

## Whinchat work in the UK 2016 to 2017

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BORDER J 2017: Whinchat work in the UK 2016 to 2017. WhinCHAT 1, 91-95.

This brief report gives you a review of the Whinchat work of me and some selected researchers in the UK in 2016 to 2017.

### Jennifer Border (previously Jennifer Taylor)

Over the last year I have been working for the BTO with Ian Henderson on a collaboration with the RSPB to attach geolocators to Whinchats. We attached 20 geolocators to adult male Whinchats last breeding season (2016), this year we are hoping to re-catch some of these males to retrieve the tags.

I have also been busy writing up my PhD papers. I have 2 Whinchat papers out since November (there are 2 more to come sometime in the future).

### Paper summaries:

**Border JA, Henderson IG, Redhead JW, Hartley IR 2016: Habitat selection by breeding Whinchats *Saxicola rubetra* at territory and landscape scales. Ibis. doi: 10.1111/ibi.12433.**

Or see this blog post about the paper: <https://www.bou.org.uk/border-whinchat-habitat/>

**Abstract:** In order to efficiently focus conservation action we need to identify strongholds of habitat that still exist. Habitat preferences and areas of suitable habitat can be determined from fine-scale habitat sampling and corresponding surveys of species abundance. However, this method is too expensive and time consuming to conduct over extensive areas or in very remote locations. If we can use freely available large scale data to model species distributions there is a potential to cover a much larger area for a fraction of the cost and time. In order to explore the pros and cons of landscape scale data in more detail, we investigated habitat selection in breeding Whinchats, *Saxicola rubetra*. We aimed to determine which habitat features were most strongly associated with Whinchat occurrence at each scale and to explore the consistency in pre-

ferences at the two scales. In general the same habitat characteristics were important at both spatial scales, however, due to the differences in how the data was measured and extrapolated, some responses differed for territory and landscape scales. This suggests that though landscape scale modelling can guide conservation action towards suitable regions, fine-scale measurements will still be needed to form reliable detailed management plans.

**Border JA, Henderson IG, Hartley IR 2017: Characterising demographic contributions to observed population change in a declining migrant bird. J Avian Biol. Accepted Author Manuscript. doi:10.1111/jav.01305**

**Abstract:** Populations of Afro-Palearctic migrant birds have shown severe declines in recent decades. To identify the causes of these declines, accurate measures of both demographic rates (seasonal productivity, apparent survival, immigration) and environmental parameters will allow conservation and research actions to be targeted effectively. We used detailed observations of marked breeding birds from a 'stronghold' population of Whinchats *Saxicola rubetra* in England (stable against the declining European trend) to reveal both on-site and external mechanisms that contribute to population change. From field data, a population model was developed based on demographic rates from 2011 to 2014. Observed population trends were compared to the predicted population trends to assess model accuracy and the influence of outside factors, such as immigration. The sensitivity of the projected population growth rate to relative change in each demographic rate was also explored. Against expectations of high productivity, we identified low seasonal breeding success due to nocturnal predation and low apparent first-year survival, which led to a projected population growth rate of 0.818, indicating a declining trend. However, this trend was not reflected in the census counts,



Fig. 1: Male Whinchat tagged with a geolocator in Salisbury Plain (Photo: © J. BORDER).

suggesting that high immigration was probably responsible for buffering against this decline. Elasticity analysis indicated was most sensitive to changes in adult survival but with covariance between demographic rates accounted for, was most sensitive to changes in productivity. Our study demonstrates that high quality breeding habitat can buffer against population decline but high immigration and low productivity will expose even such stronghold populations to potential decline or abandonment if either factor is unsustainable. First-year survival also appeared low, however this result is potentially confounded by high natal dispersal. First-year survival and/or dispersal remains a significant knowledge gap that potentially undermines local solutions aimed at counteracting low productivity.

#### **Other articles:**

A 2 page article in the Sanctuary military magazine (p64-65, available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/576010/sanctuary\\_45\\_2016\\_reduced.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/576010/sanctuary_45_2016_reduced.pdf) )

And there will be an article appearing in Wiltshire

ornithological society annual report.

#### **Will Cresswell**

Will Cresswell currently has a paper on Whinchat connectivity in review. His team have published the following papers on Whinchats over the last couple of years:

**Blackburn E, Burgess M, Freeman B, Risely A, Izang A, Ivande S, Hewson C, Cresswell W 2016: An experimental evaluation of the effects of geolocator design and attachment method on between-year survival on whinchats *Saxicola rubetra*. *Journal of Avian Biology* 47, 530-539.**

**Abstract:** Data from location logging tags have revolutionised our understanding of migration ecology, but methods of tagging that do not compromise survival need to be identified. We compared resighting rates for 156 geolocator-tagged and 316 colour ringed-only Whinchats on their African wintering grounds after migration to and from eastern Europe in two separate years. We experimentally varied both light stalk length (0,5 and 10 mm) and harness material (elastic or non-elastic nylon braid tied on, leg-loop 'Rappolle' harnesses) in the second year using a reason-

nably balanced design (all tags in the first year used an elastic harness and 10 mm light stalk). Tags weighed 0.63 g (0.01 SE), representing 4.1% of average body mass. There was no overall significant reduction in between-year resighting rate (our proxy for survival) comparing tagged and untagged birds in either year. When comparing within tagged birds, however, using a tied harness significantly reduced resighting rate by 53% on average compared to using an elastic harness (in all models), but stalk length effects were not statistically significant in any model considered. There was no strong evidence that the fit (relative tightness) or added tag mass affected survival, although tied tags were fitted more tightly later in the study, and birds fitted with tied tags later may have had lower survival. Overall, on a precautionary principle, deploying tags with non-elastic tied harnesses should be avoided because the necessary fit, so as not to reduce survival, is time-consuming to achieve and does not necessarily improve with experience. Geolocator tags of the recommended percentage of body mass fitted with elastic leg-loop harnesses and with short light stalks can be used without survival effects in small long-distance migrant birds.

**Blackburn E, Cresswell W 2016: High within-winter and annual survival rates in a declining Afro-Palaeartic migratory bird suggest that wintering conditions do not limit populations. *Ibis* 158, 92-105.**

Abstract: For migratory birds, it is necessary to estimate annual and overwinter survival rates, identify factors that influence survival, and assess whether survival varies with age and sex if we are to understand population dynamics and thus inform conservation. This study is one of the first to document overwinter and annual survival from the wintering grounds of a declining Afro-Palaeartic migrant bird, the Whinchat *Saxicola rubetra*. We monitored a population of marked individuals for which dispersal was low and detectability was high, allowing accurate estimates of survival. Annual survival was at least 52% and did not differ significantly across demographic groups or with habitat characteristics or residency time in the previous winter. Overwinter survival was very high and monthly survival at least 98% at some sites. Although winter residency varied spatially and with age, lower residency did not correlate with reduced annual survival, suggesting occupancy of multiple wintering sites

rather than higher winter mortality of individuals with shorter residency. Our results suggest that mortality occurs primarily outside the wintering period, probably during migration, and that wintering conditions have minimal influence on survival. The similarity between survival rates for all age and sex classes when measured on the wintering grounds implies that any difference in survival with age or sex occurs only during the first migration or during the post-fledging stage, and that selection of wintering habitat, or territory quality, makes little difference to survival in Whinchats. Our findings suggest that the wintering grounds do not limit populations as much as the migratory and breeding stages, with implications for the conservation of declining Afro-Palaeartic migrants more widely.

**Blackburn E, Cresswell W 2015. High winter site fidelity in a long-distance migrant: implications for wintering ecology and survival estimates. *J. Ornithol.* 157, 93-108.**

Abstract: The decision for a migratory animal to be site faithful in its non-breeding season has profound implications for migratory connectivity, resilience to winter habitat loss and population dynamics through carry-over effects on future breeding success and fitness. Knowledge of the temporal and spatial scale of site fidelity and dispersal is also central to accurate survival estimates. We established the observed spatial and temporal scale of site fidelity and the ability to detect small-scale dispersal within and between years for a wintering long-distance Palearctic migrant, the Whinchat *Saxicola rubetra*, by comparing predicted and observed detection rates within the study site. Across two years, 54% of birds returned to the study site and all returning birds reoccupied the territories they used in the previous winter. Observed dispersal was very low despite the high probability of detecting any local dispersal, suggesting that return rates are indicative of true between-winter survival rates for this population. In any winter, 50% of returning individuals had a previously occupied but now empty territory that was less than one territory-span away from the centre of their current territory; high site fidelity was therefore very unlikely to be because of limited territory availability. Over-winter residency time (defined by departure month) differed significantly across sites and with age, but did not determine the probability of whether a bird returned in the fol-

lowing year. This suggests the use of more than one wintering site for some individuals, rather than reduced over-winter survival. This study is one of the first to comprehensively document site fidelity at the territory scale in a Palearctic system, although less comprehensive studies or anecdotal evidence suggest that high winter site fidelity may be relatively common. Here we provide evidence for the serial residency hypothesis, where selection acts for individual migrants to have generalist habitat requirements, allowing them to survive in and remain site faithful to even relatively low quality, but sufficient and familiar sites. Lower dispersal and higher site fidelity compared to that during breeding suggest that annual survival estimates are more accurate when measured on the wintering grounds. This study supports previous findings that wintering conditions do not limit Whinchat populations.

#### David Douglas

In 2016 RSPB commenced a major new research project to better understand the causes of Whinchat declines across the UK. Populations in the UK have declined by 54% between 1995 and 2013, and whilst the loss of extensively managed grassland is likely to have contributed to declines in lowlands, there is also evidence of widespread declines across the upland range. If these upland areas no longer support stable populations there is an urgent need to identify why this is the case and design conservation management. This project uses field data collection and analysis to examine the extent to which variation in the quality of upland breeding habitat has driven declines, and inform the design of trial management interventions. The project is scheduled to run until 2019. The aim of fieldwork in 2016 was to identify whether habitat characteristics such as field layer vegetation are associated with the location of Whinchat territories, working from southwest England to the Scottish Highlands. Future work will examine the extent to which changes in Whinchat abundance over time are associated with differing habitat quality.

#### Malcolm Burgess

Other Whinchat work the RSPB is involved in including the Retrapping adults for survival scheme at Geltsdale (which is discussed more in a separate article here by Stephen Westerberg) and attaching geolocators to Whinchats in collaboration with the BTO.

The RSPB tagged 19 adults at Geltsdale and 2 at Dartmoor in 2016. In 2017 they aim to retrieve the tags and tag 35 more on Ex-moor; this work is fully funded and will employ Judit Mateos on Exmoor to do this (Judit is about to start a PhD with Will Cresswell on Whinchats in Africa). Lastly the RSPB are involved in a PhD at Exeter undertaken by Sara Zonneveld. She has four study species and some quite varied analyses. Whinchats features in two of these analyses. One looks at timing of moorland management (burning and bracken bruising) in relation to timing of breeding and shows conflict between management timing (bracken bruising only for Whinchat) and breeding timing. Another looks at microclimate of nests using a solar index but this has not so far found very much of interest.

**Christopher Murray, Jeroen Minderman, James Allison, John Calladine**

They published:

**Murray C, Minderman J, Allison J, Calladine J 2016: Vegetation structure influences foraging decisions in a declining grassland bird: the importance of fine-scale habitat and grazing regime. *Bird Study*, 1-10.**

Abstract: Whinchat *Saxicola rubetra* foraging behaviour was significantly influenced by habitat structure and grazing.

Aims: To assess how foraging habitats selected by breeding Whinchats differed from wider territory attributes under contrasting grazing management in multiple upland areas in Scotland: principally sheep grazed, Red Deer grazed or ungrazed, and to identify how differing land use may limit suitable foraging areas.

Methods: We compared fine-scale vegetation structure in patches chosen for foraging by Whinchats in contrasting grazing management regimes.

Results: Whinchats were less likely to forage in patches with a greater cover of bracken and tall non-bracken vegetation, regardless of grazing regime. Grass cover influenced foraging behaviour in ungrazed habitats only, where Whinchats were less likely to forage in areas with high grass cover.

Conclusion: Whinchats appear to require a mosaic or range of sward structures within breeding territories, highlighting the importance of establishing how vegetation structure influences breeding

ding birds at different spatial scales. Our results suggest that suitable foraging patches were plentiful within grazed habitats but potentially limited in ungrazed habitats. Further work is needed to identify management regimes and interventions to maintain conditions suitable for breeding

Whinchats that are compatible with other land use and conservation objectives.

**Stephen Westerberg, Leo Smith**

See separate papers in this magazine.

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