The landscape has typical enclosures of regular fields.

To the west of Dunsmore and Feldon encompassing Warwick and Stratford upon Avon is the Severn and Avon Valleys region. This region has underlying Mercia mudstones yielding heavy clays. The Avon is the main watercourse and crosses the whole region. Enclosures are large and open and can be nutrient deficient.

The last region in Warwickshire is the Cotswold Fringe that edges the south and the south east borders of the county. This region is comprised of Jurassic hills and an extensive upland plateau. The Hills at Illmington and Long Compton are oolitic limestone with lias shales, silt stones and sandstones. The hilltops in this region are particularly noted as good observation points for spotting migratory birds.

Survey coverage in the County.

The number of surveys conducted on birds in the county is a difficult thing to quantify. The BTO regularly surveys a number of different of species and habitats each season but in proportion to the size of the county this data is incredibly small. Other organisations such as the WMBC and WWT undertake local studies on their reserves but rarely any wider. Current coverage is shown in Figure 2.

Methodology

This report takes a species by species approach. Each LBAP Species is treated individually with species data, distributions, baselines and monitoring suggestions. Data is drawn from as up to date literature as could be found. Greater detail of how the data was collected and manipulated is detailed before the species accounts.

Figure 2. Table illustrating the number and types of surveys and bird recording currently being made in the county.

Survey	Organiser	Target	Range	Coverage	Information
Breeding Bird Survey	BTO	All Breeding Birds	County Wide	17, 1km squares (2006)	2 timed transect visits.
Waterways Breeding Bird Survey	BTO	All Breeding Birds	County Wide	1, 5km stretch (2006)	2 timed transect visits
Tawny Owl Survey	BTO	Tawny Owls	Stratford (SP25)	25 Tetrads	2 late night visits
Wetland Bird Survey	BTO	All Wetland Species	County Wide	12 sites	Year round monthly visits
Birdtrack	BTO/RSPB	All species	County Wide	Unknown	Casual records – forwarded to County Recorder
Scarce Woodland Bird Survey	BTO	All woodland Species	County Wide	6 woods in 2005	2 timed transect visits
Winter Farmland Birds Survey	RSPB/BTO	All Farmland Birds	County Wide/National	21, 1km squares in 3 years. 1999-03	Limited coverage. Only 6 squares surveyed at least once.
County Recorder	WMBC	All Species	County Wide	Unknown	All vetted records
Farmland Bird Surveys	RSPB/BTO	All Species	National	6, 1 km squares	Winter survey 1999-2002
Covey Counts	Game Conservancy Council	Game Birds	Unknown	Unknown	Unknown
Tetrad Atlas	Jonathon Bowley	All species	County Wide	County	Currently in Production

LBAP Coverage in Neighbouring Counties

Warwickshire currently has 9 species of birds with LBAP's. These species are a range of scare and rare birds to those that are more common but declining. Gloucestershire has the greatest number of species covered by an LBAP with 13 species and unusually Oxfordshire has none. The species are generally nationally rare or scarce species and those at risk in each home county.

Five other counties also cover all 9 of Warwickshire's species. Often problems can occur where species are less well protected for in neighbouring regions. The fact that all the species are covered in many of Warwickshire's neighbours means that some regional level stabilisation could be seen. The species most covered are the Barn Owl, Grey Partridge, Skylark and Tree Sparrow. Figure 3 shows which species are covered in the wider region.

Figure 3 Table illustrating Coverage of LBAP's in neighbouring counties.

	Warwickshire	Worcestershire	Gloucestershire	Birmingham/Black Country	Staffordshire	Oxfordshire	Northamptonshire	Leicestershire	Total
Barn Owl	■				■		■	■	4
Bittern	■		■						2
Black Redstart				▒					1
Bullfinch			▒		▒				2
Corn Bunting	■		■		■				3
Grey Partridge	■		■	■	■		■		5
Lapwing	■				■				2
Linnet			▒						2
Marsh Warbler		▒							1
Nightingale		▒					▒	▒	3
Nightjar			▒						2
Redstart								▒	1
Reed Bunting			▒						1
Sand Martin								▒	1
Skylark	■		■	■	■				4
Snipe	■				■				2
Song Thrush	■		■	■					3
Spotted Flycatcher			▒						1
Tree Sparrow	■		■	■	■				4
Turtle Dove			▒						1
Woodlark			▒		▒				2
Total	9	2	13	5	11	0	3	4	

Section 2 - Individual Species Accounts

Explanatory Notes on Species Accounts

Full accounts of all species covered by an LBAP in Warwickshire are included in this document.

Status: Notes whether the species appears on Categories A, B or C of the British Ornithologists Union British List.

Regional Status: Notes a brief assessment of local status including abundance. Based on WMBC and NBWM (Harrison and Harrison, 2005).

Index of Abundance: Represents an approximate assessment of non-breeding abundance in England. Scale = 9: Extremely Abundant (+1 million individuals); 8: Abundant (100,001 – 1 million individuals); 7: Common (10,001 - 100,000); 6:Uncommon (1001-10,000 individuals); 5: Scarce (101 – 1001 individuals) and 4: Rare (fewer than 100 individuals).

Population Estimates: The most up to date population estimate has been sought and a brief explanation of population changes in the last 100 years has been made.

National Distribution: A statistical rather than geographical assessment the figure provided is based on work by Donald (1995). The figure used represents a species occurrence in 10km squares between 1988 and 1991. It is used to give an estimation of range.

Protection and Legal Notes: A brief over view of protection/risk classification at both the International and National levels (Species of European Conservation Concern and Birds of Conservation Concern in the UK).

Species Information: Designed to give some idea of a species habits and breeding practices. This section aims to include the latest figures for breeding parameters such as clutch size and survival rates.

Habitat Information: Collected from various sources a description of optimal habitats is made for General, Breeding and Non-breeding seasons.

Food Availability and Migration: This section outlines feeding requirements and migratory patterns.

Causes of Decline: A brief examination of the recent literature relating to why the species are in decline and what factors may aid recovery.

Beneficial Management: A simple range of suggestions for reversing declines. All suggestions are rudimentary and drawn from recent literature and may not be practical on a countywide basis.

County Distribution and Baselines: County Distribution is explored in great detail and examines a variety of sources. Data from the WMBC, BBS and WeBS were all sought and presented where appropriate.

Distribution maps and some graphs were drawn from data extracted from WMBC Annual Bird Reports. A period of 15 years was studied (1988-2003). Data was taken from individual species accounts and therein lies its limitations.

The Annual Bird Report does not necessarily include every observation sent to the county recorder and is sometimes more of an overview of breeding success or winter flock size. Often there is a bias related to who submits data and where the frequent giving some regions in the county better coverage than others. Additionally there is the bias arising from the actual submitter. Not all submitters will submit a sighting report for every bird seen. It is more likely that a rare bird such as Bittern or Barn Owl will always be entered whereas a bird perceived to be more common such as the Song Thrush or Skylark is less well documented.

It is therefore with these caveats in mind that all data taken from the WMBC must be viewed only as indicative and not conclusive in lieu of more detailed surveys. They represent a minimum population size and distribution.

Coverage in Warwickshire of the BBS is exceptionally low; from 2000 to 2003 only 4 1km squares were surveyed per annum. This value is on the rise with an expected 15-17 squares this season (2006). At the BTO it is suggested that coverage of at least 50 squares is needed for data to begin to be viable and much higher for them to be statistically sound. With a confidence interval of 10% and a confidence level of 95% 91 1km squares would need to be surveyed to be statistically sound.
In all cases it was decided not to include BBS data from Warwickshire, data instead from a broader regional level was used. Information concerning the West Midlands was used to represent this region and compared to English and British figures. Most results were converted to indices from 1994 (the start of the BBS).
A particular problem with the BBS data set was the distortion caused by the Foot and Mouth Crisis of 2001. Given that only a tiny fraction of sites were surveyed and that those were heavily biased towards urban and suburban sites it was decided to discount the 2001 data as unrepresentative.

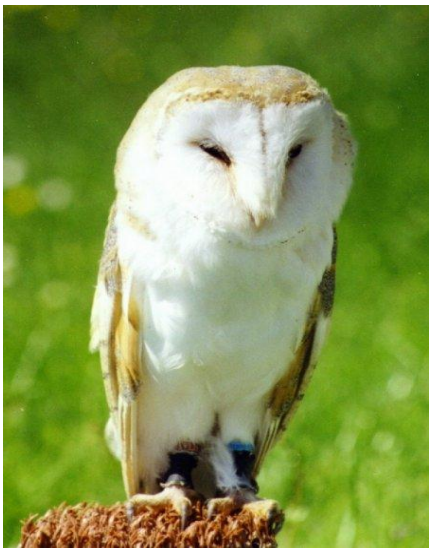
Data from the BTO's WeBS was obtained for those species that were covered in its survey practices, namely Snipe and Lapwing. The range of this data is much smaller than the other data with only a 4-year spread of data (2000-2003). The information highlights species strongholds and given its month-by-month collection process can be useful in assessing changing patterns through the year.

Baselines were given where appropriate. These maybe a range of core sites where there is good historic recording of a species presence or a site that is a particular stronghold for that species.

Monitoring: This section attempts to suggest suitable survey techniques and methods for continuing to monitor baselines, to establish new and more

meaningful baselines and to enable a way to assess the relative success of the species and the effect of action plans upon them.

BARN OWL (*Tyto alba)*



STATUS INFORMATION

Status:

A – Species recorded naturally since 1950 (Brown and Grice, 2005)

Regional Status:

Frequent Declined Resident (Harrison and Harrison, 2005)

Index of Abundance:

6 - Uncommon

Population Estimates: 4,000 pairs 1995-7 best estimate. (Baker et al, 2006)

In the 1930's the population for England and Wales was estimated at 12,000 pairs. The 1968-72 BTO Atlas measured the population at only 4,500-9000 pairs (Toms et al, 2001). A further decline of some 38% occurred between the two atlases with a population estimate of 2790-5,580 pairs in 1982 (Brown and Grice, 2005)

National Distribution:

Nationally the Barn Owl is found to breed in 53% of all 10km squares in England (Brown and Grice, 2005)

SPEC Category:

Category 3 – Population whilst not concentrated in Europe have an unfavourable conservation status.

EU Threat Category

Declining

UK Conservation List:

Amber – Medium conservation concern.

Legal Protection:

Wildlife and Countryside Act 1982 Schedule 1(I), 3(I) and 9

SPECIES INFORMATION

Social Organisation: Territorial (Wernham et al, 2002)

Age at First Breeding: 1 (Wernham et al, 2002)

Breeding Season: April and runs for 27 weeks (Wernham et al, 2002)

Barn Owl form pairs and once a suitable nest site has been secured will raise up to 2 broods in a season (Wernham et al, 2002). Average Clutch size is 5 eggs although current productivity data is showing a lower mean figure of only 4.3 eggs per clutch (Baillie, et al, 2005)

Breeding Dispersal Distance:

Mean distance of up to 16.9 km (Wernham et al, 2002)

Natal Dispersal Distance:

Mean distance of up to 36.6 km (Wernham et al, 2002)

Survival Rate: 0.631 (Wernham et al, 2002)

HABITAT INFORMATION

General Habitat:

The Barn Owl frequents agricultural regions with open areas of a mosaic of permanent grassland with linear features such as hedges and field margins (Kirby et al, 2000); early successional vegetation and young conifer plantations (Toms et al, 2001).

It has been found that areas with unrestricted views of over 300m are favoured for hunting purposes (Kirby et al, 2000).

Breeding Habitat:

Barn Owls predominantly nest in buildings. They require access to a variety of buildings but as the name suggests barns are often favoured the greatest (Kirby et al, 2000). Studies have demonstrated that 69% of pair breed in buildings of which 70% of these were of agricultural use. Only 27% of pairs nested in tree cavities (Brown and Grice, 2005).

FEEDING AND BEHAVIOUR INFORMATION

Food Requirements:

Barn Owls feed on live mammals, birds, reptiles and amphibians (Kirby et al, 2000). During breeding owls will forage up to 2km from the nest rising to up to

4-5km during the winter (Brown and Grice, 2005).

Hunting takes place 1-2 hours before sunset and after sunrise at a height of only 1.5-4.5m (Snow and Perrins, 1998).

Migratory Habits:

Barn Owls are essentially sedentary birds although post-fledging dispersal can be up to 12km (Brown and Grice, 2005).

CAUSES OF DECLINE

The Barn Owl has been in steady decline since the 1930's (Toms et al, 2001). The reasons for this are closely linked to changes in farming practices resulting in large cultivations of cereal crops and less unimproved grassland, which reduce mammal populations.

The increasing trend for the demolition or renovation of old barns and farm buildings along with unsuitable modern constructs has contributed to a net loss of suitable nest sites.

Studies concerning Barn Owl mortality have shown that 44.7% of all deaths in the study were as a result of car collisions. Barn Owls hunt at a low height and are often struck as the cross roads between fields (Toms et al, 2001).

Regionally, the severe winter of 1962/63 was noted to have a significant adverse impact on the Barn Owl (Lord and Munns, 1968).

BENFECIAL MANAGEMENT

Protection of Barns

Introduction of more nest boxes.

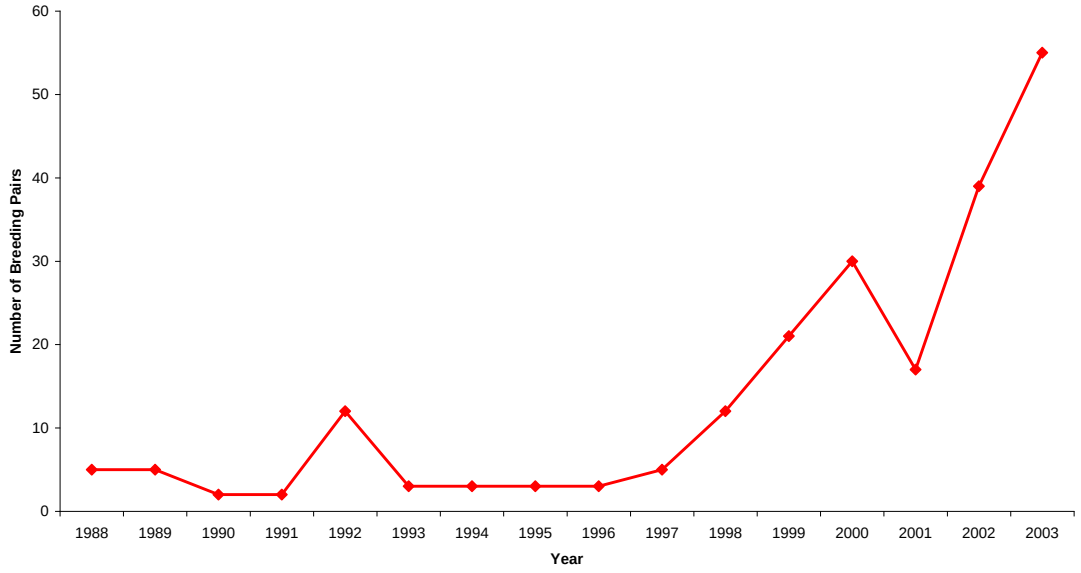
Rotation of crops and greater set aside of unimproved grassland.

COUNTY DISTRIBUTION AND BASELINES

In 1947 in Warwickshire the Barn Owl was listed as a Scarce Local Resident (Norris, 1947). More recently in Warwickshire there has been a steady increase in the number of breeding adults (Fig 4).

Figure 4. The Number of Breeding Barn Owls in Warwickshire between 1988 and 2003 (WMBC).

Graph illustrating the number of breeding Barn Owls in Warwcikshire between 1988 and 2003.
Data collated from WMBC Annual Reports (WMBC)



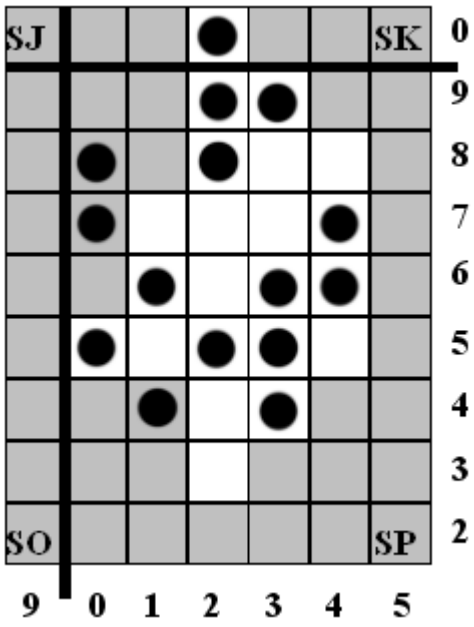
The number of pairs has increased from 5 to approximately 50 over the past 15 years. The increase was slow to begin with but real gains were made from 1997 onwards (Fig 4).

Barn Owl distribution has likewise changed the following maps (Fig 5) illustrate changes in distribution. There has been a slight broadening of range since 1966-68 with its greatest distribution being in the 1993-97 time frame.

Barn Owls enjoy a particular status to birdwatchers and the uninitiated alike. Most people are aware of them and the chance that a sighting is logged is greater than many other species. Efforts by the Hawk and Owl Trust and the BTO's Barn Owl Monitoring Project suggest that this species is comprehensively studied. The extent to which that is so in Warwickshire is less well known. The data for the last 15 years from WMBC records constitute a reasonably sound baseline upon which to base future assessments into species success and recovery.

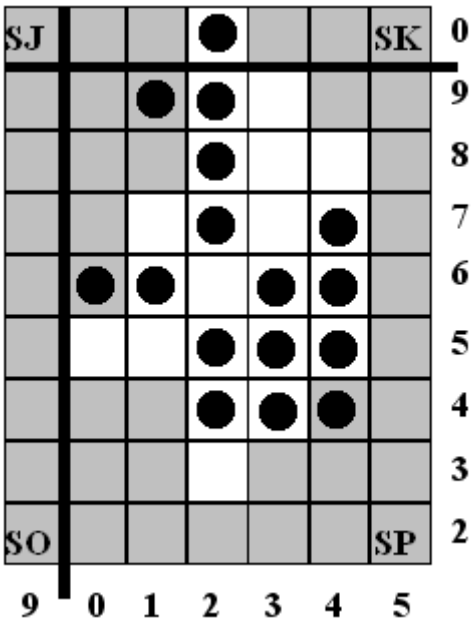
Figure 5. The Distribution of Barn Owls in Warwickshire

1966-1968



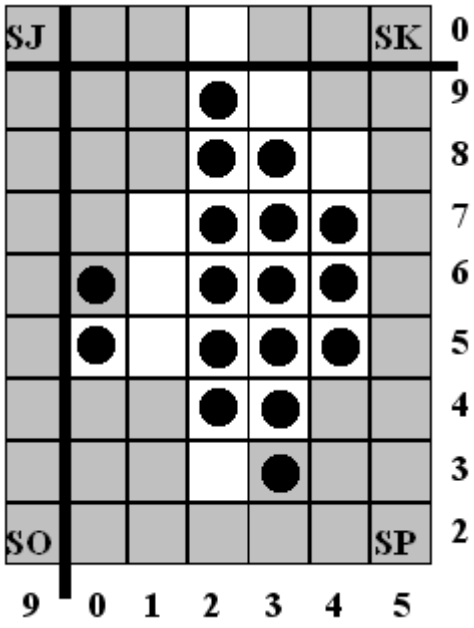
Breeding
(After Lord and Munns, 1968)

1988-1992



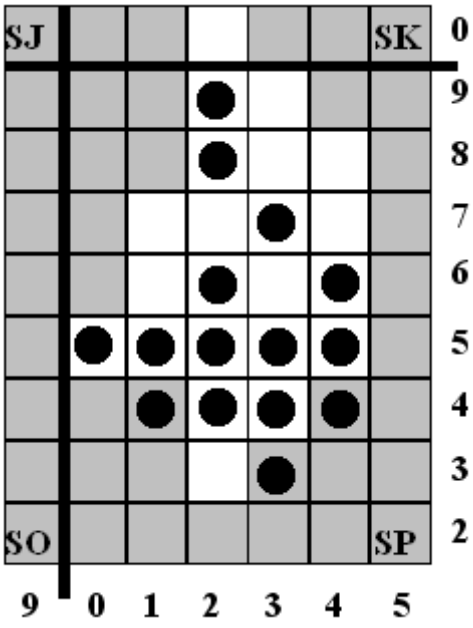
Year Round Records
(WMBC Annual Reports)

1993-1997



Year Round Records
(WMBC Annual Reports)

1998-2003



Year Round Records
(WMBC Annual Reports)

MONITORING

There was a 3-year breeding survey from 1994 and 1997 conducted by the BTO and the Hawk and Owl Trust (Gilbert et al, 1998). An assessment of breeding populations is based on the appraisal of the number of potential breeding Barn Owl sites. The survey entails visits to a target area to mark out potential nest sites over winter and in the summer. Any breeding season visits require the surveyor to have a Schedule 1 licence.

A full survey of the county is not necessarily practical. The Barn Owl benefits from a high status and so most sightings will be logged with the County Recorder. This represents a simple if somewhat woolly monitoring regime. The Barn Owl Monitoring Programme run by the BTO and the work of the Hawk and Owl Trust are probably better avenues to explore. The BTO has regular data from the Nest Record Scheme and it would be advantageous to find out if possible what records for Warwickshire they hold and to whether the data they collect could be used to assess the species progress over time.

EURASIAN BITTERN (Botura stellarius)

STATUS INFORMATION

Status:

A - Species recorded naturally since 1950 (Brown and Grice, 2005).

Regional Status:

Scarce Winter Visitor and Rare summer visitor (Harrison and Harrison, 2005).

Index of Abundance:

4-5 – Rare annual species/ Scarce

Population Estimates: 21 pairs (Baillie, 2005); 28 males 1998-2002 best estimate with 50-150 individuals wintering (Baker et al, 2006).

The Bittern is widespread in Europe, North Africa and Central and East Asia. Russia holds approximately three quarters of the western palearctic population (20,000-42,000 pairs)(Snow and Perrins, 1998).

The Bittern has declined throughout its range with France and the Netherlands only having 100 pairs between them (Brown and Grice, 2005). There has been some success in the UK and it is estimated that there are currently 40 pairs in the British isles twice as many as in 1994 (Snow and Perrins, 1998).

There is currently a drive to reach a target of 100 individuals by 2020 (Brown and Grice, 2005).

The latest BTO estimates suggest there are a breeding population of 21 pairs and a wintering population of 100 (Baillie, 2005) representing approximately 1% of the EU breeding population (Wernham et al, 2002).

National Distribution:

Present in 1% of 10km squares 1988-1991 (Brown and Grice, 2005)

SPEC Category:

3 – Whose population whilst not concentrated within Europe have unfavourable conservation status.

EU Threat Category

V – Vulnerable

UK Conservation List:

Red – High Conservation Concern >50% decline.

Legal Protection:

EU Birds Directive Schedule I and Wildlife and Countryside Act 1981 Schedule I (I)

SPECIES INFORMATION

Breeding Season:

Bittern raise one brood per season with between 4 and 6 eggs per clutch (Baillies, 2005)

HABITAT INFORMATION

General Habitat:

Bitterns inhabit lowland swamps below 200m altitude in shallow standing water (Snow and Perrins, 1998). They require tall emergent vegetation especially reed-beds. Ditches, predominantly with shallow margins up to 2.5m deep with deep channels of up to 1.5m wide and 1m deep are favoured. Larger bodies of water require 5m wide shallow margins on at least one side (Kirby et al, 2000).

FEEDING AND BEHAVIOUR INFORMATION

Food Requirements:

Bittern are solitary and crepuscular/daytime feeders. They wade in shallow margins up to 10-25cm deep to catch fish and amphibians (Kirby et al, 2000). Their primary food is Eels (Brown and Grice, 2005).

Migratory Habits:

No British tagged birds have been recorded overseas although there is evidence of a general movement of Bittern population's south-westerly within Europe (Wernham et al, 2002). There is currently too little data to say with any accuracy where British populations move to and from. It is expected that they travel from the low countries, Sweden and Germany (Wernham et al, 2002).

CAUSES OF DECLINE

Natural succession and the draining of reed beds and marshes severely constricted the range of the Bittern (Brown and Grice, 2005).

Bitterns are also sensitive to changes in food availability due to watercourses becoming polluted with heavy metals and pesticides. Both of these can be compounded by the problem of bio-accumulation in their primary prey of Eels (Brown and Grice, 2005).

BENFECIAL MANAGEMENT

There are 4 individuals that winter at Ladywalk and it would help spread the population if these could be persuaded to remain and breed at the site (See Figure 6). It maybe that the individuals wintering in the county are all of one sex and thereby limiting the chances of breeding, however if number continue to rise year on year then this chance increases. Therefore efforts should be made at Ladywalk to improve the habitat in line with the optimum requirement for Bittern.

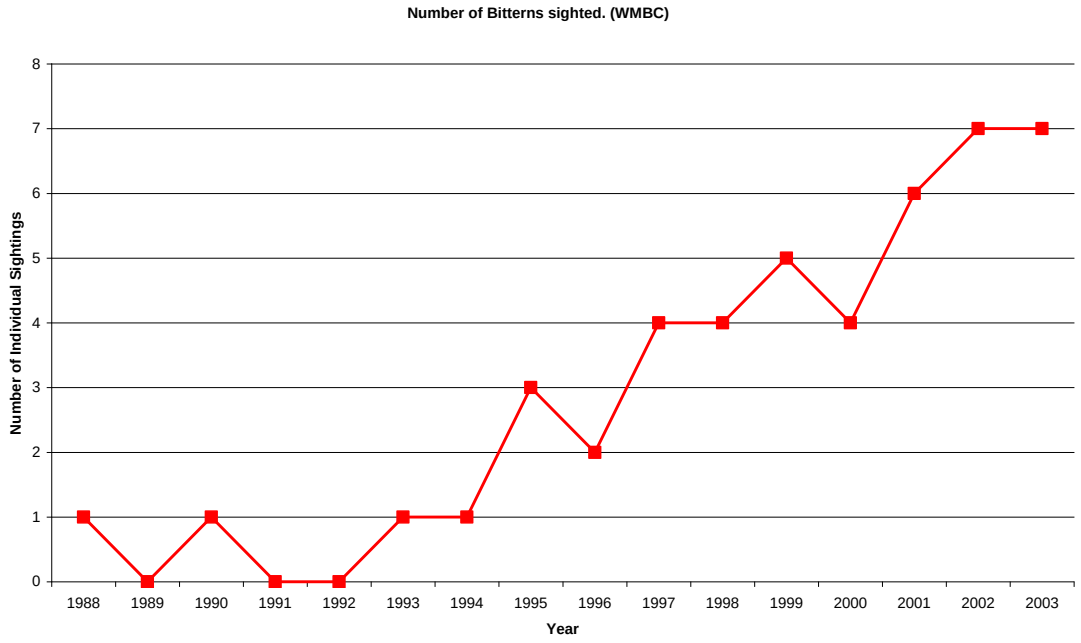
COUNTY DISTRIBUTION / BASELINES

Nationally the Bittern has been the focus of great efforts to improve numbers since their return from extinction in the country in 1911. The number of Bittern seen each year in the county has steadily increased over the past 15 years

So far there have been no reports of breeding in Warwickshire despite the county now attracting regular visits during the winter.

Figure 6 shows the number of Bittern sightings over time and shows that numbers have increased steadily since 1992 with a peak of up to 7 individuals wintering in the county each year, which represents 7% of the national winter population.

Figure 6. The Number of Bitterns recorded annually since 1988 (WMBC)



On the whole the Bittern arrive in the county in late November/December and leave in March, there has however been records of Bittern present as late as May at Brandon.

Bittern have been sighted at Bidford, Brandon, Coombe, Dosthill, Kingsbury, Ladywalk, Lower Radbourn, Middleton, Napton, Priors Marston and Wolston. Of these sites the two best are Brandon and Ladywalk with a greater frequency of visits starting to occur at Napton Reservoir (Fig 5). Ladywalk was the site of the counties first record in 1979 (WMBC, 2002).

Baseline

Bitterns are so rare in the county and the country as a whole that the establishment of any specific survey would essential yield very little. It is suggested that the strength of the presence of individuals at Ladywalk and Brandon is the best way to monitor and improve the status of this bird. The records from the WMBC provide a baseline for the past 15 years and show the potential for both these sites becoming ideally breeding locations. It is recommended that all records of Bittern at these sites be submitted to enable a full assessment of their arrival and departure dates.

Figure 7. Table showing the numbers of Bittern at key sites.

	Brandon	Ladywalk	Napton
1988	0	1	0
1989	0	0	0
1990	0	1	0
1991	0	0	0
1992	0	0	0
1993	0	1	0
1994	0	1	0
1995	1	1	0
1996	1	1	0
1997	1	2	0
1998	1	2	0
1999	1	3	0
2000	1	3	0
2001	1	3	0
2002	1	4	1
2003	1	4	1

MONITORING

The general methodology for monitoring Bittern populations is a three-visit survey between April and May to locate booming males. Such a survey will require a Schedule 1 licence (Gilbert et al, 1998). This is essentially a very simple technique but given the current number of Bittern in Warwickshire and that they are currently only winter visitors long term monitoring would be better targeted on establishing distribution and time spent in the county rather than necessarily numbers.

The Bittern frequent the core reed bed locations in the county namely Ladywalk, Brandon Marsh and Napton Reservior. It is perhaps better for the next few years to establish exactly when Bitterns arrive at these sites and for how long they stay to establish if any are in fact staying into the breeding season.

It would be beneficial to assess what other suitable sites are available in the county and to set up a mechanism for checking these sites in the winter months, although any formal survey would be highly hit and miss given the rarity of the individual.

CORN BUNTING (*Emberiza callandra)*

STATUS INFORMATION

Status:

A – Species recorded naturally since 1950 (Brown and Grice, 2005).

Regional Status:

Fairly common though much declined resident (Harrison and Harrison, 2005).

Index of Abundance: 8 –Abundant (Brown and Grice, 2005)

Population Estimates: 8,500-12,200 territories in 2000 (best estimate) (Baker et al, 2006).

Several studies have shown remarkable declines in this species. In 1997/98 278 singing males were detected in 10 tetrads this figure fell by 39% by 2004 (Mason, 2005). Research on the South Downs highlighted a 65% decline between 1970 and 1992 (Ward and Aebischer, 1994).

80% of the UK breeding population is solely within England (Brown and Grice, 2005).

National Distribution:

Present in 52% of 10km squares in 1988-91 (Brown and Grice, 2005).

SPEC Category:

4 – Populations are concentrated in Europe and have favourable conservation status (Brown and Grice, 2005).

EU Threat Category

None

UK Conservation List:

Red – High Conservation Concern. >50% population decline (Baillies et al, 2005).

SPECIES INFORMATION

Social Organisation: Territorial in Breeding Season. Gregarious out of season (Snow and Perrins, 1998).

Breeding Season: Start of May (Wernham et al, 2002)

Corn Bunting have between 1 and 3 broods per season with an average clutch size of 4.28 eggs (Baillie et al, 2005).

Breeding performance has increased per nest attempt since 1975 (Brown and Grice, 2005).

Survival Rate: Adult: 0.58 (Baillie et al, 2005)

HABITAT INFORMATION

General Habitat:

Corn Bunting are associated with tilled farms, summer cereals and weedy stubbles in winter (Brown and Grice, 2005). They prefer open terrain with isolated trees and hedges for song posts that are vital for marking territories (Kirby et al, 2000). They avoid rocks and broken terrain, forests and wetlands (Snow and Perrins, 1998).

A study in 2005 showed that whilst there was no statistical preference for any one particular crop there was a strong preference for boundary features (Mason, 2005).

Breeding Habitat:

Corn Bunting require a high frequency of medium to tall crops for nesting with several crops at least 10-50 cm in height (Kirby et al, 2000).

The habitat needs to have an abundance of ground invertebrates for chick rearing (Kirby et al, 2000).

Non-Breeding Habitat:

Frequent patches of dense vegetation for roosting and open ground for feeding, approximately 75% open ground with reed beds or dense scrub cover (Kirby et al, 2000).

FEEDING AND BEHAVIOUR INFORMATION

Food Requirements:

Adults are granivorous and nestlings insectivorous (Brown and Grice, 2005). Adults require seed bearing plants such as *Triticum aestivum, Hordeum, Lolium, Polygonum* and *Rumex* species (Kirby et al, 2000).

Chicks feed on 10% ripening grain and 90% invertebrates (Ward and Aebischer, 1994).

Migratory Habits:

Corn Bunting tend to be sedentary birds (Brown and Grice, 2005) but are partial migrants in the northern most regions of their range. The British population is largely resident although little is truly known due to the scarcity of ringing data (Wernham et al, 2005). Records from deceased individuals indicated a mean dispersion of only 4 km although there is evidence of winter movements from coastal areas inland (Wernham et al, 2005).

CAUSES OF DECLINE

Breeding success is heavily influenced by the ability for chicks to find invertebrate food and where pesticides are used nest survival is significantly reduced (Brown and Grice, 2005).

Nest loss is one of the biggest causes of decline before 1970 nest loss rates stood at 7% afterwards this rose to 21% (Brown and Grice, 2005).

Reduced winter survival is a consequence of lower winter food availability from stubbles. More autumn sown crops and the tendencies for stock to be brought inside rather than fed outdoors means there are much less food available (Brown and Grice, 2005).

BENFECIAL MANAGEMENT

There has been a positive correlation shown between crop set aside and rotational grass and Corn Bunting density (Ward and Aebischer, 1994). There has also been a significant positive effect for most granivorous passerines in the West Midlands to the Pilot Arable Stewardship (Bradbury and Alen, 2003).

Nest Record Data from between 1990 and 1995 has shown a better breeding performance in pastoral areas and grazing/mixed farms (Siriwardena et al,

2000).

Beneficial management includes (Brown and Grice, 2005):

- Retaining weedy over winter stubbles
- Introduction of wild bird seed mixtures to set asides
- Grassland extensification
- Grass Margins and maintenance of linear features
- Spring/summer fallows.
- Low input spring cereals

COUNTY DISTRIBUTION / BASELINES

In the 1940's Warwickshire had a secure population of Corn Bunting. Between 1946 and 1950 however they were only present in Shipston and South Warwickshire (Lord and Munns, 1968). By 1947 the species was listed as very rare and declining (Norris, 1947).

Figure 8. Corn Bunting Population in Warwickshire.

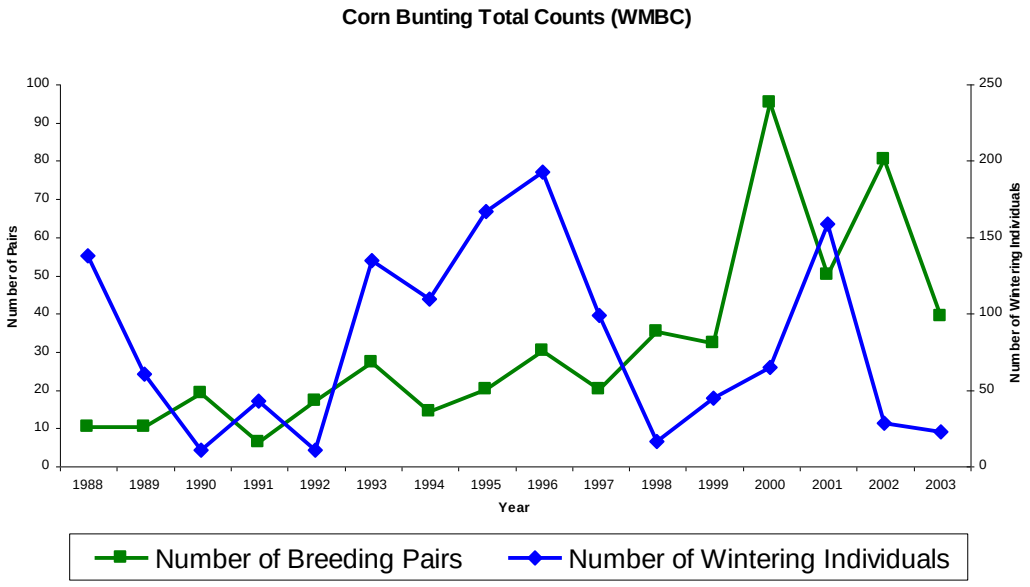
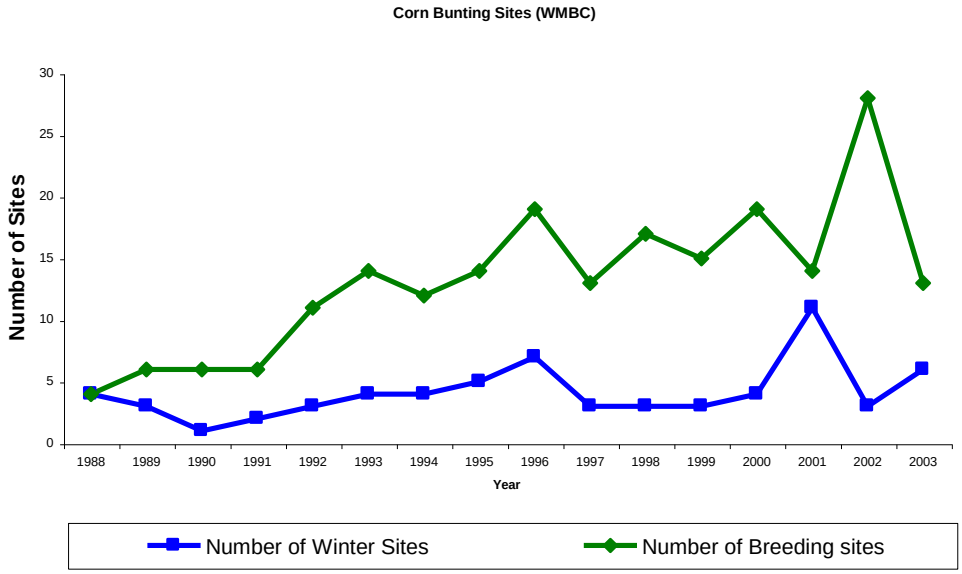


Figure 8 illustrates data collected from the WMBC Annual Reports. It indicates a steady increase in breeding pairs over the past 15 years. Wintering populations fluctuate more and are probably more a case of lack of sightings

rather than real declines indicating that breeding populations do not remain at natal sites but become more mobile.

Figure 9.Number of Sites Corn Bunting are found in Warwickshire.

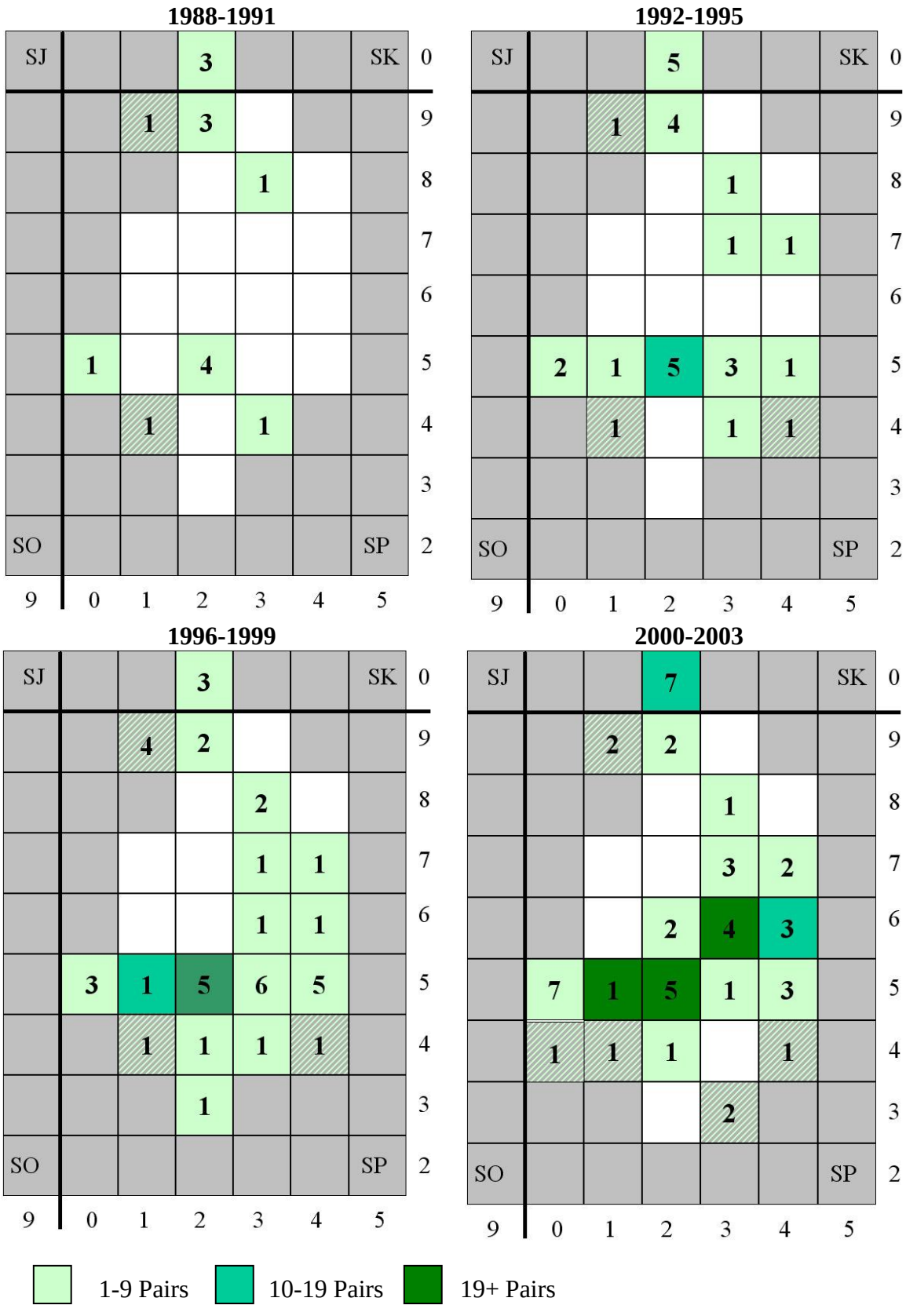


As with the total counts there is likewise an increase in the number of sites that Corn Bunting have been recorded in suggesting an increase in range (See Fig 9).

The distribution maps interestingly show a slightly different breeding distribution to other granivorous birds instead of exhibiting a preference for the southeast and far north of the county there is a strong core around Stratford and Leamington.

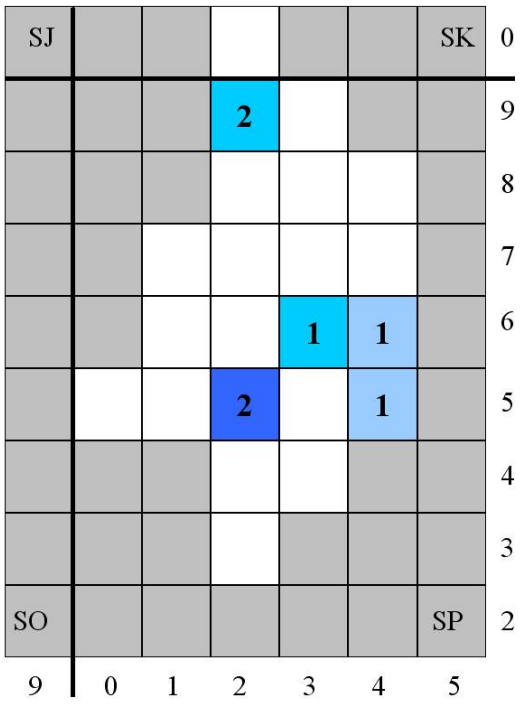
Figure 10. Breeding and Winter Distribution Maps

Breeding Maps – Numbers represent the number of sites where Corn Bunting were recorded

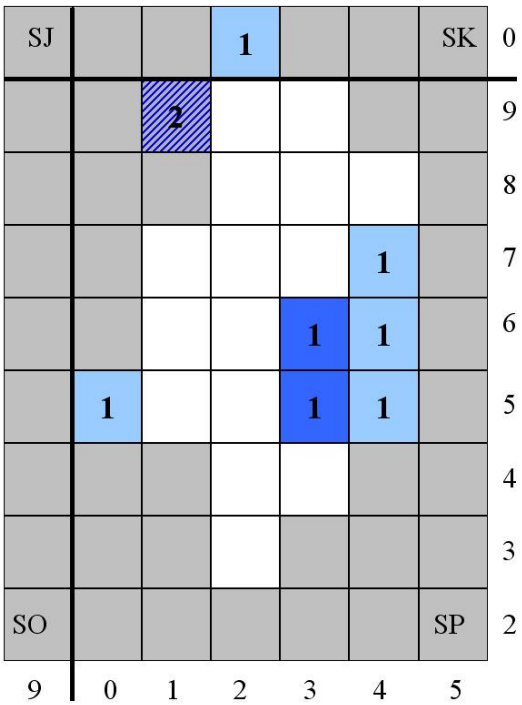


Winter Maps – numbers represent the number of sites Corn Bunting were recorded in.

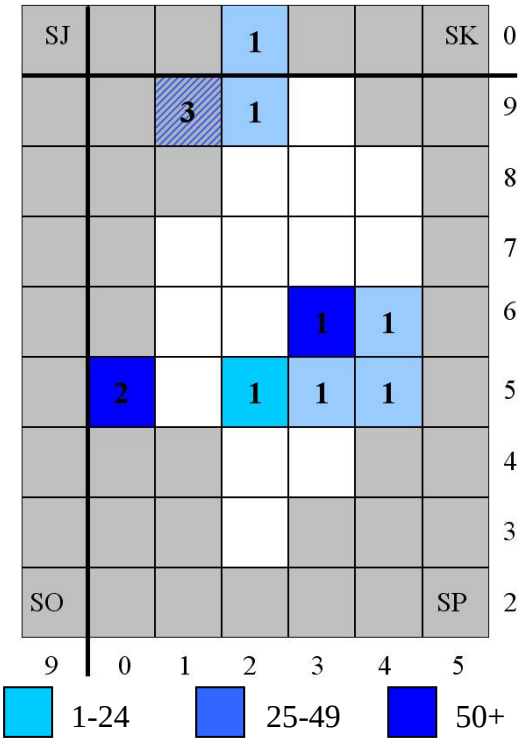
1988-1991



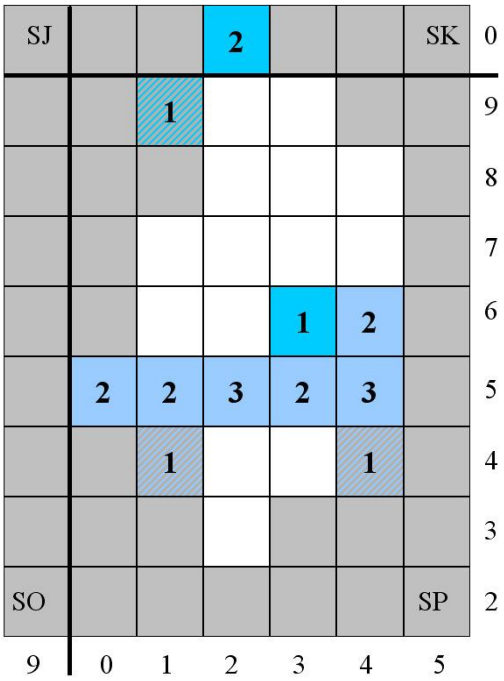
1992-1995



1996-1999



2000-2003

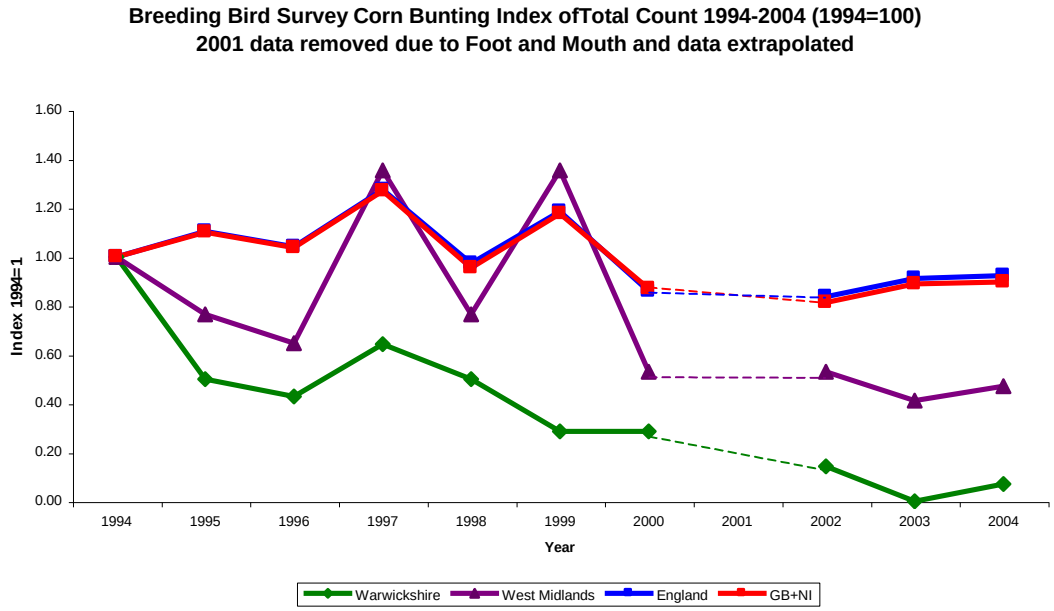


1-24 25-49 50+

Breeding Bird Survey

Evidence from breeding bird analysis (Fig 11) illustrates a gradual long-term national decline between 1994 and 2000. From 2000 this seems to have evened out and remained stable.

Figure 11. Corn Bunting populations according to BTO Breeding Bird Survey



MONITORING

There are no specific guidelines on the monitoring or surveying of Corn Bunting. Generic farmland bird surveys and the Breeding Bird Survey approach are most commonly used. Corn Bunting are best assessed with the other Farmland passerines (Skylark and Tree Sparrow), this addressed in a separate section at the end of the species accounts.

GREY PARTRIDGE (*Perdix perdix)*

STATUS INFORMATION

Status:

A/C – Species recorded naturally since 1950 but introduced by man and now self sustaining. (Brown and Grice, 2005).

Regional Status:

In 1947 the Grey Partridge was listed as having a wide county distribution in Warwickshire and being fairly common with average covey sizes ranging from 6 to 20 individuals. (Norris, 1947). In the West Midlands it is listed as being a fairly common but rapidly declining resident (Harrison and Harrison, 2005)

Index of Abundance:

8 - Abundant

Population Estimates: 70,000-75,000 pairs 2000 best estimate (Baker et al, 2006).

The Common Birds Census predicted an effective breeding population in England of 132,000 individuals (Brown and Grice, 2005) whilst surveys conducted between 1988 and 1992 set the whole United Kingdom population at around 140,000-150,000 individuals (Snow and Perrins, 1998). The Common Birds Census between 1968/80 and 1999/00 showed a sharp decrease in population size (Henderson et al, 2004). This downward trend continued to be illustrated in the Breeding Bird Survey that demonstrated a 39% fall in numbers between 1994 and 2003 (Baillies et al, 2005)

National Distribution:

Present in 80% of 10km squares in England 1988-91 (Brown and Grice, 2005).

SPEC Category:

3 – Whose population whilst not concentrated within Europe have unfavourable conservation status.

EU Threat Category

V - Vulnerable

UK Conservation List:

Red – High Conservation Concern >50% decline.

Legal Protection:

EU Birds Directive Schedule II/I and III/I

SPECIES INFORMATION

Social Organisation: Gregarious

Age at First Breeding: 1 Year (Wernham et al, 2002)

Breeding Season: End of April/May

Grey Partridge are gregarious birds forming flocks for between 7 and 8 months of the year between July and February in covies ranging in size from 5-15 (Snow and Perrins, 1998). Grey Partridges establish monogamous pair bonds and maintain over lapping territories (Snow and Perrins, 1998). Pairs are formed by the end of February (The Game Conservancy Trust, 2001). Inter-specific competition during the breeding season can become so intense that many pairs are forced into breeding in sub-optimal habitats (Panek, 1999) The Grey Partridge has a wide brood potential with 25-80% of pairs producing broods each year (Panek, 1999). There is one brood per year with a clutch size ranging from 13-16 eggs (Baillie et al, 2005).

Nesting occurs in the ground in thick vegetation (Snow and Perrins, 1998). Nests tend to be on sheltered free-draining soils with a southern aspect (The Game Conservancy Trust, 2001).

Survival Rate: 0.55 The lifespan of the typical Grey Partridge is 3 years. (Baillie et al 2005)

HABITAT INFORMATION

General Habitat:

Farmland and woodland. The Grey Partridge shows a preference for seed bearing plants with coverage of 25% or more of Gramineae, Trifolium, Polygonum, Stellaria and Poa species (Kirby et al, 2000).

In studies examining the use of different farming techniques it was illustrated

that the partridge had a preference for fallow fields in set-aside (Buckingham et al, 1999).

Breeding Habitat:

During breeding the Grey Partridge selects territories with areas of cover. They are ground nesters and require habitats such as young plantations, long grass or crops (Snow and Perrins, 1998). Evidence shows a strong preference for nesting in linear cover such as hedgerows (Brown and Grice, 2005 and Panek, 1999), where it's been found that brood production increased in relation to length (Panek, 1999).

The breeding territory of the Grey Partridge needs to have a large abundance of chick food such as ground dwelling invertebrates. Sawflies, caterpillars, weevils, aphids and crane flies are all selected for and their abundance can be increased with raised grassy banks >0.5m high (beetle banks) (Kirby et al, 2000).

FEEDING AND BEHAVIOUR INFORMATION

Food Requirements:

Adult Grey Partridges feed on the green leaves of grasses, cereals and clovers. Seeds from grains and bistorts form a substantial part of the diet. Insects are essential for chick survival being the sole food source (Snow and Perrins, 1998).

Migratory Habits:

Grey Partridges are essentially sedentary with a home range of less than 1km^2. Individual movements are usually 500m and rarely longer than 3km. When the eggs hatch and chicks are taken to invertebrate rich cover (Brown and Grice, 2005).

CAUSES OF DECLINE

The increased use of pesticides to reduce invertebrate numbers in arable fields severely reduced chick survival rates this combined with the removal of hedges to increase field size drastically affected population growth both restricting breeding territory and survival (Brown and Grice, 2005).

The reduction in the number of gamekeepers throughout the country led to an

increase in the number of predators such as Fox, Crow and Magpie, these all heavily predated the nests (Brown and Grice, 2005; Panek, 1999).

BENFECIAL MANAGEMENT

- Low input spring cereals to provide year long adult food and cover for breeding (Brown and Grice, 2005).
- Conservation headlands, grass margins, beetle banks and hedge restoration to provide additional breeding cover and chick foraging (Brown and Grice, 2005).
- Control of predators in the area to increase nest survival (Panek, 1999).
- The Game Conservancy Trust suggests that a sustainable autumn population for shooting is 30% (Game Conservancy Trust, 2001).

COUNTY DISTRIBUTION / BASELINES

Analysis of the WMBC Annual bird reports has revealed a change in the distribution of Grey Partridge in the county. Overleaf 4 maps illustrate the changes over the 15 years examined. They show an increase in the range of wintering covies but the retraction of breeding sites. Where as in the late 1980's and early 1990's breeding was more spread across the county by 2000 this distribution was restricted to the farmland and woods of Southern and South Eastern Warwickshire or the very Northern most tip.

Figure 13 is compiled using data collated from WMBC Annual reports it illustrates variable nature of the Grey Partridges distribution and population within the county, this maybe more a reflection however on recording than actual numbers.

Figure 12 Maps showing the distribution of Grey Partridge in Warwickshire.

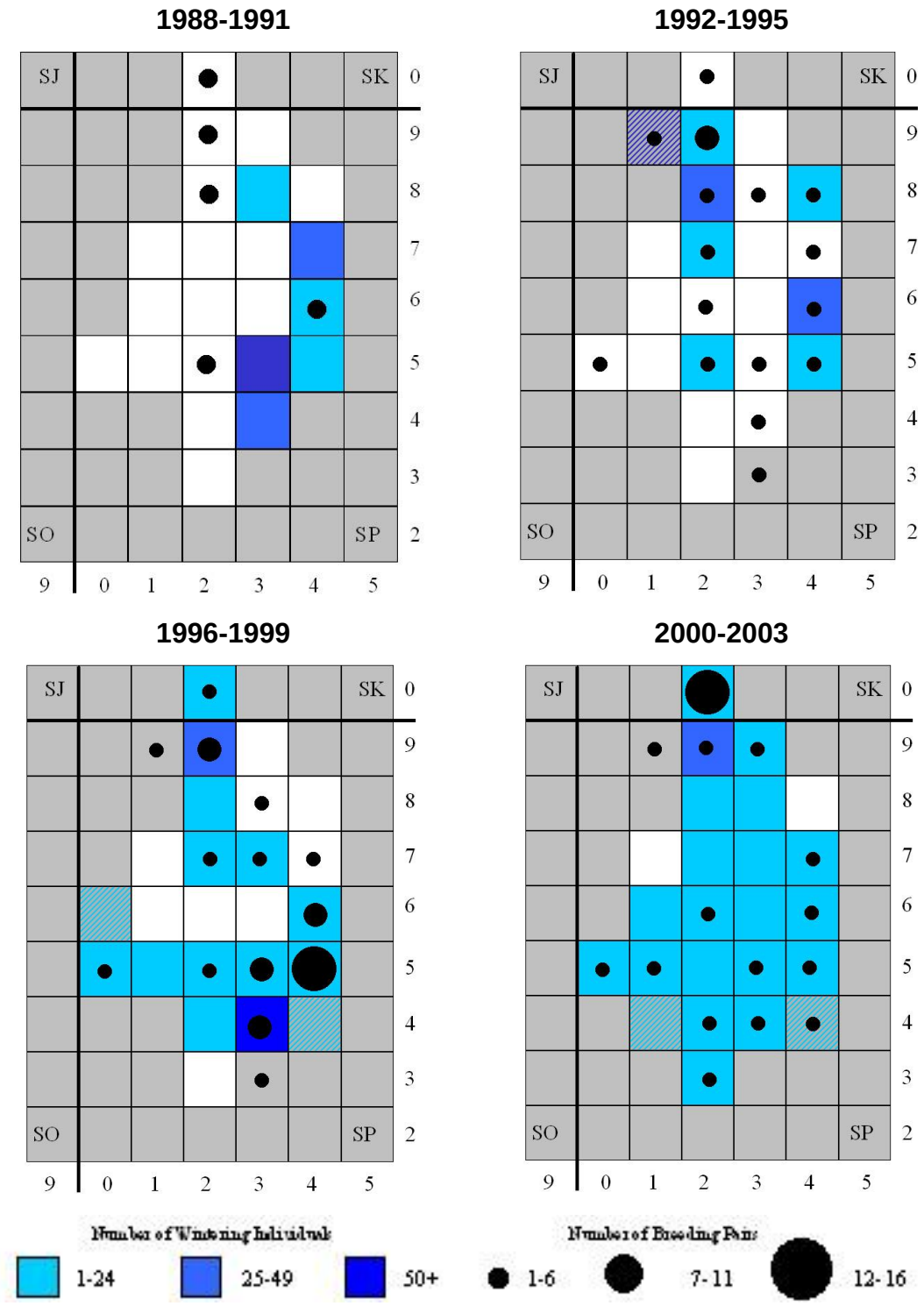
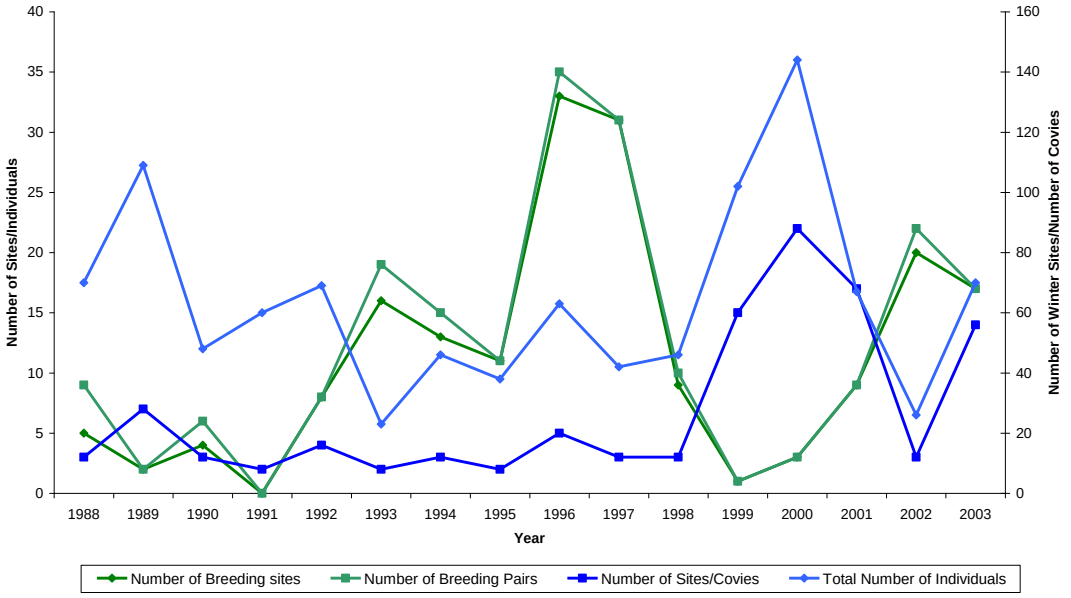


Figure 13 Total Counts and Number of Sites with Grey Partridge records in Warwickshire.



Over the past 15 years there has been a general increase in the number of pairs of Grey Partridge being reported each season. Breeding rates seem to have increased up until the mid-1990's before dramatically crashing at the turn of the millennium with some recovery in numbers in the past 3 years.

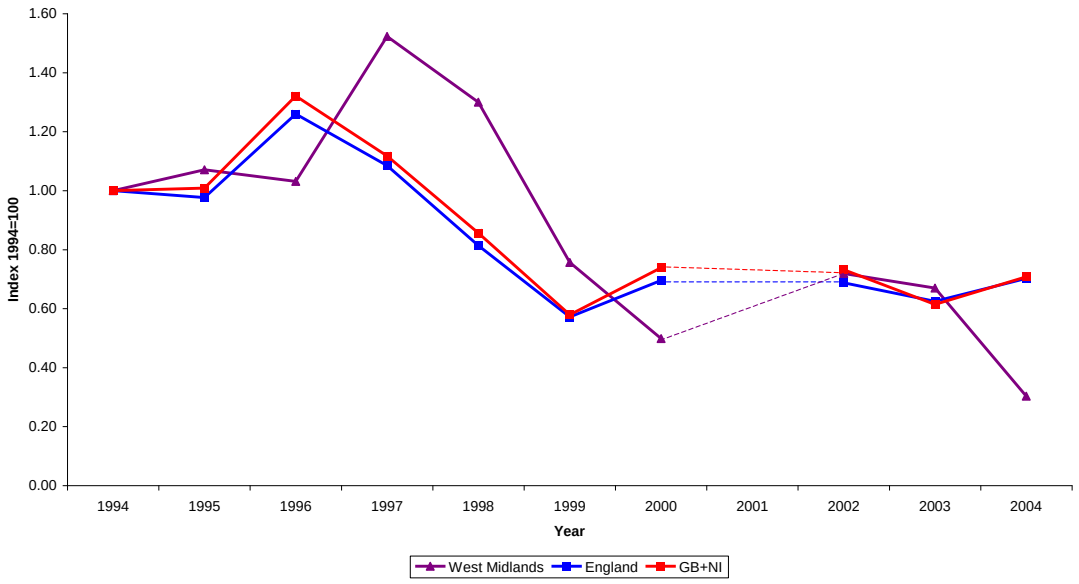
For Covey size and wintering sites the Grey Partridge again exhibits fluctuation with an initial increase in 1989 and a more pronounced peak in 2000 coinciding with the trough in the number of breeding pairs (See figure 13). This could indicate a better but under recorded breeding season in 1999 and 2000 with new individuals being picked up in the winter counts. Winter numbers dropped to their lowest point in 2002.

Breeding Bird Survey

Figures collected during the Breeding Bird Survey mirror what was revealed in the WMBC Annual reports lending them a level of credibility rather than the fear of a misrepresentative sample of under recording. Figure 14 shows that in all areas after an initial increase in numbers in the mid-1990's the population began to fall steadily with only a minor arrest between 200and

2002. Regionally the Grey Partridge faired better than the national picture suggested up until 2003, where upon number plummeted in the 2004 season.

Figure 14 Grey Partridge populations according to BTO Breeding Bird Survey



Baseline and Key Sites

In Warwickshire there are a number of sites that show consistent breeding success or large numbers of covies. These sites represent a nexus upon which to consolidate species recovery. They help to highlight areas where habitat and land management is successful and places where extension of these practices may help increase population numbers and in time allow a widening distribution. Key sites in Warwickshire seem to be Alvecote, Birchmoor and Priors Marston. These sites either have regular breeding pairs or a strong covey size.

MONITORING

National Monitoring of the Grey Partridge is covered by the Breeding Bird Survey and its precursor, the Common Birds Census (Gilbert et al, 1998). Being a game bird the Game Conservancy Trust conduct regular surveys and use a technique developed by Potts. This survey termed the 'March' Count has been organised by the GCT for 65 years. The survey comprises of a

single visit in mid-march during the 2 hours before dawn and/or the 2 hours before sunset. The target area is mapped and all habitats with the exception of woodland older than 5 years are visited. Pairs are recorded on a base map.

If productivity data is sought then a later survey is required, termed the 'August Brood Count'. Again the GCT runs this survey. This survey works in a similar fashion to the 'March Count'. A study area is selected and a map produced. The surveyor makes a single visit between the end of July and mid-September, as soon as possible to the harvest. The recorder notes all individuals' sexes and the number of young in each covey seen.

A Grey Partridge survey in Warwickshire could be combined with a Farmland Bird Survey (See Section 3) or it could be achieved by calling on the membership of the GCT locally to assist in a special one of county survey to establish a baseline that could be checked every 5 years.

LAPWING (*Vanellus vanellus)*

STATUS INFORMATION

Status:

A – Species recorded naturally since 1950 (Brown and Grice, 2005).

Regional Status:

Common migrant and winter visitor. Fairly common-common breeding species (Harrison and Harrison, 2005)

Index of Abundance:

8 – Abundant (Brown and Grice, 2005)

Population Estimates: 154,000 breeding pairs and 1.5-2 million wintering individuals (Best Estimate 1985-1999) (Baker et al, 2006).

The Winter Atlas of 1988-91 suggested that there were 2.5 million individuals in Britain and Ireland (Brown and Grice, 2005). In the late 1980's between 185,000 and 238,000 pairs were estimated in the UK (Snow and Perrins, 1998). At a similar date (1987) a national survey found Lapwing on 24% of land surveyed. A resurvey in 1998 highlighted that losses in the West Midlands were more profound. Numbers in the West Midlands fell by 57% a significantly greater fall than the national reduction of 49%) (Brown and Grice, 2005).

Others studies confirmed the decline. Between 1968/72 and 1988/91 there was a 9% fall in the number of 10km squares occupied indicating a possible reduction in range (Brown and Grice, 2005).

National Distribution:

Present in 89% of 10km squares 1988-1991 (Brown and Grice, 2005)

SPEC Category:

2 – Species whose populations are concentrated within Europe and which have unfavourable conservation status.

EU Threat Category

Vulnerable

UK Conservation List:

Amber list – Medium conservation concern 25-50% population decline >20% of EU wintering population.

Legal Protection:

EU Birds Directive Schedule II/2 and Wildlife and Countryside Act 1981 Schedule E.

SPECIES INFORMATION

Social Organisation: Colonial (Wernham et al, 2002)

Age at First Breeding: 2 years (Wernham et al, 2002)

Breeding Season: Starts beginning of April and lasts 16 weeks (Wernham et al, 2002).

Lapwings breed in the open and are territorial throughout the breeding season (Snow and Perrins, 1998). Nesting is on bare or sparsely vegetated ground especially adjacent to pasture (Brown and Grice, 2005). The first egg will be laid in week 12 (Wernham et al, 2002). There is 1 brood per season with a mean clutch size of 4 eggs (Baillies, 2005).

It is predicted 11% of the total European population (137-174,000 pairs) breed in Britain (Baillies, 2005).

Survival Rate: Adult: 0.752

Juvenile: 0.595 (Baillies et al, 2005)

HABITAT INFORMATION

General Habitat:

Lapwing inhabit lowland farms, wetlands, estuaries, uplands and moors with an altitudinal range below 500m (Brown and Grice, 2005; Snow and Perrins, 1998). Lapwing show a strong association with farmland. 95% of birds preferred spring tilled arable land and rough grazing. They avoid autumn sown crops and temporary grasslands (Brown and Grice, 2005).

Open large fields are favoured for roosting with unrestricted views over 500m and an effective field size of 16ha with vegetation less than 10cm in height

and short scrub approximately 15 cm in height for feeding (Kirby et al, 2000). 74% higher densities have been recorded on mixed farms (Brown and Grice, 2005).

Breeding Habitat:

Lapwings breed in areas with open views. Survival is better in fields with low stocking densities (Bovine: <1.25 per ha, Ovine: <7.51 per ha) (Kirby et al, 2000).

They will nest near pools, ditches or channels with shallow gradients to allow chicks access. Optimum conditions are believed to be an area of 75% water with shallow slopes along 30% of the perimeter. Wet fields with surface pools for feeding are also viable when between 20-30% of the land area is flooded or wet. (Kirby et al, 2000).

Non-Breeding Habitat:

Lapwing frequent shallow flooded areas or irregular shapes with a depth of 10cm over 30-50% of the area (Kirby et al, 2000).

FEEDING AND BEHAVIOUR INFORMATION

Food Requirements:

Lapwing are diurnal feeders (Snow and Perrins, 1998) and feed on earthworms and leatherjackets (Kirby et al, 2000).

Migratory Habits:

Britain is the northern edge of the Lapwings wintering range. Lapwings disperse to breeding areas in late May and early June (Snow and Perrins, 1998). Many Lapwing winter in England but some also winter in Scandinavia, Germany and the Netherlands (Brown and Grice, 2005). Lapwing winter arrivals occur in autumn and number approximately 1 million individuals often centred upon traditional wintering sites (Wernham et al, 2002).

Those Lapwing that breed in Britain are only partial migrants, some winter close to breeding grounds, others can make substantial movements onto the continent (Wernham et al, 2002).

CAUSES OF DECLINE

In 2002, the most up to date data, in the West Midlands Lapwing density was

1.42 pairs per Km^2 down 38.5% from 1982 and was a greater fall than the national average of 36.8% (Wilson et al, 2005). The CBC between 1968/80 and 1999/00 detected no change in upland populations despite a total decline of 37% between 1969 and 1999 (Henderson et al, 2004). This suggests a stable upland breeding population but an unstable lowland one. This was reinforced when a 2002 survey of wet grasslands showed a 38% reduction in breeding pairs over a 20-year period (Brown and Grice, 2005).

Lapwings are very dependent on an agricultural land use particularly in regard to livestock and cereal production (Taylor and Grant, 2004). Reduced Lapwing productivity can be linked to an increase in the intensification of cultivation; the replacement of spring sown crops with autumn ones; the loss of mixed farming and the separation of nesting areas from feeding areas (Brown and Grice, 2005; Taylor and Grant, 2004).

Lapwing being ground nesters are particularly vulnerable to predators such as Foxes, Crows and Magpies (Brown and Grice, 2005). Studies of upland birds showed a direct relation between falling numbers and land use and crow predation (Fuller et al, 2002) whilst others have linked high Fox populations to declines (Taylor and Grant, 2004).

Farm management is also important; crop spraying and rolling not only reduces insect food for chicks but risks nest destruction if conducted in the breeding season (Brown and Grice, 2005).

BENFECIAL MANAGEMENT

Lapwings are known to re-colonise areas easily which provides some hope for re-establishing this species in the county.

Research has shown that although nationally Arable Stewardship schemes helped improve national numbers there was no significant effect on Lapwing in the West Midlands (Fuller et al, 2002).

English Nature has developed guidance notes for landowner's which instruct them on how to best cultivate their land to support Lapwing this advice states that neutral grassland with a predominantly short sward and open, damp ground was found to be ideal. It is suggested that 80% of a fields should have 20% clumps and 70% short sward less than 5cm in height with up to 20%

bare grounds to maximise Lapwing survival (English Nature, 2002a).

The key to protecting Lapwing lies in 3 methods:

1. Managed Nature Reserves
2. Effective Agri-environmental schemes
3. Farm management. (English Nature, 2002a).

COUNTY DISTRIBUTION AND BASELINES

Lapwing distribution as shown in Figures 15 and 16 shows that there is a general trend for an increase in distribution since 1988. The Lapwing in between 1966 and 1968 was quite widespread, being found in most 10km squares. Within 20 years this was severely reduced to a handful of squares mainly in the north of the county.

Winter Distribution (Fig 16) shows a decline in numbers despite a broadening of sites this could suggest that Lapwings do not winter in the county as much as they used to.

Results from the WMBC Bird Report analyses show a decline in breeding records and sites between 1965 and 1995. This trend was slowed from 1996 with both an increase in range and number of pairs in core areas in the North and south east of the county.

Figure 17 shows that the number of breeding pairs in Warwickshire has increased over the past 15 years with the largest gains being in 2002. This increases whilst promising still only puts the number pairs of Lapwing at between 19 and 35. In line with the increase in the number of pairs the number of sites they have been recorded in has also increased. This suggests that key sites within the county are becoming more suitable for breeding but that breeding densities are remaining small.

Winter records show an increase in distribution over time but an overall reduction in flock sizes (Fig. 18).

Figure 15.Lapwing Breeding Distribution

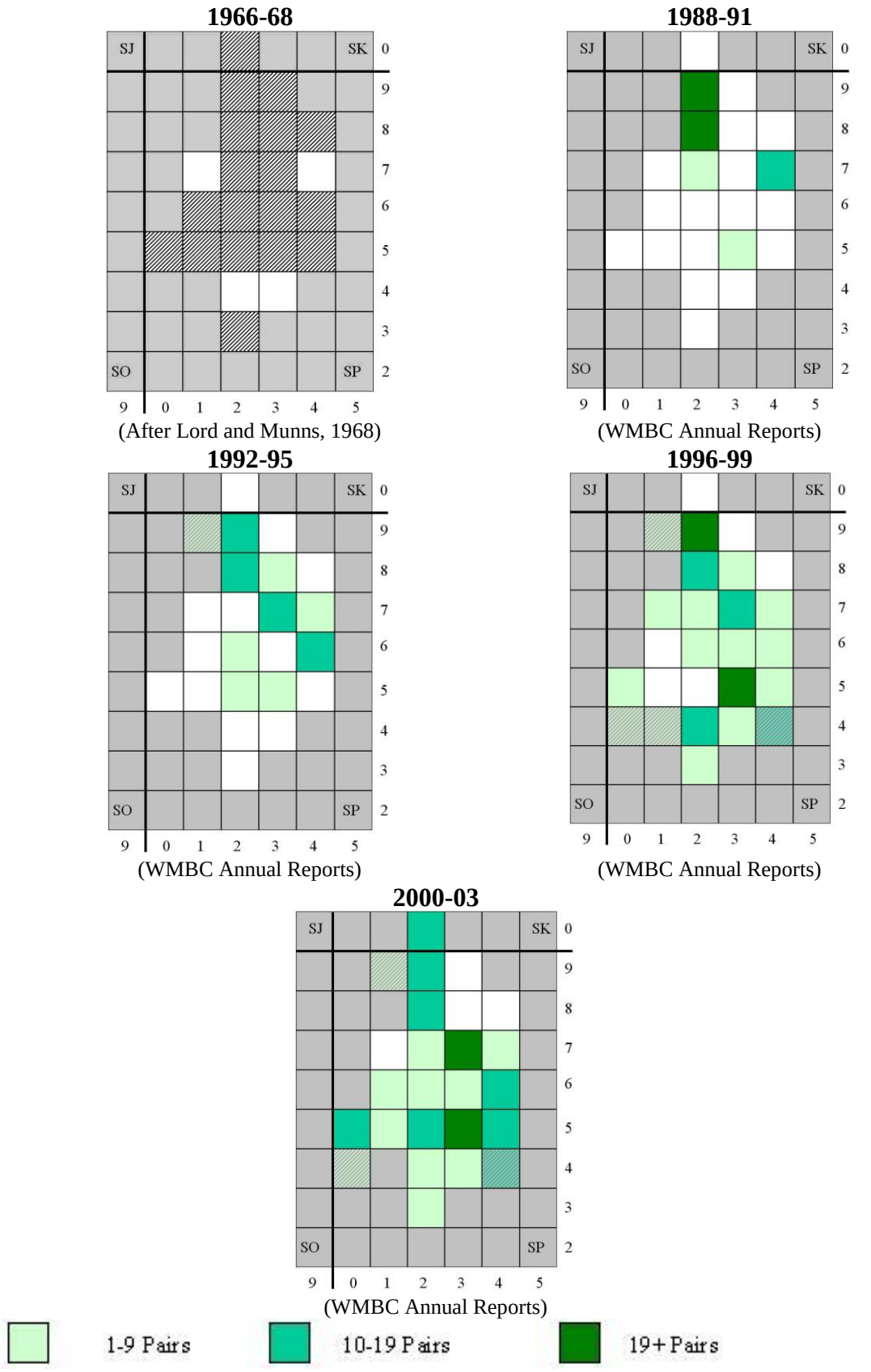


Figure 16. Lapwing Winter Distribution

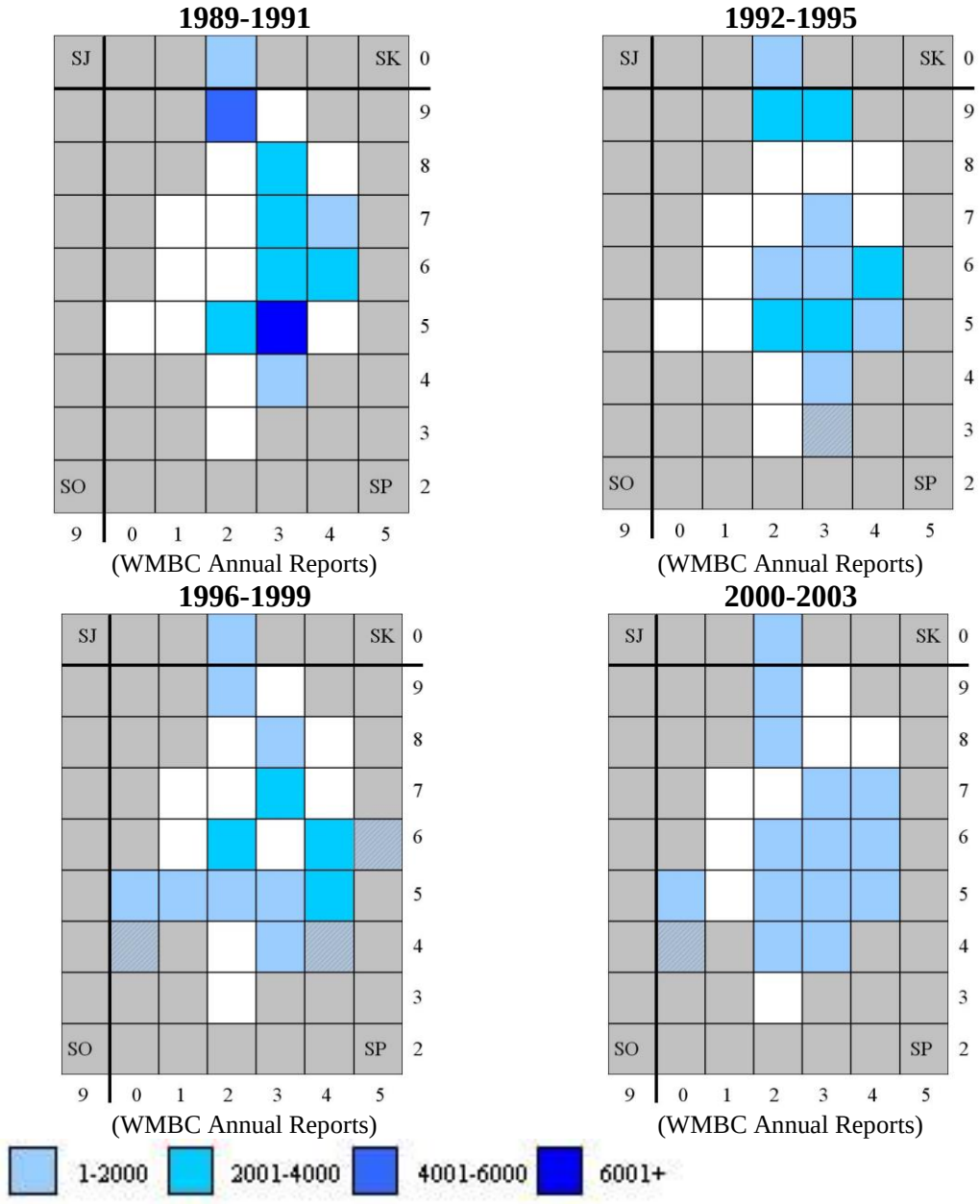


Figure 17 Total Count and Sites where Breeding Lapwing are present in Warwickshire (WMBC)

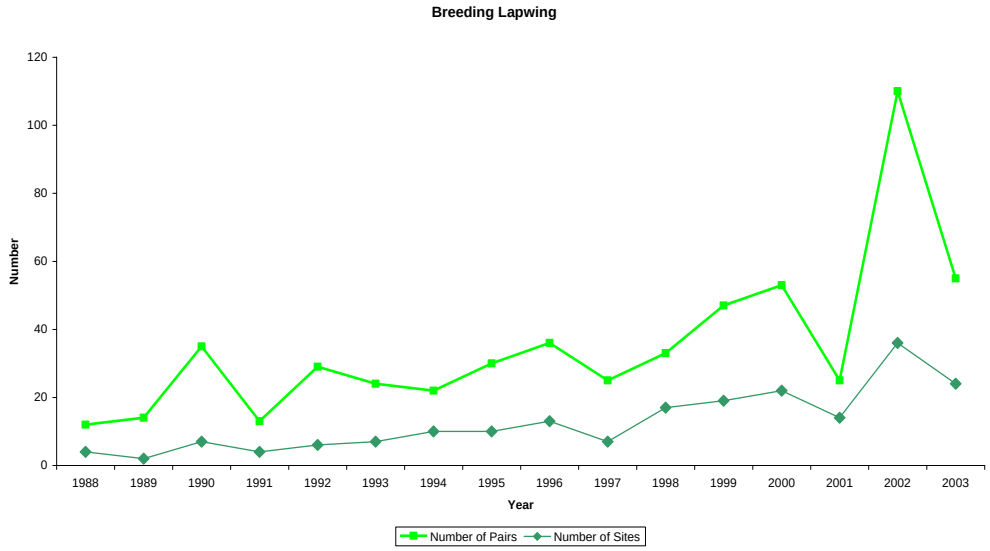
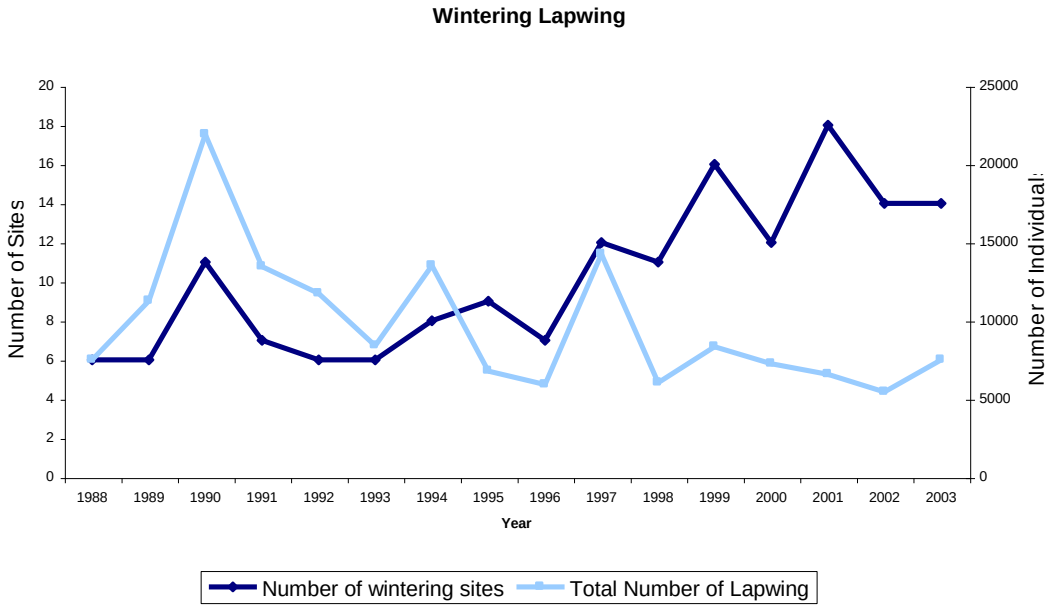


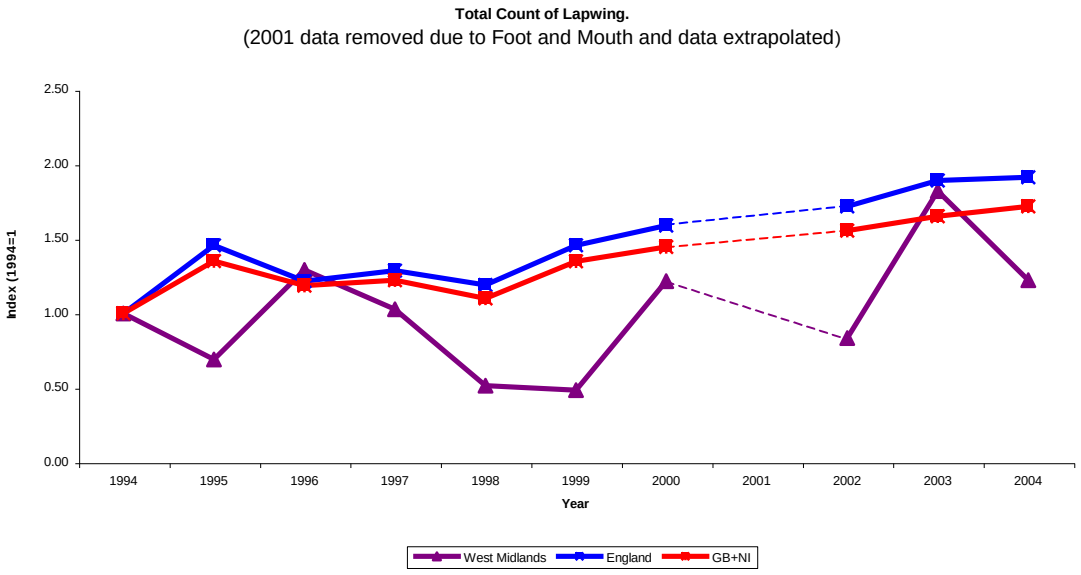
Figure18. Flock sizes and sites where Lapwing Winter in Warwickshire (WMBC)



Breeding Bird Survey

The BBS (Fig. 19) shows a general increase in Lapwing numbers nationally between 1994 and 2004. Regionally the picture is less promising. Numbers fluctuated between 1994 and 2000 with a more significant increase in 2003. This tends to suggest that Lapwing populations are less stable in this area than nationally and probably relates directly to changing land use patterns in the area from 1994.

Figure 19. Breeding Bird Survey Analysis of Lapwing Numbers



Wetland Breeding Bird Survey

In contradiction to the BBS results total WeBS counts for the sites listed in the county illustrate a net decline in numbers between 2000 and 2003 (Fig.20 and 21). This is borne out in the site-by-site analysis. Numbers in the Tame Valley plummeted in this time period as they did at Brandon. Draycote was the only WeBS site to see consistent increases.

Figure 20 WeBS Data for Lapwing Numbers between 2000 and 2003

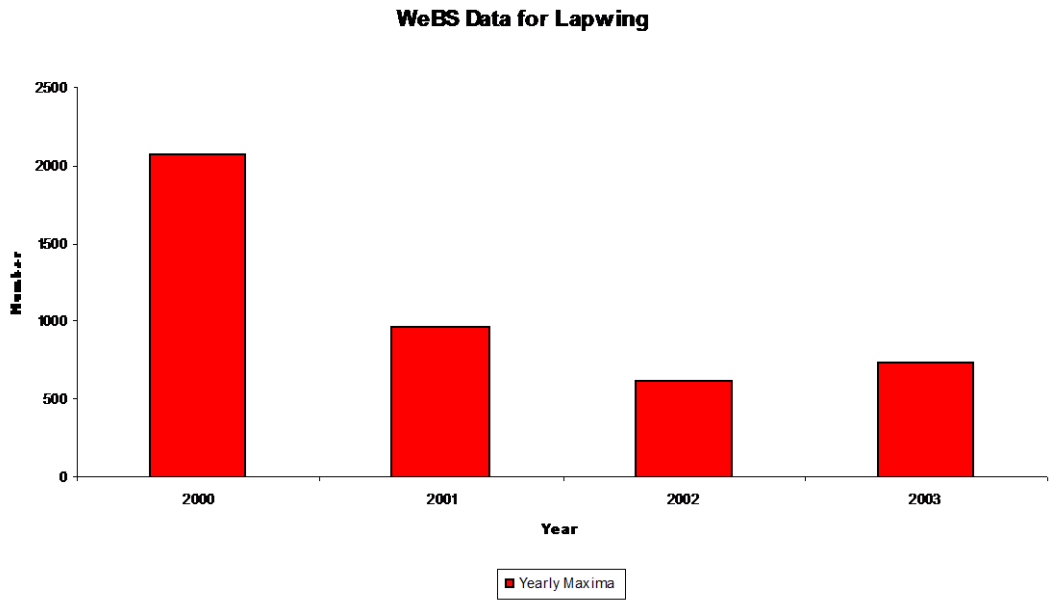
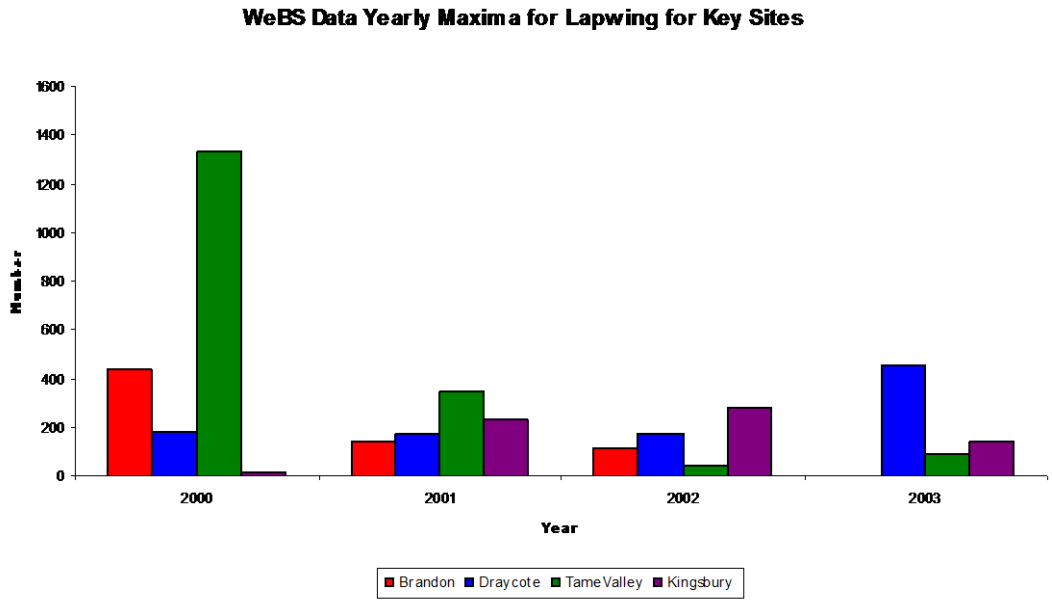


Figure 21 WeBS maxima counts at Key Sites in the County (2000-03)



MONITORING

Lapwing were the subject of a specific national survey in 1998. The survey was a follow up to an earlier 1987 survey and was co-ordinated by the BTO (Gilbert et al, 1998). The survey was a breeding season survey and involved a single visit in April to a mixture of habitats and the numbers of pairs

encountered were recorded on a base map. This approach could be easily replicated in Warwickshire given enough volunteers.

For winter counts the generic technique is that used by the WeBS, this survey concentrates on established wintering sites and is based on flock counts on a monthly basis. Current WeBS figures from the key sites already provide an adequate baseline and their future coverage is likely to continue. This means that the data collected from WeBS, which is readily available from the BTO, forms a ready to go monitoring programme for wintering Lapwing.

SKYLARK (*Alauda arvensis)*

STATUS INFORMATION

Status:

A – Species recorded naturally since 1950 (Brown and Grice, 2005).

Regional Status:

Very Common, though much declined, resident, passage migrant and winter visitor (Harrison and Harrison, 2005).

Index of Abundance: 9 – Extremely Abundant

Population Estimates: 1.7 million territories in 2000 (Best estimate) (Baker et al, 2006)

This value represents 5% of the European population (Brown and Grice, 2005).

In 1997 there were an estimated 800,500-1,002,650 pairs (Browne et al, 2000). The 1988-91 BTO Atlas predicted 2 million territories (Snow and Perrins, 1998). Analysis of Common Birds Census plots between 1968/80 and 1999/00 showed a fall of 85% (Henderson et al, 2004) whilst upland densities have increased between 1969 and 1989 (Siriwardena et al, 2000).

National Distribution:

Found in 100% of 10km squares between 1988 and 1991 (Brown and Grice, 2005).

SPEC Category:

3 – whose populations whilst not concentrated within Europe have unfavourable conservation status. (Brown and Grice, 2005).

EU Threat Category

V - Vulnerable

UK Conservation List:

Red – High Conservation Concern. >50% population decline (Baillies et al,

2005).

Legal Protection:

EU Birds Directive Schedule II/2

SPECIES INFORMATION

Social Organisation: Territorial. Forms flocks in Winter.

Age at First Breeding: 1 year (Baillies et al, 2005)

Breeding Season: Begins mid April (Wernham et al, 2002)

Skylarks nest on the ground. They lay 1-4 broods per season with an average clutch size of 3.49 eggs (Baillies et al, 2005).

The breeding density of Skylarks can vary from 5 to 70 pairs per square kilometre. It is usual for 2-3 nesting attempts to be made each season to currently sustain the population (Brown and Grice, 2005).

Breeding Dispersal: 0.7 km (Wernham et al, 2002)

Natal Dispersal: 5.5 km (Wernham et al, 2002)

Survival Rate: Adult: 0.67 (Baillies et al, 2005)

HABITAT INFORMATION

General Habitat:

Skylarks have a strong association with arable crops (Browne et al, 2000). They can be found in grassland and upland areas. They show a preference for set aside, dry semi-natural woodlands, moor land, legumes, spring cereals and improved ungrazed pasture (Snow and Perrins, 1994).

Skylarks select areas with lots of seed plant for feeding such as: *Triticum aestivum*, *Stellaria media*, *Sinapsis arvens*, *Sonchus* and *Compositae* species (Kirby et al, 2000).

Breeding Habitat:

During the breeding season Skylarks establish territories in areas that have high numbers of flies, beetles and aphids upon which juvenile birds are fed. The largest threat to nests is from trampling and so stocking densities need to be less than 1.25/ha for cows and less than 7.5/ha for sheep. The vegetation needs to be less than 30cm in height over at least 90% of the area (Kirby et al, 2000).

Non-Breeding Habitat:

Outside of the breeding season Skylarks continue to prefer open fields with unrestricted views over 150m (Kirby et al, 2000).

FEEDING AND BEHAVIOUR INFORMATION

Food Requirements:

Year round seed bearing plants are of particular importance but during breeding and chick rearing an abundance of flies, beetles and aphids are required (Kirby et al, 2000).

Migratory Habits:

Skylarks do exhibit seasonal movements often forming flocks in winter, however the British population is more sedentary than European ones (Brown and Grice, 2005).

CAUSES OF DECLINE

The intensification of grassland management through activities such as over stocking and increased nitrogen inputs have resulted in a loss of nesting and foraging habitats (Brown and Grice, 2005). A reduction in the sowing of arable crops in spring and a reduction of mixed farming has severely limited the suitability of farmland for breeding. Breeding is further restricted by an increase in nest destruction and chick mortality as a result of over stocking, rolling and harrowing (Brown and Grice, 2005).

Skylarks need to make 2-3 nest attempts per season to sustain the population (Brown and Grice, 2005) but late winter and autumn sown cereals have reduced the opportunity for late season nesting (Siriwardena et al, 2000).

BENFECIAL MANAGEMENT

Skylarks, as ground nesting birds, benefit from low stocking densities; spring and summer fallows. Low input spring cereals provide good cover for nesting and excellent foraging territory (Brown and Grice, 2005).

COUNTY DISTRIBUTION / BASELINES

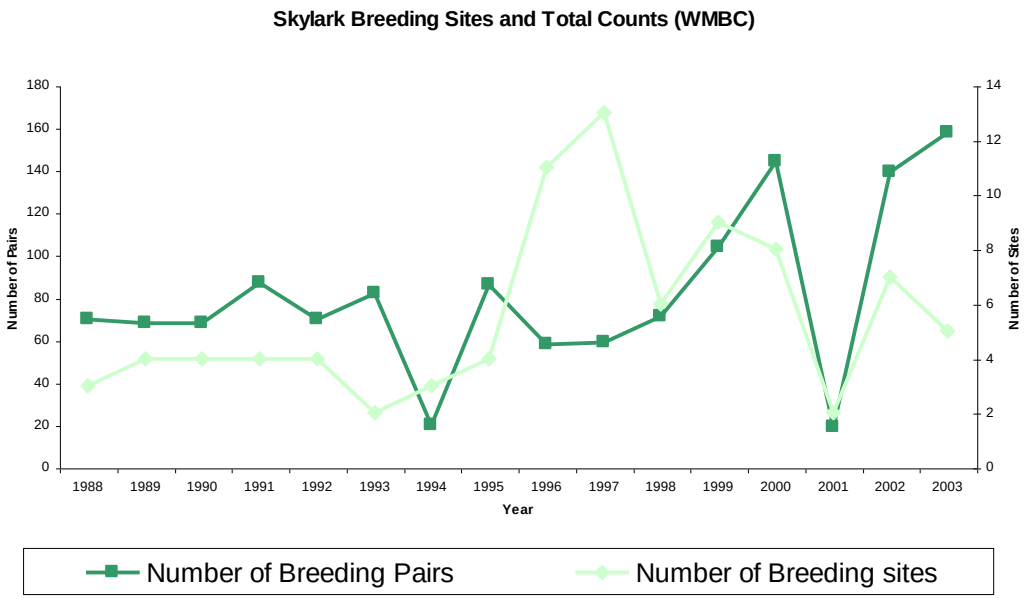
The Skylark is the ubiquitous farmland bird that most people know. They are found throughout the county and in some places quite close to urban areas. In

Warwick there are breeding pairs on the Common and unfortunately good numbers on open land to the south-west of the town, which is under development.

On the whole there seems to have been a general increase in the number of breeding pairs recorded in Warwickshire in the last 15 years (Fig. 22). Since 1988 numbers have approximately doubled despite severe drops in population in 1994 and 2001 (although the 2001 can be put down to less fieldwork due to foot and mouth). The number of sites where these pairs were recorded has decreased despite the population increase, this could be an indication of fieldwork or recording discrepancies or an indication that fewer sites are suitable and those that are have higher productivity values (Fig.22).

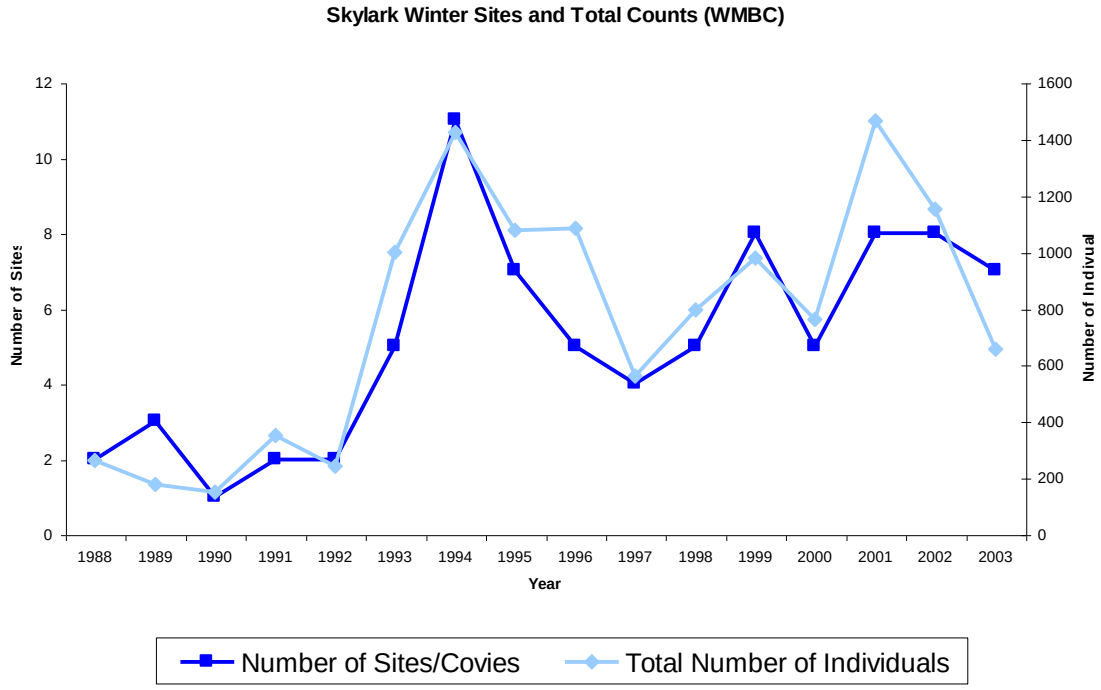
The Skylarks winter distribution and population figures have both broadly increased in the 15-year study period (Fig.23). The trend for both the number of sites and the size of flocks follow the same broad pattern with only a major divergence in 2001 in which flock size was larger in proportion to the number of sites.

Figure 22. Number of sites and breeding pairs of Skylark (WMBC).



The distribution of Skylarks in Warwickshire can be seen in Figure 25. It illustrates that in the period of 1966 to 1968 that it was a prolific breeder breeding in 18 10km squares. This range was severely reduced by 1988. By 2000 Skylarks were breeding in 12 10km squares. This recovery was concentrated in the extremes of the county, the far north and the south-east.

Figure 23. Number of Sites and Winter Flock sizes of Skylark (WMBC)



Breeding Bird Survey

Analysis of the Breeding Bird Survey data at the regional and national level reveals very little divergence (Fig.24). It backs up the evidence from the WMBC bird reports that the population is on the increase though it is still far from the levels it once was.

Figure 24. BBS Analysis of Skylark Populations

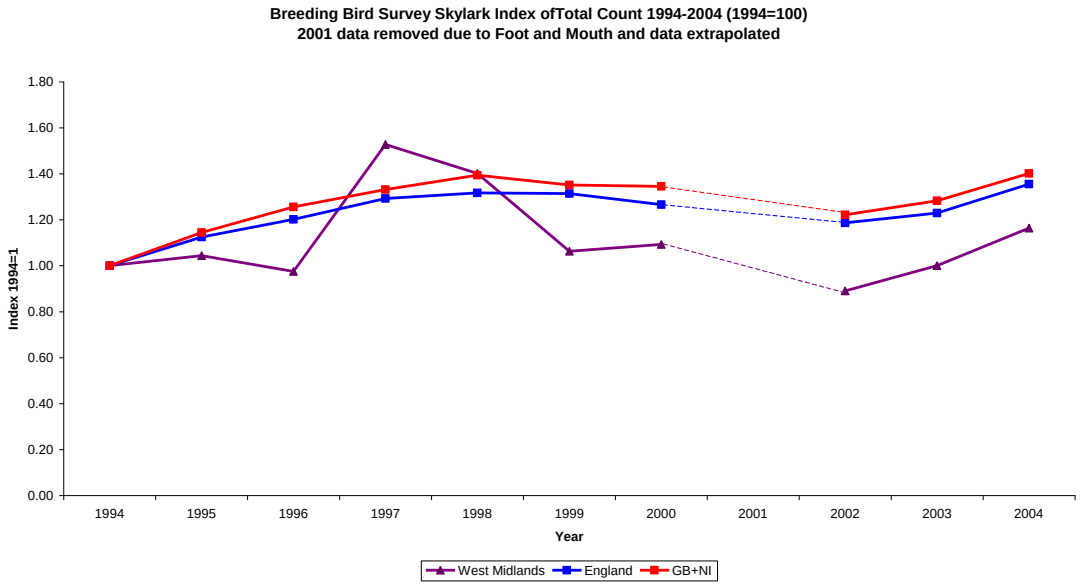
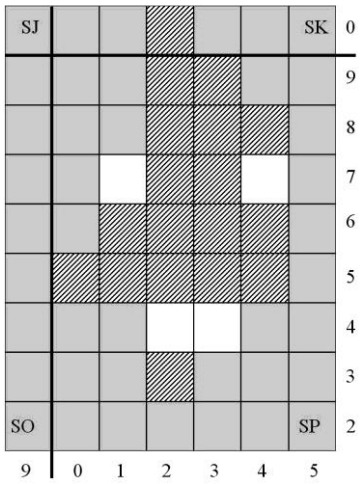


Figure 25. Distribution of Skylarks in Warwickshire.

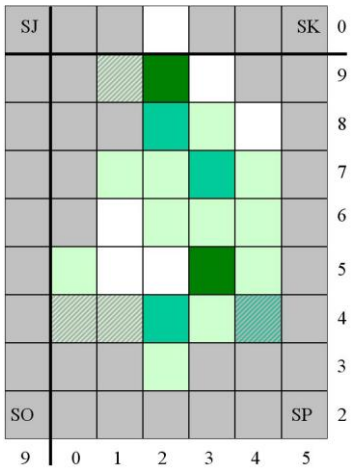
Breeding Distribution – Hatched area in 1966-68 represents breeding.

1966-68



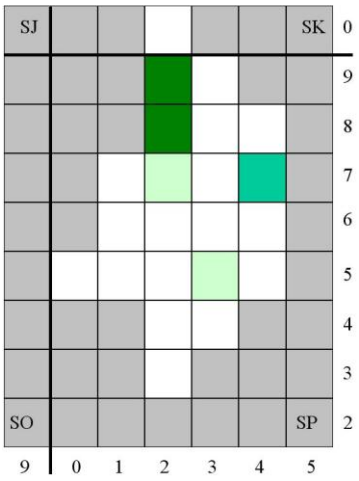
(After Lord and Munns, 1968)

1996-99



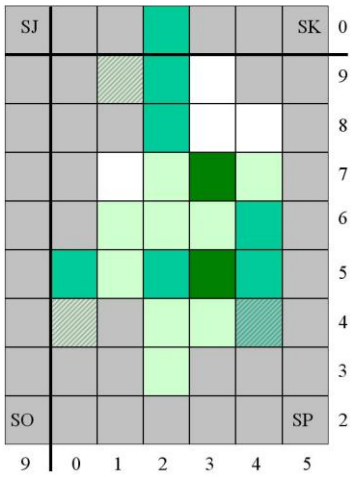
(WMBC Annual Reports)

1988-91



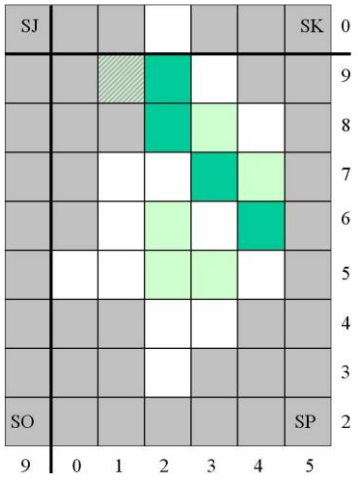
(WMBC Annual Reports)

2000-03

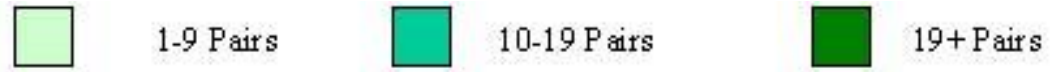


(WMBC Annual Reports)

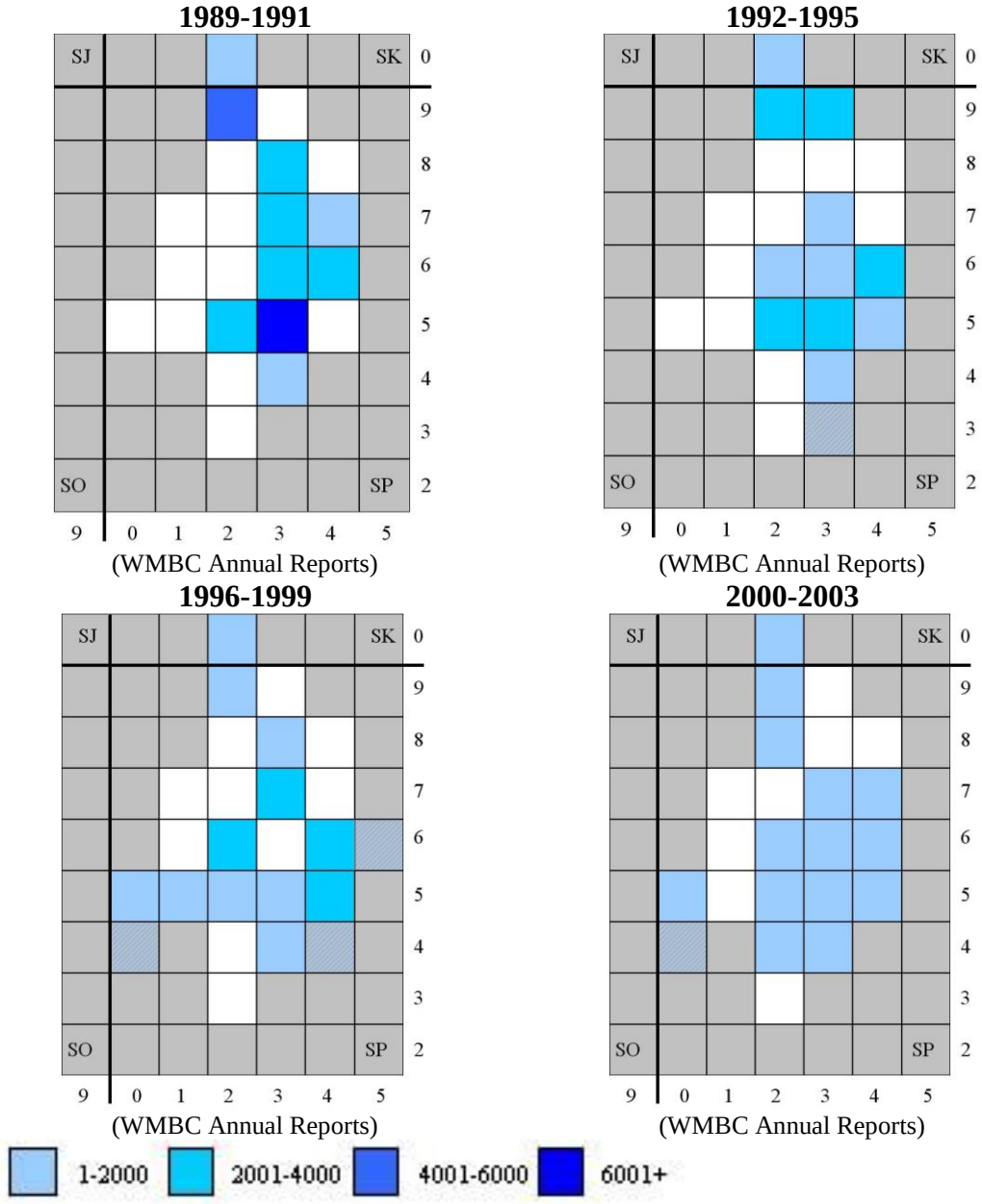
1992-95



(WMBC Annual Reports)



Winter Distribution



MONITORING

Monitoring of the Skylark is probably more practical in Warwickshire if it is combined with the other farmland passerine (See Section 3). The survey consisted of 4 visits between mid-April and mid-June. Singing and non-singing Skylarks are plotted on a base map to establish territory boundaries and therefore the number of pairs in a given area.

For wintering individuals a joint JNCC and BTO in 1997 and 1998 outlined a methodology in which a single visit in November, December and January were made to sites to count flock sizes (Gilbert et al, 1998).

COMMON SNIPE (*Gallingo gallingo)*

STATUS INFORMATION

Status:

A – Species recorded naturally since 1950 (Brown and Grice, 2005).

Regional Status:

Fairly common winter visitor and passage migrant. Frequent but much declined breeding species (Harrison and Harrison, 2005).

Index of Abundance: 8 - Abundant

Population Estimates: 4,400-8,800 pairs in England 1988-91 (Brown and Grice, 2005). 52,500 breeding pairs and >100,000 wintering individuals 1985-99. (Baker et al, 2006).

Snipe have a wide distribution and it is estimated that there are 2.4-2.9 million wintering birds in Europe and West Africa. Nationally there has been a 19% fall in numbers between BTO Atlases 1968/72 -1988/91 (Brown and Grice, 2005). In the West Midlands in particular a 2002 survey registered 108 sites with a density of 0.02 pairs per Km, which represented a 93.9% decline from an initial study in 1982 (Wilson et al 2005). This local trend was mirrored in national surveys, which over the same period exhibited a 61.8% decline (Wilson et al 2005).

Analysis of data collected from the Breeding Bird Survey illustrates some recovery in this species between 1994 and 2001. This recovery however, seems to have been arrested from then on (Baillie et al, 2005).

National Distribution:

Present in 54% of 10km squares in England 1988-91 (Brown and Grice, 2005).

SPEC Category:

None

EU Threat Category

None

UK Conservation List:

Amber – Medium Conservation Concern. 50% population decline (Data possibly unrepresentative.)

Legal Protection:

Wildlife and Countryside Act 1981 Schedule 2(I) and 3(III)

SPECIES INFORMATION

Social Organisation: Territorial (Wernham et al 2002)

Age at First Breeding: 2 (Wernham et al 2002)

Breeding Season:

Breeding Starts in mid- April and lasts 16 weeks (Wernham et al 2002). Snipe have open nests into which 1 brood of 4 eggs (mean) are laid.

Survival Rate: 0.62 (Wernham et al 2002)

There has been a small improvement in egg stage nest failure rates (approx -0.0172 nests per day 1968-2002) (Baillie et al 2005).

HABITAT INFORMATION

General Habitat:

Wet grasslands, uplands and bodies of water.

Breeding Habitat:

Guidance by English Nature suggests that Snipe require soft damp ground for feeding and a tussock sward for cover in large open fields. Chick and nest survival is highly dependant on low stock densities. Optimum stocking rates should be no higher than 1.25 cows per ha and 7.5 sheep per ha (Kirby et al 2000) although specific guidelines issued by English Nature suggests a lower stocking rate of 0.75 cows per ha with a habitat consisting of 30-40% short sward, less than 20% Bare ground, tussocks of grass over 20-70% of the land with soggy or wet ground under 10cm of water over 20-30% of the land (English Nature, 2002b).

Non-Breeding Habitat:

Out of the breeding season Snipe require unrestricted views over 200m and an effective field size of 10ha for predator avoidance and display purposes.

They rely on a high frequency of wide shallow margins which are 20-30cm wide over greater than 30% of the wetland margin that can be either standing or running water (Kirby et al 2000).

Wet fields with many surface pools or ditches are ideal for feeding (Kirby et al 2000).

FEEDING AND BEHAVIOUR INFORMATION

Food Requirements:

Snipe require lots of bare soil to find ground dwelling insects such as earthworms, dipteran flies, beetles, ants, caddis flies, spiders and lepidoptera (Kirby et al 2000). Feeding often takes place at water margins.

Migratory Habits:

Whilst Snipe breed extensively on wetlands in winter they become less localised and forage widely. The median distance moved by Snipe between the breeding season and winter is 272km with Autumn movements occurring from August (Wernham et al 2002)

In Warwickshire WeBS data illustrates that the greatest arrival of winter visitors occurs in September with flocks remaining until April. Few if any remain for the breeding season anymore, only 1 individual remained in May at Brandon in 2003 and evidence of drumming (courtship displays) in the mid-1990's were only of solitary birds (WMBC).

CAUSES OF DECLINE

Loss of wetlands in the county has not helped but even in 1947 only a few pairs were resident and breeding at Sutton Park. This colony survived until 1968 (Lord and Munns, (1968).

Increased stocking densities and less permanent wet grasslands have reduced and restricted breeding sites.

BENFECIAL MANAGEMENT

- Lower stocking densities
- Control of predators at breeding sites
- Habitat enrichment – targeted at core areas such as Brandon Marsh, Tame Valley, Lighthorne Quarry, Ladywalk and Wormleighton regions.

COUNTY DISTRIBUTION / BASELINES

In Warwickshire the distribution of Snipe has contracted. The 1966-68 breeding atlas illustrated a wide distribution with confirmed breeding in at least 4 10km squares this fell to only 2 squares by 1988-92. The last pair of Snipe to breed in Warwickshire was in Kenilworth (SP27) in 1997 (WMBC).

Figure 27 shows how the species range has changed in the past 15 years and how it compares to that of 1966-68. It reinforces the fact that whilst breeding sites have reduced wintering locations seem secure. There are two concentrations of Snipe, the Tame Valley in the north of the county and the farmland in the south.

Figure 26 confirms the decline of breeding in the county whilst there has been a general increase in Snipe numbers in the past 15 years. It shows an increase in wintering sites, which seems to be dropping off from 2001 onwards.

Figure 26.Graph showing Snipe populations and the number of sites Snipe have been recorded in between 1988 and 2003.

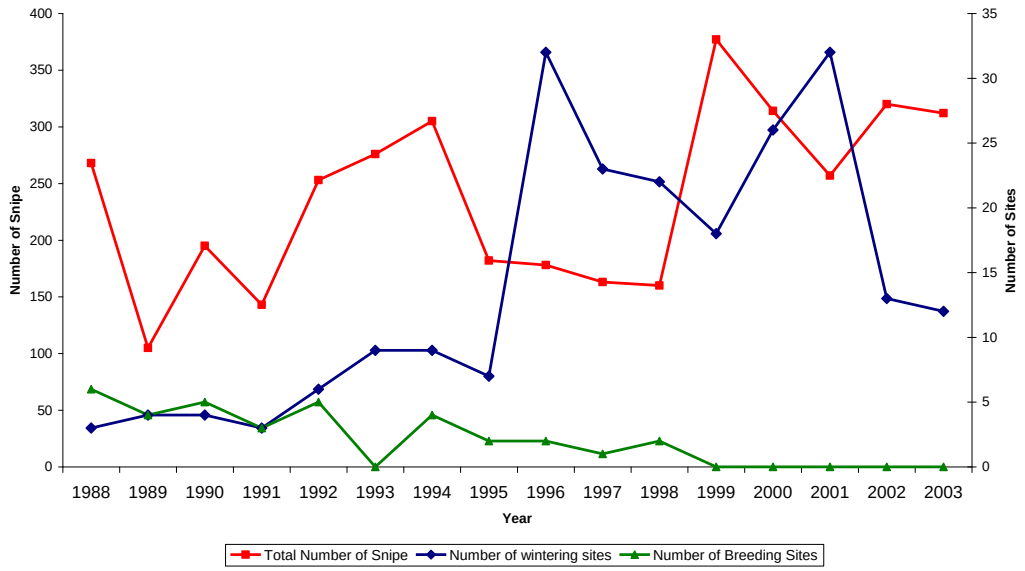
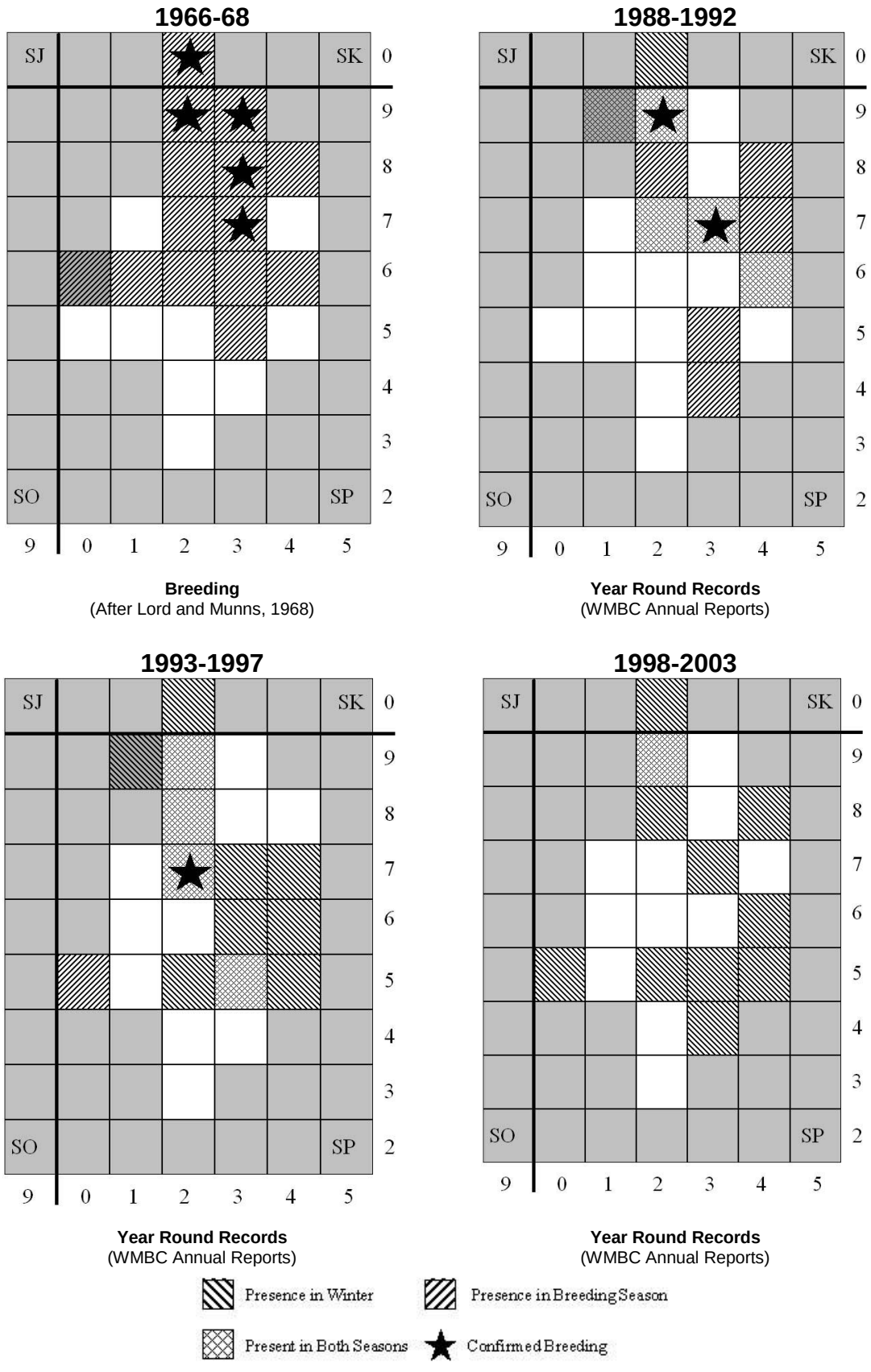


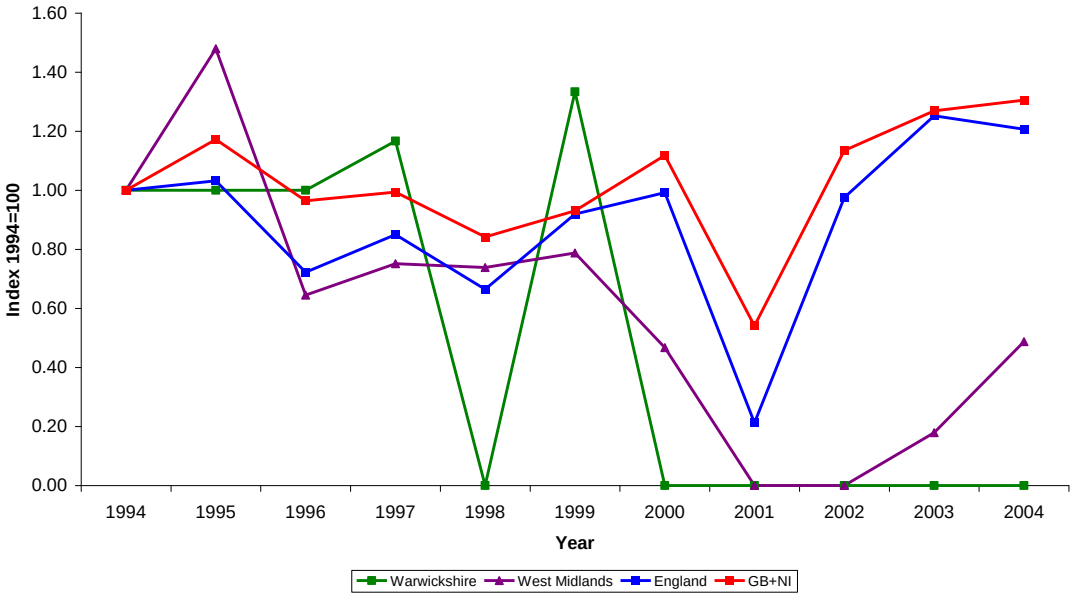
Figure 27. Distribution Maps for the Common Snipe



Breeding Bird Survey

The coverage of the BBS in Warwickshire is too low to base much analysis however counts for the West Midlands and Nationally help to illustrate the current state of Snipe populations. Figure 28 shows the population as relatively stable nationally with some increase from 1998. In the same time period however numbers in the West Midlands seems to have fallen with some recovery from 2003.

Figure 28. Graph showing the Frequency of Snipe Regionally and Nationally.



Wetland Breeding Bird Survey

WeBS counts have been carried out at key sites. Data from 2000 to 2003 was gained and illustrates a number of core sites in the county where Snipe occur nearly all year round and where breeding has occurred in the past. Figures 29 and 30 confirm that Snipe are being recorded at more sites and that total counts in the period where consistent and stable, although yearly maximas have declined very slightly. Two key areas can be identified from the WeBS data as places important for Snipe both for over wintering and for breeding, these are Brandon Marsh and Tame Valley including Coton Pools. These sites have regular Snipe sightings and show potential for becoming key resources in the county for re-establishing this species.

Figure 29. Yearly Maxima Snipe Counts for Key Sites 2000-03

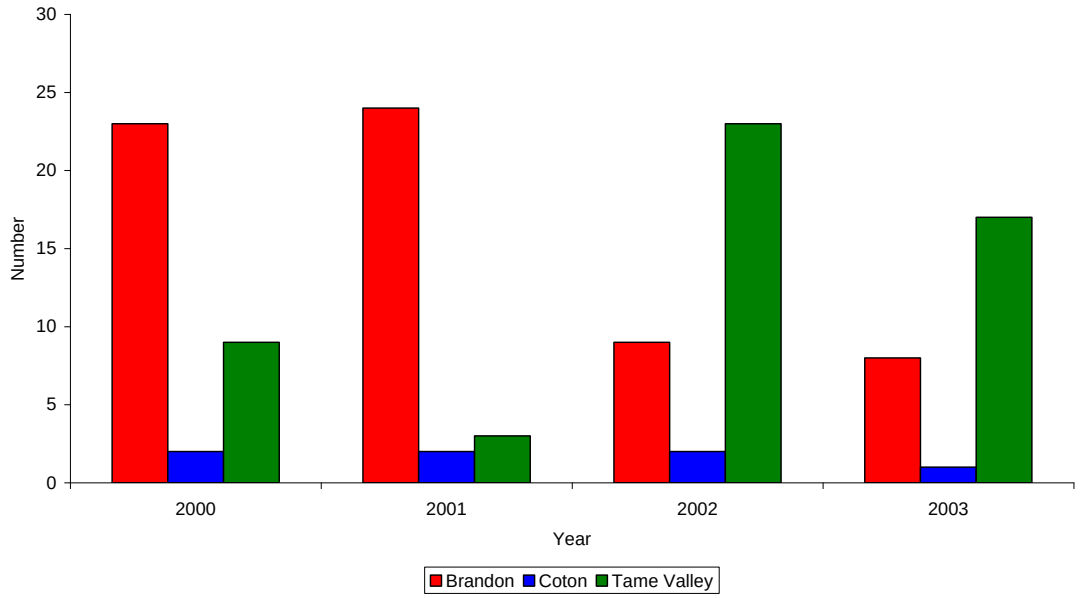
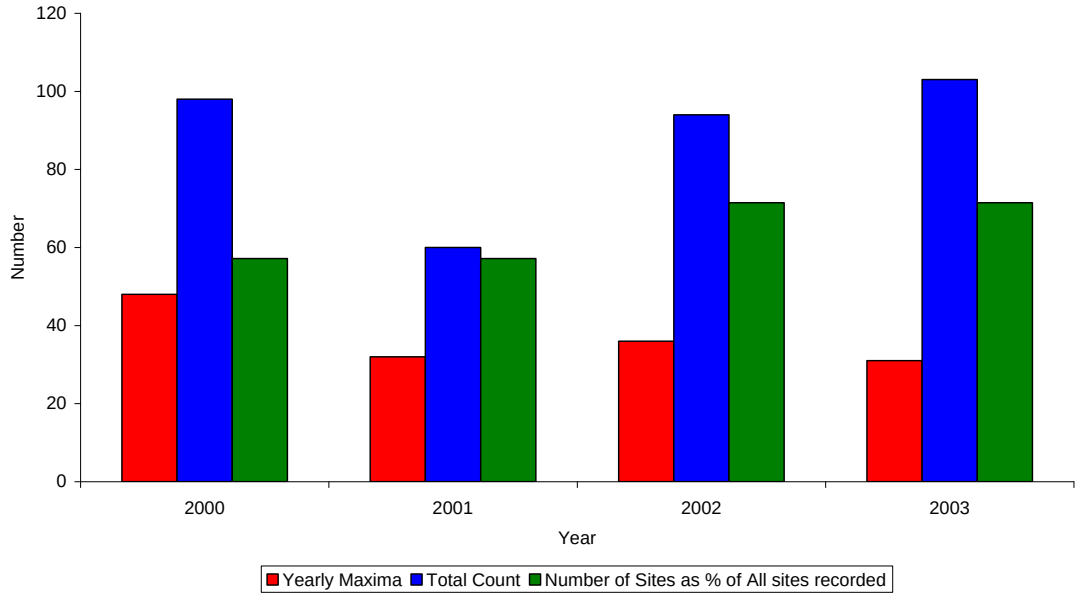


Figure 30 County Maximas, Total Counts and Ratio of Sites.



MONITORING

There are no specific methods for monitoring Snipe. Generic methods such as the BBS and Waterways BBS are used to measure populations in the Breeding Season and WeBS cover winter counts.

Given the coverage of WeBS in the County the data collected there has the potential to form an informal monitoring programme. The data is readily available and covers key sites in the county. Snipe are a notoriously difficult species to see, surveys could be arranged to target likely regions to count the number of drumming males to give an estimate of breeding but the amount of ground that would need to be covered to make the survey meaningful would probably not tally with the number of surveyors that could be mustered.

SONG THRUSH (Turdus philomelos)

STATUS INFORMATION

Status:

A - Species recorded naturally since 1950 (Brown and Grice, 2005).

Regional Status:

Much declined, though still abundant, resident, passage migrant and winter visitor (Harrison and Harrison, 2005).

Index of Abundance:

9 – Extremely Abundant

Population Estimates: 990,000 territories (Brown and Grice, 2005). 1,030,000 territories best estimate 2000, (Baker et al, 2006).

Song Thrush populations have shown a dramatic fall of 72% between 1967 and 1999 (Brown and Grice, 2005).

National Distribution:

Present in 100% of 10km squares in England in1988-91 (Brown and Grice, 2005)

SPEC Category:

4 – Populations are concentrated in the EU and have favourable conservation status.

EU Threat Category

None

UK Conservation List:

Red

Legal Protection:

Wildlife and Countryside Act Schedule II/2 and EU Birds Directive Annex 3 (I)

SPECIES INFORMATION

Social Organisation: Territorial (Wernham et al, 2002).

Age at First Breeding: 1 (Wernham et al, 2002).

Breeding Season: Start of May and runs for 19 weeks (Wernham et al, 2002)

Song Thrush lay from week 11 with clutch sizes of 4.

Breeding Dispersal Distance: 4 km (Wernham et al, 2002).

Natal Dispersal Distance: 7km (Wernham et al, 2002).

Survival Rate: 0.563 (Wernham et al, 2002).

HABITAT INFORMATION

General Habitat:

Song Thrushes inhabit a variety of habitats from woodland, fields and towns. Studies in 1989 showed densities in woodlands to be 25 territories per km^2 and in farmland 5 territories per km^2 (Brown and Grice, 2005). Work by Mason (2005) has revealed that extinction rates of Song Thrush in woods are 20-30% in woods less then 10 ha in size illustrating a requirement for large stable woodlands (Brown and Grice, 2005).

Success in agricultural landscapes is variable, they have been shown not to select fallow in set aside despite the expectation that the increased invertebrates provided by them would be of benefit (Buckingham et al, 1999).

Breeding Habitat:

During the breeding season Song Thrushes requires patches of mature scrub for nesting and short grassland for foraging (Kirby et al, 2000).

Non-Breeding Habitat:

Outside of the breeding season Song Thrushes are dependant on fruit bearing plants and areas with greater than 25% of holly, hawthorn or blackthorn (Kirby et al, 2000).

FEEDING AND BEHAVIOUR INFORMATION

Food Requirements:

Song Thrushes have a varied diet of fruit and insects. They are particularly dependant on fruit crops in autumn and winter. Invertebrates such as

Earthworms and snails are taken throughout the year (Snow and Perrins, 1998; Kirby et al, 2002).

Migratory Habits:

Most British populations of Song Thrush are sedentary. Those that are migratory tend to be more northerly. Incoming populations are from France and Spain (Wernham et al, 2002).

CAUSES OF DECLINE

The change in Song Thrush numbers is filled with contradictions, between 1966 and 1981 there was no change in breeding success and the success of each nesting actually increased despite a falling population (Brown and Grice, 2005). First year survival has declined since 1975 (Brown and Grice, 2005) suggesting that whilst breeding is successful many individuals are not reaching maturity.

Evidence from the Farmland CBC has shown that percentage abundance has fallen dramatically but presence/absence in 10km squares didn't alter. This suggests that there is no contraction of range (Brown and Grice, 2005).

One key factor is likely climate, Song Thrushes are notoriously vulnerable to cold winters (Brown and Grice, 2005) and in the midlands the severe winter of 1962/63 drastically reduced populations (Lords and Munns, 1968). The fact that recovery from this decline only took 2 years illustrates the species potential for resilience.

It is likely that climatic changes affecting the fruiting of key food plants and the availability of invertebrates are key to their decline. The reduction and isolation of woodlands and changing agricultural practices in the past 50 years have all contribute to a decline, reducing nesting sites and foraging territories.

BENFECIAL MANAGEMENT

- Protection of Woodlands
- Provision of fruit bushes
- Garden Feeding

Increase in Hedgerows and Beetle banks to increase invertebrate habitat.

COUNTY DISTRIBUTION / BASELINE

Song Thrushes are under recorded in WMBC Annual Bird reports, many consider them too common to warrant recording and submitting to the County Recorder, and therefore the data is both limited and often skewed. As a result the data from the WMBC can only really be used to identify a number of key sites.

One such site is Wormleighton, here large flocks of Thrushes have been sighted every winter since 1996 with numbers consistently in the 200-400 range (Fig. 31). The second site is DM Kineton the army base in south Warwickshire. This site has had regular counts made in the breeding season and has there are consistent records from 1993 (Fig 31).

Figure 31. Table showing Key Site Information

	Breeding Pairs				Maxima Winter Flocks	
	Bidford on Avon	Birchmoor	Dosthill/Kingsbury	DM Kineton	Fenny Compton	Wormleighton
1994	10					
1995	9			69	400	
1996	9			34	250	
1997	5			40	150	210
1998	10		13	30	120	165
1999	7	7	16	39	150	
2000	11	11	10	63	120	170
2001		11	8		140	300
2002	9	11	8	73	150	300
2003				74	185	100

Breeding Bird Survey

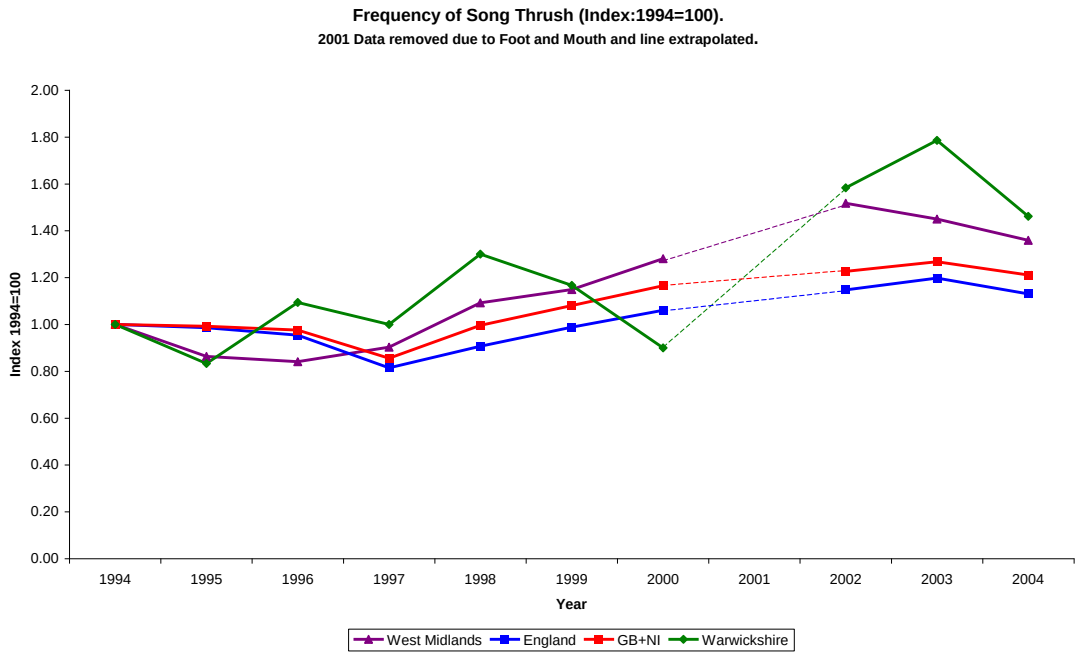
Data derived from the BBS (Figure 32) shows a rough increase in Song Thrush numbers with numbers slightly better in the West Midlands as compared to the national picture.

MONITORING

Given that Breeding Bird Data is so un-representative for the county monitoring of Song Thrush is particularly difficult. There are no set procedures for monitoring specifically this species. It makes the most sense to run a focused survey in the breeding season to assess the number of pairs in the county. Records from DM Kineton give a good baseline for comparisons and

give a general feel for trends in Song Thrush productivity and survival it doesn't however help assess the strength of the species in the rest of the county.

Figure 32. Regional and National BBS Analysis of Song Thrush Populations



Song Thrush's breed in woodland and parkland and it would be worth undertaking a targeted survey of breeding in a selection of core woodlands in the county. Such a survey should use a territory mapping approach.

TREE SPARROW (Passer montanus)

STATUS INFORMATION

Status:

A – Species recorded naturally since 1950 (Brown and Grice, 2005).

Regional Status:

Fairly common but declining resident (Harrison and Harrison, 2005).

Index of Abundance:

8 – Abundant (Brown and Grice, 2005).

Population Estimates: 68,000 territories 2000 best estimate (Baker et al, 2006)

Tree Sparrow numbers have seen a remarkable and drastic fall in the last 40 years. According to CBC plots between 1967 and 1999 populations fell by 94% with an accompanying retraction in range indicated by a 17% reduction in the number of 10km squares it was recorded in (Brown and Grice, 2005).

National Distribution:

Present in 67% of 10km squares in 1988-91 (Brown and Grice, 2005).

SPEC Category:

3 – Whose populations whilst not concentrated within Europe have unfavourable conservation status (Brown and Grice, 2005).

EU Threat Category

None

UK Conservation List:

Red – High conservation concern. >50% population decline (Brown and Grice, 2005).

Legal Protection:

None

SPECIES INFORMATION

Social Organisation: Colonial (Wernham et al, 2002).

Age at First Breeding: 1 year (Wernham et al, 2002).

Breeding Season: Begins in the start of April and lasts 12 weeks (Wernham et al, 2002).

The Tree Sparrow nests predominantly in holes in monogamous pairs (Snow and Perrins, 1998). On the whole they nest in small colonies but will also nest individually up to 1km apart (Brown and Grice, 2005) (Snow and Perrins, 1998). The female lays on average 5 eggs per clutch and can have up to 3 clutches in a season, 75% of pairs have a second brood and 40% a third. (Snow and Perrins, 1998) (Brown and Grice, 2005).

Breeding Dispersal Distance: 5km (Wernham et al, 2002)

Natal Dispersal Distance: 8km (Wernham et al, 2002)

Survival Rate: 0.433 (Baillies et al, 2005)

HABITAT INFORMATION

General Habitat:

Tree Sparrows are birds of lowland farmland (Brown and Grice, 2005). They occupy mixed farmland or parkland with mature hedges and trees (Kirby et al, 2000). They occupy suitable habitats only patchily with periods of desertion and colonisation (Snow and Perrins, 1998).

Tree Sparrows particularly favour pollarded willows and trees with abundant holes for nesting (Snow and Perrins, 1998). They feed on seeds and fruit bearing plant and areas with >25% cover of *Stellaria, Chenopodium* and *Triticum* species are beneficial (Kirby et al, 2000).

Breeding Habitat:

In the breeding season an abundance of tree holes is required in which to nest. These tree cavities need to be <35mm in diameter and >1.5cm deep (Kirby et al, 2000).

FEEDING AND BEHAVIOUR INFORMATION

Food Requirements:

Tree Sparrow feed mainly on seeds, buds and berries although they do take insects (Snow and Perrins, 1998). Seed plants such as *Stellaria, Chenopodium* and *Triticum* species are particularly important (Kirby et al, 2000).

Migratory Habits:

Tree Sparrows are essentially sedentary but some movement does occur out of season when they form flocks of adults and juveniles. These flocks can wander over 10-100km (Snow and Perrins, 1998). Most long-distance movements if any are made are usually of juveniles (Wernham et al, 2002). Post-fledging dispersal is usually 10km from the natal site (Brown and Grice, 2005). Despite being generally sedentary there is some evidence that there is some net southerly movement of individuals in the autumn and winter (Wernham et al, 2002).

CAUSES OF DECLINE

Breeding productivity has improved over the years (Brown and Grice, 2005). Between 1968 and 2002 brood size has increased considerable in line with a decline in both egg failure rates and chick failure rates (Baillies, et al 2005). These increases have occurred whilst population levels have crashed. This confirms that species productivity is not a cause of decline. More likely the change in agricultural practices have had impact. The intensification of farming and the reduction in over wintered stubble and therefore a key source of food both contribute significant barriers to Tree Sparrow survival. The loss of hedgerows and therefore potential nest trees likewise limits the ability for the species to survive.

BENFECIAL MANAGEMENT

Strong evidence for the Tree Sparrow aggregating on winter stubbles was shown in 2003 and studies in to the success of Arable Stewardship schemes in the West Midlands showed a significant positive effect between 1998 and 2000 (Bradbury and Alen, 2003), therefore the protection of winter stubbles

and the protection of existing hedgerows would go some way to helping secure the population.

It is noted that the Tree Sparrow is known for its unexplained colonisation or desertion of key sites, this could represent a high degree of sensitivity to the habitat in general. It taking very little change to prompt a move from an existing colony. The fact that colonisation seems as easy as desertion does offer hope and that if an area can be improved it is more likely for a new colony to establish themselves especially given the spread of winter flocks in the county. It is these juvenile heavy flocks that hold the chance of recolonisation.

COUNTY DISTRIBUTION

Figure 33 illustrates clearly the degree to which the range and density of the Tree Sparrow has increased in the past 15 years back to a breeding distribution in line with what it once was in 1966-68. It shows that this species declined heavily between 1968 and 1988 whereupon its range was limited to a handful of sites and breeding pairs in mainly the north of the county. Slowly the Tree Sparrow has recovered until now it is present in all but 3 10km squares in the county with important densities in the southeast on the Oxfordshire border.

In terms of the number of sites used by the Tree Sparrow the data from the WMBC annual reports reinforces the spread of breeding sites (Fig. 34 and 35). Winter distributions are generally restricted to fewer sites and over the past 15 years have exhibited a relatively stable population level, which indicates either low productivity from Warwickshire pairs or the movement of numbers out of the county (Fig. 34 and 35).

Figure 33. Breeding Distribution of Tree Sparrows

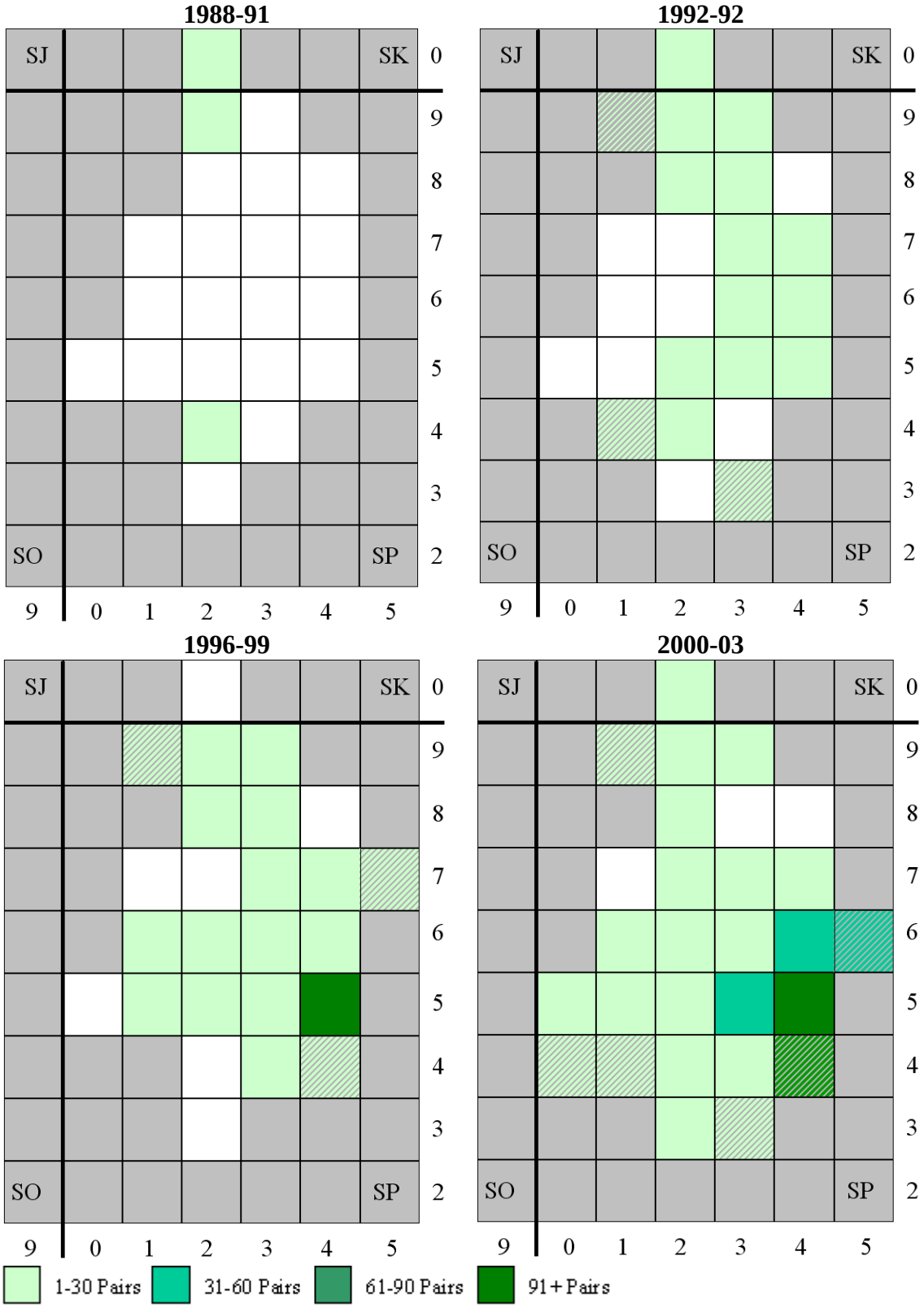


Figure 34. Graph showing the difference in the number of sites Tree Sparrows have been recorded at in the Breeding season and over the winter between 1998 and 2003.

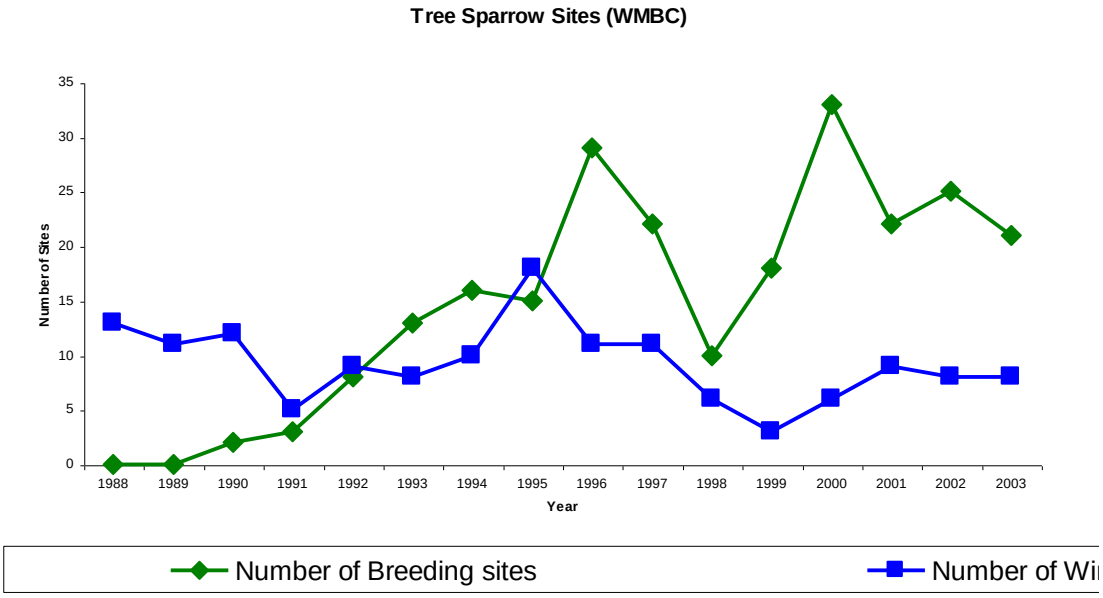
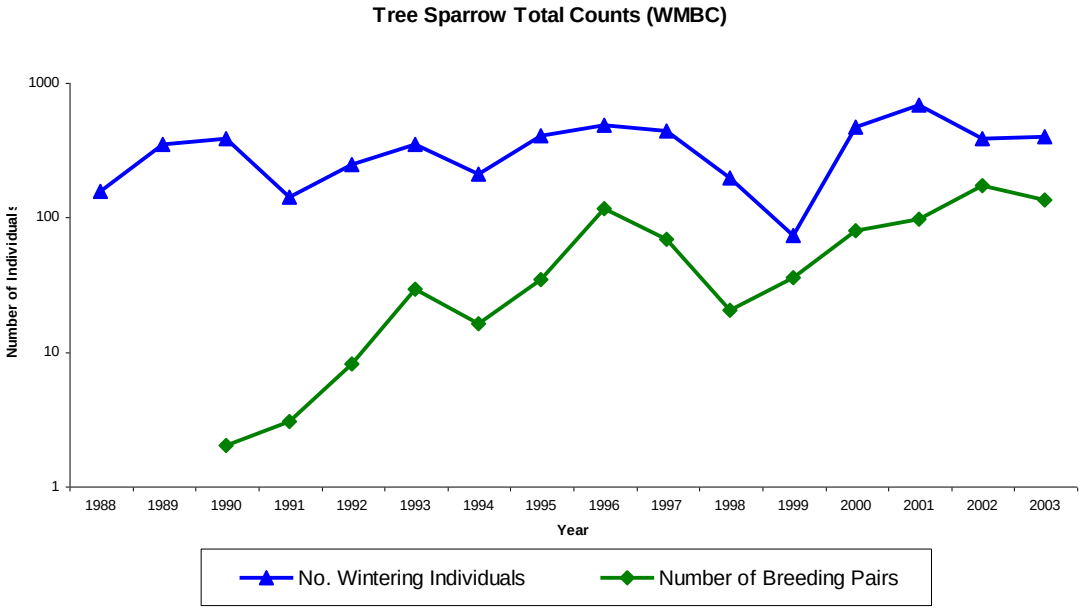


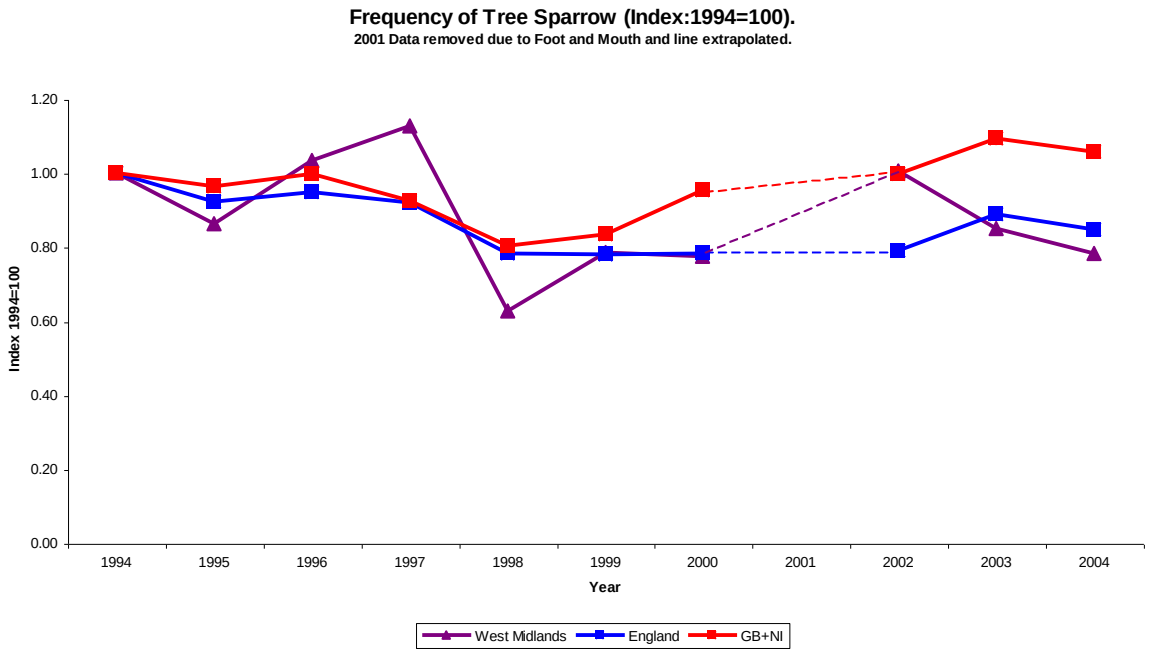
Figure 35. Total Counts of Tree Sparrows from 1988-2003 (WMBC)



Breeding Bird Survey

Like the Skylark, Tree Sparrow numbers reflected in the BBS illustrate little regional or national deviations (Fig. 36). In contradiction to the general increase in numbers reflected in the WMBC the BBS indicated a falling population from 1994 to 1999 whereupon only a marginal recovery to 1994 levels was achieved. This could indicate that Tree Sparrows are doing better in Warwickshire than across the region as a whole.

Figure 36. Regional and National BBS Assessments of Tree Sparrow numbers.



MONITORING

Tree Sparrow monitoring should be combined with the other farmland passerines to maximise efforts (See Section 3). Tree Sparrows are usually surveyed just prior to the breeding season to establish usage of tree cavities by pairs. Subsequently 6 visits are made throughout the season to monitor occupancy. Tree Sparrows are monogamous and territorial despite colonial nesting so nest occupancy should equate well to the number of breeding pairs.

Section 3 - Monitoring

Whilst each species section dealt with monitoring there is the question of wider monitoring schemes. Firstly the County Recorder Jonathon Bowley is working on a Tetrad Atlas (Bowley, J. pers comms) this should prove to be a valuable resource in mapping species distributions on a far finer scale than the 10km squares used in this analysis. Secondly the BTO's programme of Atlas production is nearing once again. Where in the past the BTO has produced separate Breeding and Winter Atlases this time the two will be combined with countywide survey work running between 2007 and 2011. Survey techniques are still being tested but it is expected to be similar to the techniques used in the previous Breeding Atlas (1988-91). Then the survey used complementary techniques of timed and random visits. This survey therefore provides an excellent opportunity to get not only surveyors and people involved but to establish sound distribution and possibly population levels in the county.

From the perspective of the BTO Regional Representative it may be difficult to continual use the same surveyors for all the BTO surveys and any additional ones the county may wish to run for fear of over working volunteers. Careful co-ordination of surveys however should alleviate this concern.

Figure 37 gives an overview of the monitoring suggested in text.

Farmland Bird Monitoring

Monitoring of Corn Bunting, Skylark and Tree Sparrow should be conducted through a single Farmland Survey. This survey could also incorporate Lapwing and Grey Partridge. The RSPB has run several Farmland Bird Surveys in the South of the county but this needs to be extended to be more representative of the whole county.

The appendix includes a suggested survey technique for a random survey of Tetrads in the county for the core farmland species.

Figure 37. Overview of suggested monitoring

Species	Suggested Monitoring
Barn Owl	None – use records submitted to County Recorder
Bittern	None – use records submitted to County Recorder
Corn Bunting	Use Farmland Bird Survey (See appendix)
Grey Partridge	Use data collected from GCT. Use Farmland Bird Survey (See appendix)
Lapwing	Use WeBS data to monitor Key Sites. Implement Breeding survey to establish a baseline.
Skylark	Use Farmland Bird Survey (See appendix)
Snipe	Use WeBS data to monitor Key Sites. Implement Breeding survey to establish a baseline.
Song Thrush	Set up a survey of targeted woodlands to assess breeding density and distribution. Continue to monitor key populations (DM Kineton).
Tree Sparrow	Use Farmland Bird Survey (See appendix)

Section 4 - Evaluation and Suggested Future Research

This report outlines a promising outlook to many of the species. It appears that distributions and numbers have stabilised and increased in the region in the past 10 years. However, this increase in fortunes still leaves most of the species at lower population levels than some 40-45 years ago. It reinforces the need to continue to safeguard key habitats and species assemblages.

The overwhelming evidence from all the species analysis is the sensitivity of all the species to the landscape. The greatest efforts therefore need to continue to be with the landowners. Continued co-operation with landowners and organisations such as DEFRA, NFU and FWAG are vital to the survival of many of these species. Entry Level Stewardship and its allies promises to be an avenue upon which to continue to keep these species on the road to recovery, although until implemented and assessed down the line this is just supposition. Now is the time to set up mechanisms to assess the impact the various aspects of these schemes actually have on wildlife in Warwickshire.

The report also highlights the severe lack of detailed and scientifically rigorous data in the county. Much of the information available is very limited either in range or in scale. For the size of the county most surveys are under representative of the species they are covering and so give a skewed picture of either increase or decline. Hopefully Jonathon Bowley's Tetrad Atlas and the BTO's next Atlas can help tie up this gap in the coming years.

There is much that can still be done. It would be better if the distribution maps in this report could have been on a finer scale than $10km^2$, such efforts would take longer time and more resources. Additional species-specific actions could also be taken. It should be possible to use the Habitat Biodiversity Audit GIS to identify suitable habitats for species such as Bittern that as yet are not surveyed or monitored closely enough.

It is strongly suggested that the County Council encourages the establishment of a staggered monitoring scheme to initially lay down a firm

base line and then to regularly resurvey to assess the impact of the action plans. Such surveys could be done at very low cost by using volunteers or funded from sponsors or from grants such as those awarded by the West Midlands Biodiversity Partnership.

This report relied heavily on records made by the general public to the County Recorder. Greater publicity for the need for people to register their sightings to the WBRC and the County Recorder would be highly beneficial for all LBAP taxa. It is suggested that some sort of PR events could be held to raise the LBAP profile across the county – something akin to a Biodiversity Week in which a blitz on local press could be made and a range of events could be organised, such as guided walks, displays, talks and visits to schools.

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Section 6 – Appendix

Possible Farmland Bird Monitoring Scheme

The following survey outline suggests a possible survey to help monitor Farmland LBAP species.

Farmland birds make up a significant part of the species under LBAP's. In the past some survey work has been conducted in the south of the county and on the borders of Oxfordshire and it is perhaps more practical to extend this survey across Warwickshire.

Volunteers could undertake this survey with co-operation between the BTO, WMBC, RSPB and WWT local members groups.

Survey Aims

To establish a repeatable, simple and easy survey that could be completed in a single season, to assess absolute population estimates and distributions of breeding farmland birds in Warwickshire.

Survey coverage

There are 475 tetrads in Warwickshire. To provide the survey with enough data to be of any significance 83 tetrads would need to be surveyed with a confidence level of 95% and 123 for a confidence level of 99% (both have a confidence interval of 10%).

These tetrads should be distributed randomly in a stratified technique such as a random selection of between 4 and 6 tetrad per 10km squares. Tetrads with a largely urban nature could be discarded.

Number and Timing of Visits

2 visits between 1st April and 30th June.

Visits should be made early in the morning before 11.30am and last up to 1 hour and 30 minutes.

Weather Constraints

Conduct the survey only in fair to good weather. Avoid rain and high winds or conditions that impair visibility.

Site/Areas to Visit

The surveyor should attempt to cover all farmland in the tetrad.

Equipment

Recording Forms, OS Maps of the Area, Binoculars and Survey Forms.

Safety and Disturbance

Standard survey/walking safety should be maintained. Disturbance should be kept to a minimum any nesting sites discovered should be avoided.

Methods

Having been assigned a tetrad (4x 1km^2) the surveyor should walk a route that takes them to within 500m of all parts of farmland in the square.

They should mark on their base map the presence of the following species using BTO codes –

- Lapwing
- Tree Sparrow
- Corn Bunting
- Skylark
- Snipe
- Grey Partridge

Each species should be accompanied with a behaviour code to indicate Calling, Nesting or Carrying nesting material (Standard BTO codes).

There should be an effort to avoid counting the same individual twice in any survey.

Bird flying over or obviously not using the site should not be recorded.

Bird should be identified by sight and by song. Any birds not identified should not be recorded.

A simple record of the land usage of each field or enclosure should be included on a second map.

Analysis

- The number of breeding pairs of each species
- Population/Breeding Density
- Breeding Distribution
- Changes in range and numbers over time
- Relationship between agricultural land use and range and numbers

Future expansion/additions

It would be interesting and of benefit to target some of the surveys to compare farmland under different management schemes such as Entry Level Stewardship to see how effective such schemes could be in Warwickshire.