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Age of first breeding in the Thrush Nightingale *Luscinia luscinia* – a comment of the information given in BWP

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Introduction

The purpose with this contribution is to comment on the information in Cramp (1988) and Glutz & Bauer (1988) regarding the age at which the Thrush Nightingale *Luscinia luscinia* starts to breed. The information in Cramp (1988) is that "some males breed at one year of age, females and most males later. (J. Sorjonen)". Glutz & Bauer (1988) seem to be more careful and write that possibly at least in the northern part of the range a smaller proportion of the birds than in the Nightingale *Luscinia megarhynchos* breeds in the first year. They refer to Sorjonen (1977), who studied a population in southeastern Finland. Sorjonen found that only 11 of 53 ringed breeding birds were one year old (euring code 6) and that most of the birds that did not breed were young birds. For a small passerine 21% first year breeders is a surprisingly low ratio. But Sorjonen also reported about a more likely ratio in a small sample from southwestern Finland where 6 of 11 breeding birds were one year old. Obviously, the statement in Cramp (1988) is not a correct interpretation of Sorjonen (1977). But we also suspect that Sorjonen could have made a mistake when ageing his birds, and if not, his population must be rather aberrant. A comparison with a study of the sibling species the Nightingale (Grüll (1981) and Grill in Glutz & Bauer (1988)) makes the figures for the age composition in Sorjonen (1977) seem even more confusing. We provide some new data from southwestern

Sweden. Our comment mainly concerns males since we only have data for that sex at the moment.

Methods

We are conducting a study of the breeding biology of the Thrush Nightingale near the town of Varberg on the Swedish west coast (about 80 km south of Gothenburg) since 1995. Our study population is stable at about 15 pairs each year. We are trying to catch and ring as many as possible of the singing males. When catching them we use a tape recorder with playback song and a mist net. We try to catch the males before the females arrive since after pair formation it becomes much harder. Not every male has been caught each year since some of them seem indifferent to our catching method.

We cannot, however, completely exclude that the age ratio among those that we have caught is different from the ratio among those that we have not caught, but we have no reason to consider this to be the case.

We aged the birds according to the criteria described in Svensson (1992) and Jenni & Winkler (1994). The most reliable age criterion is the existence of a moult limit among the secondary greater coverts in the young birds. But since the slight difference in abrasion between the two age categories even applies to the greater secondary coverts the difference between juvenile and adult coverts can be hard to tell apart. When handling single birds, bad light conditions might be a problem, and artificial light is not the best way to see this moult contrast. To see the moult limit one must at times use a magnifier (pocket-lens) to be absolutely certain of the age of an individual bird.

The plumage of the young birds can apparently withstand abrasion very well compared to most other young passerines with a similar moult strategy. This is especially true for the retained juvenile

remiges, rectrices and wing coverts that are left after the partial moult. This means that when the birds arrive to their breeding grounds the difference in abrasion of the plumage, and especially the primaries, is surprisingly slight between young and old birds. The same apparently applies for the sibling species the Nightingale (see Jenni & Winkler (1994) for colour photographs).

Since the old birds have a complete moult there is no moult limit. All the coverts are of the same generation. The young birds only moult a few secondary greater coverts (normally less than half of them) and therefore a moult limit exists (two generations of coverts). The young birds can mostly be picked out during the autumn when the juvenile secondary greater coverts are pale tipped compared to the newly inner moulted ones which are uniform. Occasionally, the pale tips may not be as distinct as described. During the spring there are often only traces left of these pale tips and sometimes they are worn off completely and the difference between juvenile and adult type coverts becomes much harder to see. If a bird is aged incorrectly, the most likely error is that a young bird would be aged as an old one. The other way around is most unlikely.

It is important to understand that the ageing methods for the two European Nightingale species are the same. One of us (RA) has a thorough experience of ageing passerines in general and has handled thousands of birds.

We have also checked the original references to see if there could have been any misinterpretations of the sources that have led to the information given in Cramp (1988) and Glutz & Bauer (1988). Biological Records between 1980–1997 (and even part of 1998) and Zoological Records between 1978–1997 (and even part of 1998) have also been checked.

Results

We have caught and ringed 22 males between 1995 and 1998 in our study population. During the 1995 season eight males were ringed but not aged properly since we experienced difficulties with the observed plumage details (often depending on bad light conditions) and the conflicting information about age at first breeding. It was first during the 1996 season (and partly helped by the information in Jenni & Winkler (1994) about the Nightingale) that we realised that the information in Cramp (1988) and Glutz & Bauer (1988) apparently was not applicable to our study population. Fourteen males have been caught between 1996 and 1998 and properly aged.

All these fourteen males bred and could be connected with a specific nest or female. Eight birds were one year old (euring code 5). Five birds were at least two years or older (euring code 6). One bird could not be aged properly due to lack of sufficient light at the time and was classified as at least one year old (euring code 4). This means that 62% (8 out of 13 birds) were young males, which is a much higher proportion than the 21% (11 out of 53 birds) reported by Sorjonen (1977) from southeastern Finland (unclear if he referred to males or both sexes combined, but it is likely that most of them were males).

We have not succeeded in tracing the source of the information given in Cramp (1988). But since Sorjonen was mentioned the source is probably Sorjonen (1977) and if so it seems that he has been in part wrongly cited. He did not explicitly mention if the birds were actually breeding or not. He only told that the birds were caught and aged in a breeding area (at Parikkala, SE Finland in 1971–73) during the breeding season. Sorjonen (1977) also had information from southwestern Finland. That study gave details of eleven birds (caught at Vihti and Tammisaari in 1972). Six of them were young birds. But he did not tell if the birds were actually breeding or which sex they belonged to either. Sorjonen (1977) posed the interpretation that old birds predominate in the old breeding range (SE Finland) compared with the new breeding range (SW Finland).

The literature after the publication of Cramp (1998) and Glutz & Bauer (1988), up to at least 1997, has not come up with anything new regarding the issue in question.

Discussion

Apparently there is an inconsistency between the result of our study and the information given in the standard handbooks. Our study population is not a marginal population with a lot of unpaired young singing males. Instead all birds seem to be paired and at least try to make a breeding attempt. The Thrush Nightingale has bred in the area for decades. Hence we believe that the age ratio that we have observed is typical for a normal population which is stable.

At which age a male starts to breed depends on mainly two things, physical and physiological maturity and its ability to compete successfully with older birds about territories and females. The age ratio may vary from year to year, and how large proportion of birds that breeds in a specific age category can only be estimated if a population is followed over several years. The birds should also be individ-

ually marked, preferably with colour rings, so that the breeding status of each individual can be ascertained.

A key question is how to age a bird correctly. If this cannot be done properly one will not be able to compare different populations, similar species or to determine the normal proportion of a specific age category or its variability. Even in a normal and stable population there will always be birds that do not breed.

Many of the fourteen birds that we aged used the same territories in consecutive years (or at least a ringed bird was seen in the same territory next year) and a ringed nestling returned in the following year and bred (this bird is not included in the fourteen). This indicates that males can show site fidelity. The nestling that returned definitively proves that a male can be mature enough to breed at the age of one year.

We offer two possible explanations to the difference between our result and that of Sorjonen (1977). The first explanation is the difficulties when ageing single birds in the hand. Sorjonen may have aged his birds erroneously, but he did not describe how he aged them. The problem is true even for the close relative, the Nightingale. The absence of birds not properly aged in the cited papers bother us. The authors seem to have been able to age every single bird. This is in our view highly unlikely. For instance, Svensson (1992) states for one year old birds: "many second calendar year birds can be recognised.....". The importance of understanding moult and abrasion when ageing birds has practically exploded during the last decade. The collection of moult data has also increased very much recently and with this a better understanding has been achieved. All of this has contributed to a safer foundation when ageing single birds in the hand. The cited works were conducted nearly two decades ago.

Another thing that is misleading is the fact that both Sorjonen's (1977) and even our own figures are samples taken over three years. This does not tell the real situation each year. In Sorjonen's population there must have been birds that returned the next year and then as adult birds. This means that the real age ratio among Sorjonen's birds must, if they were aged correctly, have been even more in favour of old birds.

The second explanation is that the Thrush Nightingale has spread west and north in Finland during the last two to three decades. Compare with the statement given by Sorjonen (1977), described above, about old and new breeding ranges in Finland. The studies made, especially during the seventies, could

have been dealing with marginal or abnormal populations. The Finnish population was about 200 pairs during the early fifties (Merikallio (1958) cited in Cramp (1988) and Glutz & Bauer (1988)) and increased incredibly to around 8000 pairs during the early eighties (Hildén & Koskimies (1984) cited in Cramp (1988)). When Sorjonen (1977) interpreted his figures, from the study area in southeastern Finland, we think he assumed that it was an old population that behaved as a stable one. But its more likely that his study population was abnormal rather than stable. The Finnish Thrush Nightingale population must have behaved in a way that cannot be considered normal when it managed to increase and expand so much and so fast in such a relatively short period of time. Then the information about the age of the breeding and non-breeding birds could have been interpreted in a way that was wrong or at least misleading.

The sibling species the Nightingale ought to be a good indicator also for when the Thrush Nightingale starts to breed. The information in Cramp (1988) and Glutz & Bauer (1988) seems at first as confusing as in the case of the Thrush Nightingale. Cramp (1988) says: "at least some birds breed at one year (Grüll 1981)".

Alfred Grüll, who was the editor or/and author for the whole section about the Nightingale in Glutz & Bauer (1988), stated that in a breeding population in eastern Austria (apparently his own study area (Grüll 1981)) about 50% of the birds were one year old (no differences between the sexes). All young females bred and out of 13 one year old males, 12 were territorial and of these 7 managed to breed. There is no reference for the females but the information about the males is mentioned in Grüll (1981).

We first thought that this different information was confusing. After scrutinising Grüll (1981) our view is that the information in Glutz & Bauer (1988) seems reliable. Grüll (1981) gives figures for each year and this information is very important. Figures calculated by us using his information for each season gives about the breeding males: approximately 55% old and 45% young males per season on average. The conclusion, mainly based on Grüll in Glutz & Bauer (1988), must be that the young Nightingales regularly breed at the age of one year.

We do not know the ability of Sorjonen or Grüll to age the different species they were dealing with. But since Grüll's figures are more like those for other small passerines we have no reason to doubt that they are correct. If Sorjonen aged his birds correct his study population must have been very special if

not abnormal and absolutely not representative for the Thrush Nightingale.

We cannot find a reason why there should be a difference in age of first breeding between the two sibling species of Nightingales. They have a lot in common with each other, e.g. plumage, breeding biology, moult, singing behaviour and long distance migration. But they are after all two distinct species so the suggestion may be treated with care.

Apparently has nothing new come up in the literature recently that could have spread some light on this special issue. The conclusion we then make is that the Thrush Nightingale males most probably breeds at the age of one year and assume that the same applies for females. They do it at least to the same extent as many other small passerines which are labelled as species breeding at the age of one year. The information in Cramp (1988) about the Thrush Nightingale is at least misleading and in our opinion ought to be revised.

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Sammanfattning

Ålder vid första häckning hos näktergal Luscinia luscinia — en kommentar till uppgifter i BWP

Syftet är att kommentera Cramp (1988) och Glutz & Bauer (1988) om vid vilken ålder näktergalen börjar häcka. Cramp (1988) uppger: ”some males breed at one year of age, females and most males later. (J. Sorjonen)”. Glutz & Bauer (1988) är mer försiktiga: I åtminstone den norra delen av utbredningsområdet häckar möjligen en mindre andel av fåglarna än hos sydnäktergal *Luscinia megarhynchos* som 2K. De hänvisar till Sorjonen (1977), som studerade en population i Finland. Han fann att 21% av de häckande fåglarna var 2K. För en småfågel är detta en låg siffra. Tydligt är uppgiften i Cramp (1988) inte en korrekt tolkning av Sorjonen (1977). Vi misstänker att Sorjonen kan ha åldersbestämt en del fåglar fel och om inte så var hans population tämligen avvikande. En jämförelse med en studie av sydnäktergalen (Grüll (1981) och Grüll i Glutz & Bauer (1988)) gör Sorjonens siffror ändå mer avvikande.

Vi studerar näktergalar nära Varberg sedan 1995. Vår population är stabil på ca 15 par per år. Vi har vid åldersbestämning använt Svensson (1992) och Jenni & Winkler (1994). Det är viktigt att inse att samma kriterier gäller vid åldersbestämning hos båda de europeiska näktergalararterna.

Vi har kontrollerat de ursprungliga referenserna och senare litteratur för att se om feltolkningar kan ha lett till uppgifterna i Cramp (1988) och Glutz & Bauer (1988). Vi har märkt 22 hannar mellan 1995 och 1998. Under säsongen 1995 åldersbestämde vi inte åtta hannar beroende bl.a. på de motstridiga uppgifterna om andelen 2K-häckare i litteraturen.

Fjorton hannar har fångats mellan 1996 och 1998 och åldersbestämts ordentligt. Alla kunde kopplas till ett specifikt bo eller hona. Av dessa var 62% 2K hannar, vilket är en mycket större andel än 21% som Sorjonen (1977) rapporterade från sydöstra Finland.

Vi har inte lyckats spåra källan till informationen i Cramp (1988). Men Sorjonen omnämns så källan måste vara Sorjonen (1977). Det verkar som om han delvis blivit felciterad. Sorjonen (1977) tolkade sin studie som att gamla fåglar dominerade i det gamla häckningsområdet (SÖ Finland) jämfört med det nya häckningsområdet (SV Finland).

Det är tydligt en inkonsekvens mellan våra resultat och de ”stora handböckerna”. Näktergalen har häckat i vårt område i decennier. Följaktligen tror vi

att åldersfördelningen som vi har observerat är typisk för en normal population.

En nyckelfråga är hur man åldersbestämmer en fågel korrekt. Om detta inte kan göras ordentligt kan man inte jämföra olika populationer eller bestämma andelen av en ålderskategori eller dess variation. Många av de fjorton fåglarna som vi åldersbestämde använde samma revir året efter (en märkt fågel sågs i samma revir) och en märkt bounge återvände året efter och häckade (denna fågel är inte inkluderad bland de fjorton).

Svensson (1992) uppger för åldersbestämning under våren: "many second calendar year birds can be recognised.....". Vikten av att förstå ruggning och slitage vid åldersbestämning har exploderat under det sista decenniet. De citerade studierna utfördes för nästan två decennier sedan.

En sak som är missledande är att Sorjonens (1977) och våra egna siffror har samlats in över tre säsonger. Detta anger inte situationen för varje år. Hos Sorjonens population måste det ha funnits fåglar som återvände året efter och då måste andelen gamla fåglar ha varit ännu större.

Näktergalen har under de sista decennierna spridit sig i Finland. Studier som gjorts kan ha rört onormala eller ostabila populationer. Numerären var omkring 200 par under tidigt 50-tal (Merikallio (1958) och ökade till runt 8000 par i början på 80-talet (Hildén & Koskimies (1984). Den finska population måste ha betett sig på ett sätt som inte kan betraktas som normalt när den expanderade och ökade.

Sydnäktergalen borde vara en bra indikator också för när näktergalen börjar häcka. Efter att ha lusläst Grüll (1981) är vår åsikt att uppgifterna i Glutz & Bauer (1988) verkar pålitliga. Grüll (1981) ger siffror för varje år och detta är mycket viktigt. Siffror, framräknade av oss, för varje säsong ger för de häckande hannarna: 55% 3K+ och 45% 2K per säsong i genomsnitt. Slutsatsen måste bli att sydnäktergalen börjar häcka som 2K. Om Sorjonens åldersbestämning var riktig måste hans population ha varit speciell och inte representativ för näktergalen.

Inget nytt har visat sig i litteraturen och vi drar då slutsatsen att näktergalen mest sannolikt börjar häcka som 2K. Uppgifterna i speciellt Cramp (1988) om näktergalen borde enligt vår åsikt revideras.

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Bird kills on roads: is this mortality factor seriously underestimated?

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Introduction

With a new approach of sampling birds killed by road traffic, I estimate the total annual kill in Sweden to be almost ten million birds. This is almost an order of magnitude higher than a previous estimate and may indicate that the road toll of certain wildlife populations may have been seriously underestimated.

Man is the cause of many kinds of changes of the bird fauna. Farming is one of the most important factors since it transforms the landscape fundamentally, for better or worse, depending on the species. But modern farming is generally detrimental because it so intensively exploits major parts of the landscape. Forestry also affects the bird fauna over large areas but less fundamentally than farming. The spread of toxic chemicals, including pesticides, may affect certain species directly but the main effect is elimination of invertebrates and seeds as food for farmland birds. The effects of acidifying compounds and nutrients are also most often not direct but operate via habitat modifications, but their roles are unclear. Nutrients have in fact had considerable positive effects on bird abundance in both freshwater and marine environments.

But man also kills birds directly, deliberately by hunting or unintentionally when birds collide with windows or power lines or are taken by domestic cats. Another such factor causing mortality is road traffic. One might think that these factors are marginal compared with the habitat transformations. So it is, but they may still be important locally. Cats, for example, have been estimated to kill about ten million birds annually in Sweden (Svensson 1996). Although this is only about 3% of the total mortality, it may heavily affect local populations in towns and villages where there are many cats. And these factors may together, even if each of them has only a marginal effect, substantially reduce total population size.

Based on data collected by counting dead birds along a number of sample roads in different parts of the country, Göransson et al. (1978) estimated the total road kill to be about 500.000 and not more than one million birds. Their data were collected during