THE STATE OF LANCASHIRE'S BIRDS

An atlas survey of the breeding and wintering birds of Lancashire and North Merseyside, 2007-2011

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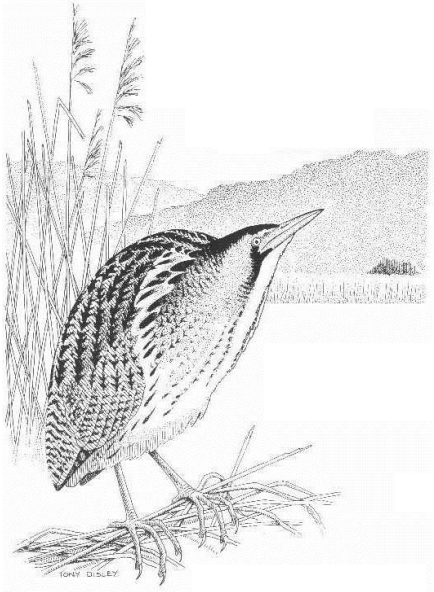
Lancashire and Cheshire Fauna Society

in association with the British Trust for Ornithology, East Lancashire Ornithologists Club, Rossendale Ornithologists Club, Lancaster and District Birdwatching Society, Fylde Bird Club, Chorley and District Natural History Society and West Lancashire Wildlife Group



Lancashire & Cheshire Fauna Society

BTO

British Trust for Ornithology

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East Lancashire Ornithologists Club

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Contents

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Mapping by Merseyside Biobank (the Local Records Centre for Merseyside)

Cover photograph by Mike Malpass.

Part One

INTRODUCTION AND METHODOLOGY

When the British Trust for Ornithology announced that it intended to carry out a national survey of breeding and wintering birds following up the last breeding and winter atlas surveys of 1988-1991 and 1981/82-1983/84 respectively, it was agreed by the Lancashire & Cheshire Fauna Society and the regional bird clubs to repeat the breeding survey of Lancashire and North Merseyside completed during 1997-2000 and to carry out the first winter survey of the 'county'.

Both the national and county surveys covered the breeding seasons of 2008 to 2011 and the winters of 2007/08 to 2010/11.

The purpose of the national surveys was to map bird distribution at the level of 10km squares, based upon a sample of at least eight tetrads in each square. This level of surveying was not felt to be adequate for a county atlas so it was decided to survey every tetrad in both summer and winter.

The methodology followed that used for the national surveys. In brief, observers were asked to carry out surveys for two one-hour periods (Tetrad Timed Visits or TTVs), counting every bird seen and noting all signs of breeding behaviour. Two such visits were carried out in each season: during April to May and June to July for breeding birds, and November to December and January to February in winter.

In addition, the BTO requested surveyors to carry out dusk surveys for nocturnally active breeding species within each 10km square. This was probably achieved satisfactorily for the purposes of the national breeding atlas but night-time surveys were only carried out for a minority of Lancashire tetrads, certainly in far fewer than during the 1997-2000 county survey. Comparisons of the status of species such as Woodcock and Tawny Owl between the two surveys are therefore probably a little less robust than for diurnal species, for which both surveys employed essentially the same methodology.

As well as the TTVs the BTO encouraged the submission of all relevant records (Roving Records or RRs) and in Lancashire these included all records submitted for publication in the annual county and regional bird reports as well as those entered into Birdtrack, returns from ringing and nest record schemes and results from the BTO's annual Breeding Bird Survey.

These RRs amounted to staggering totals of more than 150,000 records for both summer and winter.

After carrying out all TTVs observers were asked to estimate population totals for each species in each tetrad but only a minority did so. In the end not much use was made of these data but they were helpful in producing county-wide population estimates for some species.

The fieldwork in Lancashire was extended by one year into summer 2012 and winter 2011/12 to ensure full coverage of the handful of tetrads that had not received TTVs during the core atlas period. Roving records from these years were also incorporated into the final county database.

All records from timed and other visits were scrutinised in the first instance by the regional atlas organisers and queries regarding identification, numbers or breeding status were followed up with observers; only validated records have been used in the published accounts.

All validated records were passed on to the BTO for use in the national atlases. There should be a very close fit between the distribution maps produced here and in the national atlas but there will be a very small number of differences, caused either late receipt or late validation of records; in such cases the maps published here should be regarded as definitive.

INTERPRETING THE MAPS

Breeding

a) Status Codes.

The county and national surveys used the same codes for assessing breeding status. Proven breeding was indicated by the presence of nests with eggs or young, adults on nests or carrying food or faecal sacs, or recently-fledged young in suitable breeding habitat; probable breeding by the presence of pairs of birds, courtship display, alarm-calling, multiple singing males on any one day or single singing males over an extended period; and possible breeding by single singing males for short periods or simply the presence of birds in suitable breeding habitat. Additionally, birds were classified as summering if present with no indication of likely breeding, or as migrants.

b) Mapping Breeding Status.

The three principal codes, proven, probable and possible breeding, will be mapped separately in the national atlas but this is not appropriate at the county level. This is mainly because of the large number of ‘probables’ which, if mapped separately, would give a misleading impression, underestimating the true extent of breeding within the county, especially for common species. The categories probable and proven were thus merged and mapped with a single symbol; this is in line with the maps produced for 1997-2000 county breeding atlas.

It is important to bear in mind that changes mentioned in the text refer only to changes in distribution, i.e. tetrads occupied during the two surveys. There is no way of relating these to changes in population size, for which the best indications are given by the national Breeding Bird Survey.

c) Breeding Changes since 1997-2000.

The maps show changes in distribution between the 1997-2000 and 2008-2011 Lancashire surveys. They do not show the current distribution.

Not all species have been treated in the same way. For most species changes in the distribution of birds in all breeding status categories are mapped, but for about a third of the total only changes in probable or proven distribution are mapped, possible breeding being ignored. Species in the latter category include those which have summer feeding territories some distance from their nest site such as Barn Owl and Kingfisher, others where actual nest sites are straightforward to record and where presence in suitable habitat alone provides insufficient evidence, such as Sand Martin and Rook, and finally some migrant species such as warblers that are either known to sing during migration stopovers or where migrants significantly outnumber breeding birds, for example most ducks and many waders. Ducks raised a particular problem in relation to pairs displaying on their wintering grounds or on migration, many of which were logged, in strict adherence to the BTO codes, as probably breeding; all such records were scrutinised and many were downgraded simply to ‘migrants’.

The above criteria were also used for any quantitative analysis of distributional changes referred to in the text. A full list of which breeding categories have been used for each species is provided in Appendix 2.

d) Interpretation of changes in breeding distribution data.

For the 1997-2000 survey only tetrads with a significant amount of breeding habitat were included but, since the current survey also took place winter rather more tetrads were covered, several of them also in the breeding season.

In addition, a handful of tetrads that had been excluded in the previous breeding survey because less than half of their area was in Lancashire were included this time around.

Both kinds of additional tetrads are included in the maps but in order to ensure consistency with comparisons with the 1997-2000 survey they are excluded from the analysis of changes. These comparisons are therefore based upon the 928 tetrads that were covered during the breeding seasons during both survey periods, nine additional tetrads that were surveyed during 2008-2011 being excluded.

The average (mean) number of species recorded in each of these 928 tetrads increased from 44.3 in 1997-2000 to 48.1 in 2008-2011, an increase of 8.6%. A total of 90 species showed an apparent increase in range of 1% or more or had recently colonised, while only 44 appeared to be in decline or had become extinct, with the distribution of 13 species stable.

This is unlikely to have been the case in reality and is almost certainly a result, in part at least, of the vastly increased number of additional records received during the current survey. Although this extra coverage may have applied throughout the county it is known to have been most significant in the uplands of east and north Lancashire.

It is impossible to produce a precise correction factor to separate out genuine range increases from changes that were the result of increased survey effort; this will in any case vary between species.

However, it is likely that for most species – particularly those showing relatively small increases in distribution – the percentage changes could safely be reduced by five percentage points or so.

As a rule of thumb, therefore, only species showing an apparent increase in range of 10% or more are likely genuinely to have increased. We are thus more certain about which species are in decline than those that have increased and it is likely that all species showing a negative change or very small increase between the two surveys are definitely in decline; those showing apparent increases of, say, 5-10% may actually be either increasing, stable or declining and their current status may be best be regarded as uncertain.

This issue is not always referred to in the species' texts but should always be borne in mind.

e) Relative abundance in the breeding season

The BTO will map breeding densities using average numbers counted per hour on timed visits within in each 10km square.

There seemed little point in repeating this approach in the county atlas and although it would have been desirable to do so at the tetrad level this would have produced an incomplete picture, as in some areas many tetrads received only partial coverage by timed visits or none at all.

It was therefore decided not to map breeding density but rather to incorporate statements in the text of differences in relative abundance on a broad scale. The county was divided into four (unequal) areas with 10km squares with second numerators of four or above (i.e. SD34, SD44 etc.) defined as 'north' and all others including all SJ tetrads as 'south', while those beginning six or above (e.g. SD61, SD82 etc.) as 'east' and lower numbers as 'west'.

Comparisons were then made using the average for each area of the largest sum of the two one-hour counts made in each tetrad on a single day to give an indication of relative abundance. These 'regional' differences are only reported in the text if they were statistically significant.

Winter

a) Mapping distribution.

Unlike for the breeding season this was quite straightforward and the maps show simple presence or absence for each species.

As in summer, records from both timed and additional visits have been included.

b) Relative abundance.

It was possible to take a different approach to mapping relative densities in winter by using all the count data available and mapping at the tetrad level. This was because many more high-quality quantitative data were submitted, utilising both timed visit and additional records, in part because many species are far more gregarious than during the breeding season.

However, for many species, including many passerines, few tetrad totals will have been complete; it is, for example, much easier to know how many Knots frequent a tetrad than Robins. For such species it is important to remember that the scale accompanying the maps cannot be taken to indicate absolute numbers but rather enables comparisons between densities in tetrads.

Another issue of interpretation applies to most waders, wildfowl, pigeons and some passerines, for example Waxwing and Scandinavian thrushes, namely the problem of duplication. Where species move between tetrads either within or between winters their largest counts are mapped for every tetrad. This means that the maps show usage over the four winters of the survey combined and the figures accompanying the maps cannot be summed to produce an estimate of total population size.

c) Treatment of late and early migrants.

The winter period was defined as November to February inclusive.

This inevitably led to a number of late migrants in November being recorded as 'wintering' but this was relatively easy to deal with.

More intractable was the problem of species, particularly some waders like Curlew and passerines such as Skylark, that begin their return to upland sites in February. This has undoubtedly led to an overestimation of numbers actually wintering but it has not been possible to separate out these two classes of record, although the issue is referred to in the species accounts.

POPULATION ESTIMATES

A variety of methods were used to estimate county-wide population size in both the breeding and winter seasons. These varied in robustness from species for which numbers are either known with a high degree of accuracy because of targeted surveys or are scarce enough to be reported on fully in annual bird reports, through to those that were little more than informed guesses; *in extremis* the population size of some very abundant species such as Wren was simply estimated at 1% of the national population estimate, based upon the approximate land area of Lancashire and North Merseyside as a proportion of Britain as a whole. In between, others were extrapolated from either the tetrad population estimates or the number of pairs present provided by surveyors.

Population estimates are referred to in the species accounts and are summarised along with the level of confidence in their accuracy in Appendix 3 (breeding) and Appendix 4 (winter).

For most waterbirds population size was estimated as the average of peak WeBS counts for the survey period.

Although population estimates were published in the 1997-2000 Lancashire breeding bird atlas for most species they cannot be used to make accurate comparisons with the current survey as they were produced using different methods. However, they are reproduced in Appendix 3 and give a broad indication of the direction and scale of changes.

All national population estimates were taken from Musgrove *et al* (2013).

KEY REFERENCES

Musgrove, A., Aebischer. N., Eaton M., Hearn R., Newson S., Noble D., Parsons M., Risely, K. & Stroud D. (2013). Population estimates of birds in Great Britain and the United Kingdom. *British Birds*: 106

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SOME FACTS, FIGURES AND SUMMARY FINDINGS

SURVEY PARTICIPANTS

A total of 266 surveyors carried out timed visits and are listed in Appendix 1. The number of people contributing roving records in one form or another is not known but is certainly at least the same again.

The total time spent in the field on timed visits was in excess of 3500 hours in each season. If time spent gathering roving records was taken into consideration this total could well rise to 15000 hours or more.

TOTAL NUMBER OF BIRDS COUNTED

The quantitative data that underlie the maps and other analyses are staggeringly large and had to be simplified to a single figure for each species in each tetrad, representing the largest single counts made during the survey years. A total of 52,490 of these 'maximum day-counts' were calculated for the breeding season and 48,235 in winter. These produced totals of 884,347 individual birds counted in the breeding season and 4,394,437 in winter.

Of course, these included many records that were duplicated between tetrads and years and it is unlikely that they represent the total number of birds in the county with any great degree of accuracy, but they certainly indicate the huge effort expended by surveyors.

Population estimates for all species are given in Appendices 3 and 4 and summing these produces a rough total for all species present in Lancashire and North Merseyside during the breeding season of 530,000 pairs and in winter of 2,274,000 individuals, the latter figure roughly the same as the human population.

The 30 most numerous species in summer and winter are listed in Appendices 9 & 10, and the 30 most numerous in Appendices 11 & 12.

SPECIES RICHNESS

The number of species recorded with some evidence of breeding ranged between eight and 92 with an average of 48 per tetrad. These figures were broadly comparable with 1997-2000 when totals ranged from two to 90 species with an average of 44.

Species richness was slightly higher during winter with totals ranging from one to 129 and an average of 51 per tetrad.

The breeding species map below shows clusters of high species richness tetrads in Silverdale (SD47), the Lune Valley (SD57 & 67), eastern Bowland (SD64, 65 & 75) , West Lancashire (SD41), the West Pennine Moors (SD61) and St. Helens (SJ49 & 59). Totals for all 10km squares are shown in Appendix 5.

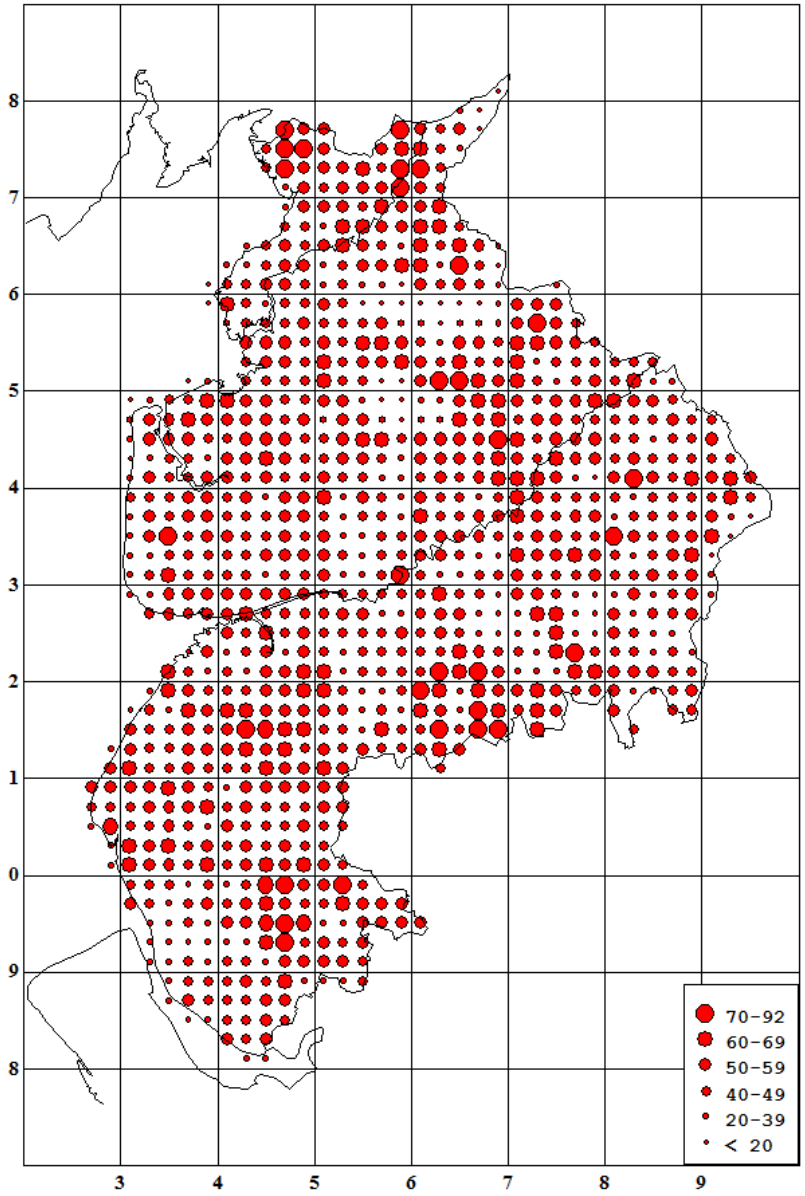
Totals for each tetrad are presented in Appendix 6 but the most species-rich tetrads were, in descending order: Belmont Reservoir, Longworth Clough/Delph Reservoir, Eric Morecambe complex, Winter Hill/Rivington, Leighton Moss, Stocks Reservoir North, Dunsop Bridge, Silverdale, Martin Mere, Higher Broomfield, Knowsley Safari Park, Prescot Reservoirs, Silverdale Moss/Gait Barrows/Haweswater and Sykes Nab.

The map of species richness in winter looks very different with the majority of the most productive species found on the coast and the coastal plain in the western third of the county. The full list can be found in Appendix 6.

Twenty-seven tetrads recorded more than 100 species; they were, in descending order, Martin Mere, Seaforth NR/Crosby ML, Marton Mere, Eric Morecambe complex, Prescot Reservoirs, Marshside North, Pilling Lane, Conder Estuary/Thurnham, Silverdale, Sunderland Point/Cockersand, Knott End, Pilling Marsh, Banks Marsh/Hesketh Out Marsh, Leighton Moss, Fluke Hall, Cockerham Sands, Stanley Park, Blackpool, Aldcliffe Marsh, Glasson, Little Singleton, Jenny Brown's Point, Brockholes Wetland, Fairhaven Lake, Burrow's Marsh, Downholland Moss East, Mere Sands Wood and Freckleton Naze.

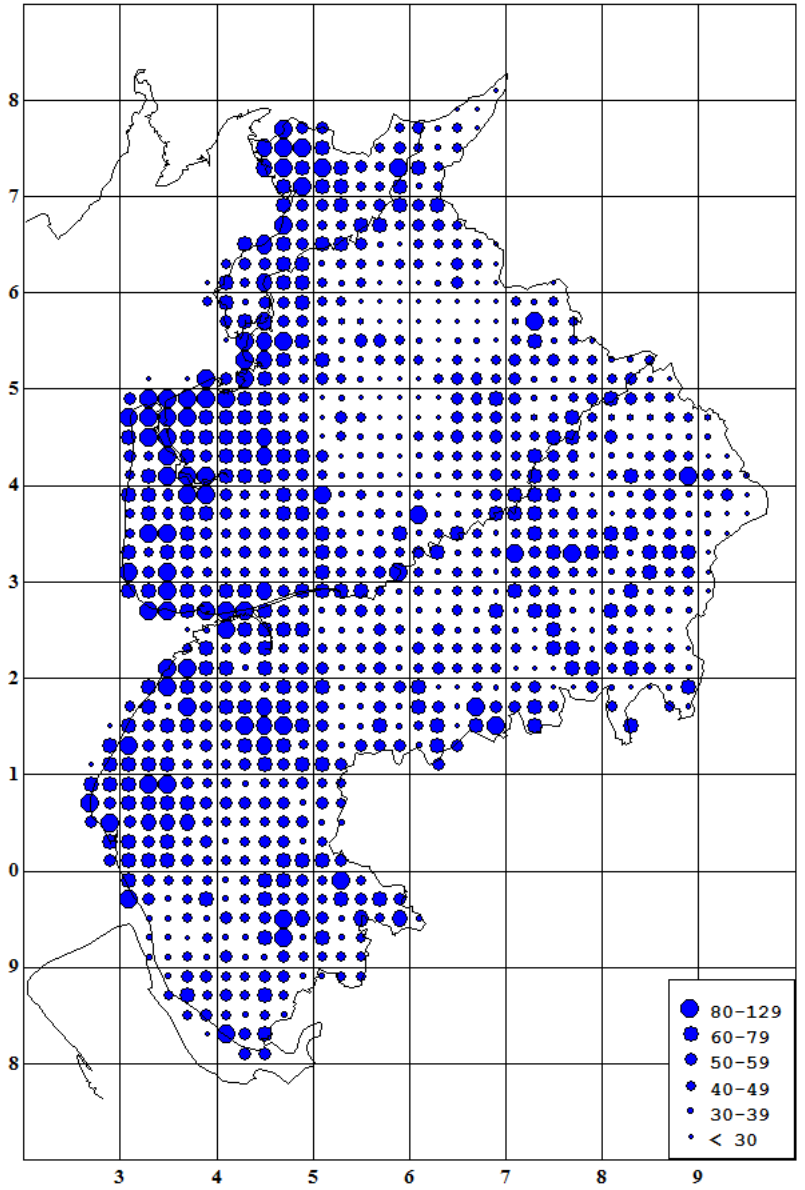
Breeding Species Richness By Tetrad

All species



Winter Species Richness By Tetrad

All species



SPECIES RECORDED

A total of 306 species was recorded during the four years of the survey, coincidentally with 237 in both summer and winter.

Escaped birds were excluded so that only those species in Categories A or C are dealt with in the species accounts, reducing the totals to 155 in the breeding season and 208 in winter. All species recorded are listed in Appendix 7 (summer) and Appendix 8 (winter).

EXTINCTIONS AND NEW COLONISTS

Only one breeding species, Turtle Dove, definitely became extinct in Lancashire and North Merseyside between the 1997-2000 and 2008-2011 surveys, although six others, Ruddy Duck, Hen Harrier (sine 2012), Black-tailed Godwit, Lesser Spotted Woodpecker, Hawfinch and Twite, seem to be on the brink of extinction. Spoonbill, which nested successfully in 1999, and Nightjar, whose earlier status was uncertain, have failed to become established as breeding species although the former continues to be recorded with increasing regularity.

Two species, Cetti's Warbler and Avocet, have colonised the county during the past decade, while two others, Ring-necked Parakeet and Mandarin Duck, have consolidated what appeared to be a tenuous hold as breeding species in 2000.

CHANGES IN BREEDING RANGE

Applying the thresholds outlined above, a total of 73 species have expanded their breeding range or colonised the county since 1997-2000, while 60 species have declined or become extinct; the remainder fall into the 'uncertain' category, having either remained stable or perhaps declined.

Although, as mentioned earlier, there is no clear-cut link between changes in breeding range and population size, these changes bear some similarity to the short-term changes in British bird populations monitored by the BBS which indicate that 59% of species are increasing while 41% are declining.

Sixteen species at least doubled their breeding range; in addition to those mentioned above these were Buzzard, Greylag Goose, Eider, Stonechat, Marsh Harrier, Hobby, Raven, Grasshopper Warbler, Lesser Redpoll, Nuthatch, Kittiwake, Mediterranean Gull and Red-legged Partridge.

At the other end of the scale four species suffered losses of more than 50% in their breeding range: Whinchat (-59%), Ruddy Duck (-59%), Twite (-85%) and Lesser Spotted Woodpecker (-94%).

All range changes are listed in Appendix 2.

It was perhaps unexpected to find that more species appear to be increasing than decreasing, although in the light of previous caveats these may be roughly even. However, there were very large differences between groups of species.

The majority of predominantly wetland species showed an increase in range with only one, Ringed Plover, clearly in decline.

It was a somewhat slightly less positive picture for woodland species with 13 out of 28 expanding their breeding range but with eight, Lesser Spotted Woodpecker, Wood Warbler, Spotted Flycatcher, Marsh Tit, Willow Tit, Tree Pipit Hawfinch and Woodcock, showing large declines.

This broadly-speaking optimistic picture was dramatically reversed for species associated with agricultural land. The problems are significant across the county but are if anything more severe in the uplands than the lowlands.

In the lowlands only three out twelve species (Barn Owl, Stock Dove and Tree Sparrow) showed any increase while nine are in decline or have become extinct (Grey Partridge, Lapwing, Turtle Dove, Skylark, Meadow Pipit, Yellow Wagtail, Linnet, Corn Bunting and Yellowhammer).

Three out of 16 moorland species (Red Grouse, Golden Plover and Stonechat) appear to have increased in range but those of the remainder decreased, eleven of them significantly (Teal, Dunlin, Redshank, Snipe, Cuckoo, Skylark, Ring Ouzel, Whinchat, Wheatear, Meadow Pipit and Twite).

The reasons for these changes are complex and multi-faceted. Many wetland species have undoubtedly benefitted from the habitat creation efforts of the conservation organisations while the impacts of environmental subsidies for farmers appear to have at best slowed the impacts of agricultural intensification.

It is also clear that, as in the country as a whole, for some species the causes also lie further afield. Of the 20 trans-Saharan migrant species that breed in Lancashire only four have shown any increase in distribution while nine have declined significantly. Climate change may also be beginning to play its part.

Unravelling which of these factors have been most important, and which others have assisted the spread of so many species is a matter that will get further attention for publication in the county bird report.

SUMMARY OF THE WEATHER DURING THE SURVEY PERIOD, 2007-2011

Overview
The atlas recording period coincided with an exceptional run of poor summers and cold winters. This made life very hard for many species and for the many intrepid volunteers carrying out survey work in all weathers.

Winter 2007/08
Temperatures were 1 to 1.5 °C above average during the winter. January was particularly wet with double the average rainfall. In contrast February was exceptionally sunny and this resulted in it being the sunniest winter since 2001.

Spring 2008
March and April both had close to average temperatures with significant rainfall. May was the warmest and second driest for a hundred years (only May 1991 was drier). Despite the early rain all three spring months had above average sunshine.

Summer 2008
The maximum temperatures were the same as August 2007, which had been the coolest since 1994. All three summer months had above-average rainfall, with August being the wettest month. Summer sunshine levels were below average across the county and exceptionally so in August.

Autumn 2008
It was the coldest autumn since 1993. A very cold end to the month resulted in the coldest October temperature since 1960. A month later November had its coldest temperature since autumn 1993 on the 29th and 30th. Rainfall amounts were high throughout and it was the wettest autumn since 2000. Sunshine durations were below average and it was it was the dullest autumn since 2001.

Winter 2008/09
The temperature for the winter was 0.5 °C below average, making it the coldest winter since 1996/97. A generally cold first half to December was followed by a milder period, before turning very cold by the New Year. This very cold spell persisted for the first ten days of January with some severe frosts, followed by alternating milder and colder periods. The first half of February was cold and snowy with milder conditions later in the month.

The cold weather resulted in lower than average rainfall amounts and February recorded less than 50% of the average. Significant snowfalls occurred in the first half of February, during the first week depths greater than 15cm were recorded quite widely.

Sunshine durations were high throughout December and January, whereas February was rather dull.

Spring 2009
The mean temperatures for the county were higher than average throughout the spring. There was a notable absence of frost, particularly in April. Spring rainfall was below normal and sunshine totals were well above average. March was a particularly sunny month.

Summer 2009
The frequent cloudy conditions in July and August meant that temperatures tended to be lower than normal by day and night. Sunshine totals were correspondingly poor with only June being close to average.

Summer rainfall was above normal, but the three months had contrasting patterns. June was drier than normal in most areas, July was the wettest this century and August was not much better. There were 42 days with rain over the summer, very similar to the rain-days in summers 2008 and 2007. In terms of rainfall amount, the summers 2007 to 2009 combined were the wettest consecutive three for a century.

Autumn 2009
Autumn overall was wetter and warmer than normal and there was a notable absence of frost in November. The three months had contrasting rainfall patterns. September was very dry receiving only half the normal rainfall, October was also drier than normal but in November rainfall was well above average. Sunshine totals for the autumn were close to average with September being sunniest. October and November were generally rather dull.

Winter 2009/10
The average temperature for the winter was 2.0 °C below average, making it the coldest winter since 1978/79. In fact, only winter 1962/63 was significantly colder in the last hundred years. There was also a particularly high number of frosts.

A generally mild first ten days in December were followed by a colder period which persisted for the first half of January with some severe frosts. After mid-month, temperatures rose to around normal before a return to colder conditions. These persisted for most of February, with only a few brief milder interludes.

Significant snowfalls occurred widely at times from mid-December until the end of February. These included falls of over 20cm in early January. Rainfall totals were less than 50% of normal in each month.

Sunshine duration was above average in December and January whilst that in February was close to normal. Coastal areas of the county had over a third more sunshine than usual.

Spring 2010
Spring rainfall was low and it was especially dry with less than 60% of average rainfall, resulting in the driest spring since 1984. As a result sunshine totals were well above average with April being a particularly sunny month.

Summer 2010
The frequent cloudy conditions experienced in July and August meant that temperatures were lower than normal by day and night and August was the coolest since 1993. Summer rainfall was 7% above normal, but again the three months had very contrasting patterns.

June was drier than normal in most areas, with less than 50% of average rainfall, July was much wetter than normal (although not compared with the rest of the Atlas period!) and August followed a similar pattern. The wet weather was not confined to Lancashire with high rainfall in a broad swathe from East Anglia to South Wales, throughout north-west England and much of northern Scotland.

June was the sunniest month. July was duller than average and sunshine was again below normal in August.

Autumn 2010
Temperatures in September and October were near normal but a very cold last week in November made it the coldest November since 1993.

Rainfall was high in September, below average during October and normal in November. September sunshine totals were normal despite the wet weather and both October and November recorded above average sunshine.

Winter 2010/11
The mean temperature for the winter as a whole was 2.4 °C, making it less cold than winter 2009/10 but still the second-coldest winter since 1985/86. December was exceptionally cold, with the highest number of air frosts in at least the last 50 years. It was also the coldest calendar month since February 1986. Chilly conditions persisted in early January, before a milder spell around mid-month then a return to colder weather. Temperatures were actually above average in February, making it the mildest February since 2002.

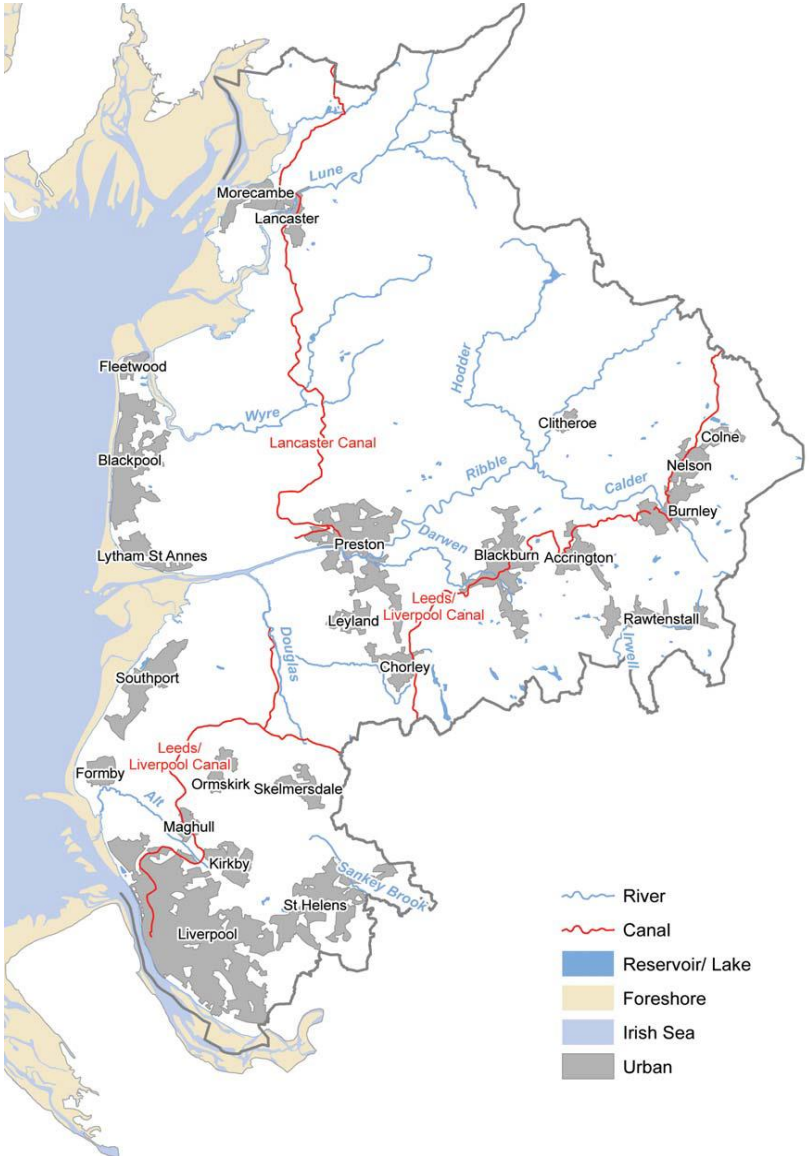
Precipitation amounts were well below average during both December and January but above in February. In December, there were widespread snowfalls in the first week and from mid-month until Christmas. It was the driest December since 1963 and the third driest in a hundred years. In contrast February was particularly wet. Sunshine durations were well above average during December and January. However, February was relatively dull.

Spring 2011
Temperatures for the spring were 1.4 °C above average. It was the warmest spring of the century and April was very warm. Spring rainfall was well below normal and the lowest since 1990. Sunshine totals were 20% above normal and April was a particularly sunny month.

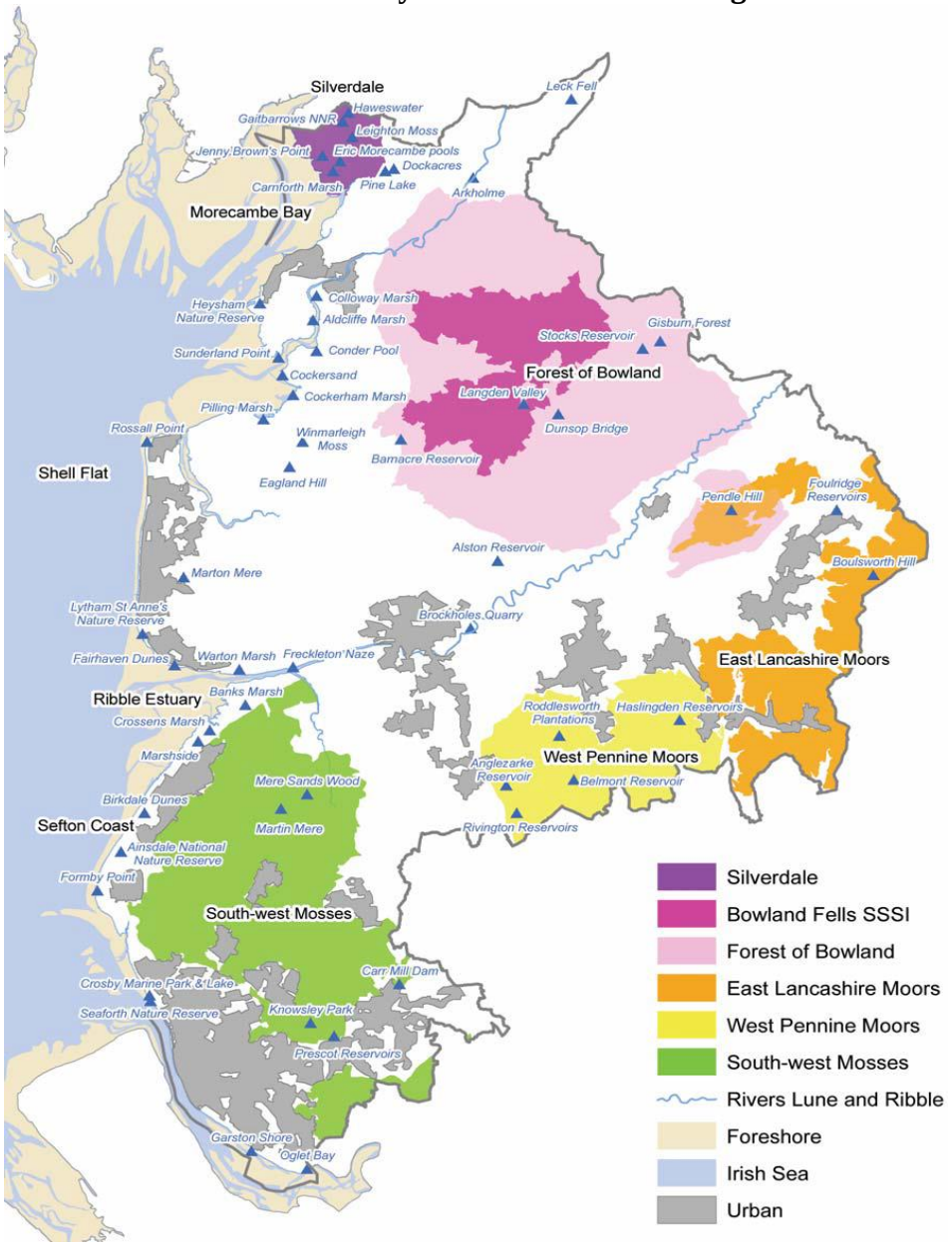
Summer 2011
The breeding atlas period continued to be beset by poor weather with summer temperatures 0.7 °C below average. It was the coolest June across the UK since 2001, the coolest July since 2000 and the coolest August since 1993. Overall the season was the coolest since summer 1993. There were only around ten days when the temperature widely exceeded 25 °C.

Summer rainfall was 11% above normal and generally wetter than summer 2010, but not as wet as summers 2007 to 2009. Sunshine totals over the UK were close to average, and similar to summer 2010.

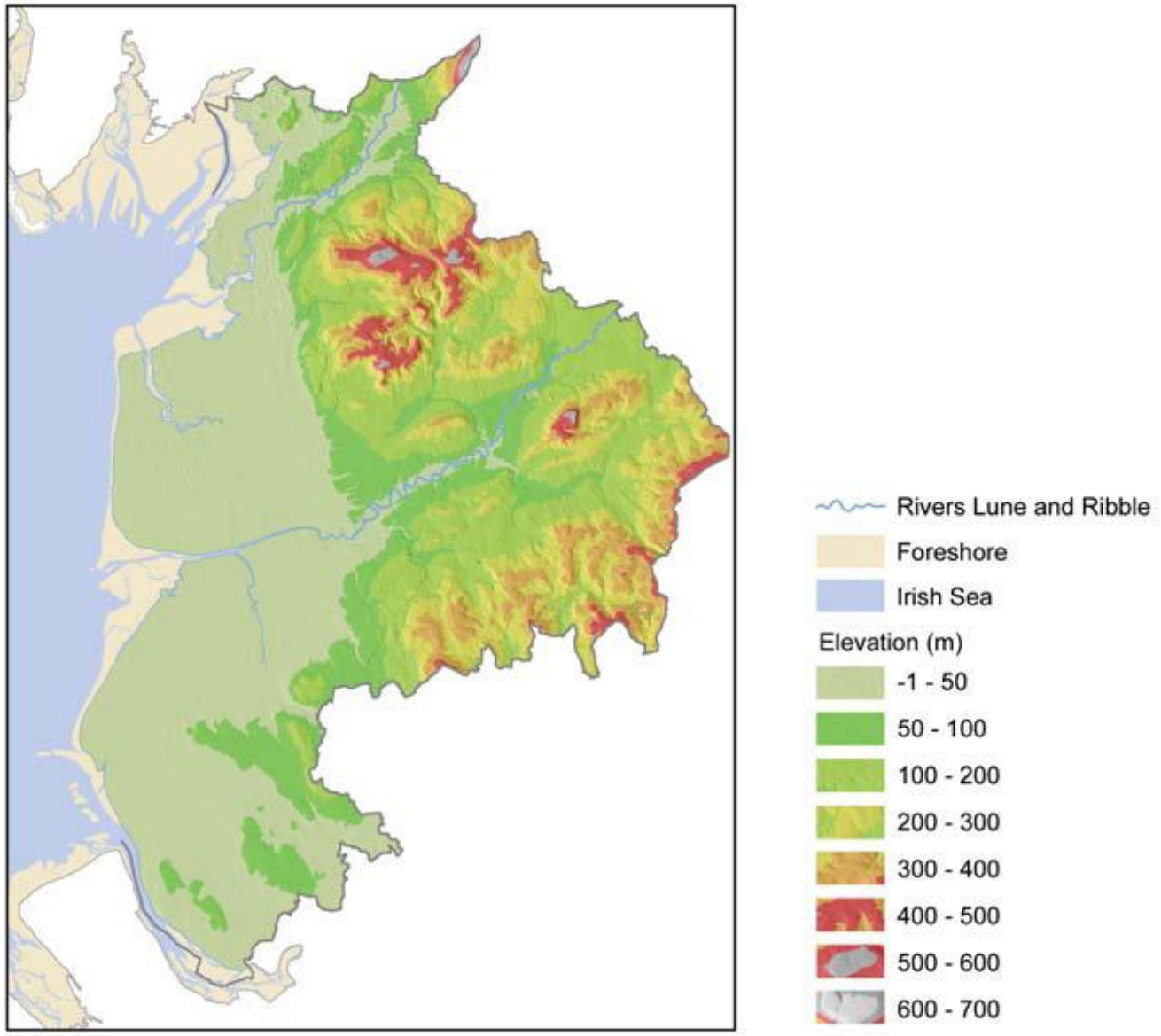
Lancashire and North Merseyside: major towns and rivers



Lancashire and North Merseyside: main birdwatching sites



Lancashire and North Merseyside: height above sea level



Lancashire and North Merseyside: agricultural land use