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THE ZAMBIAN BARN SWALLOW (*HIRUNDO RUSTICA*) PROJECT

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Introduction

In 2007 Birdlife Netherlands (Vogelbescherming Nederland) established a Barn Swallow project in collaboration with the Birdlife partner in Zambia. 'BirdLife Zambia' (formerly the Zambian Ornithological Society) runs a variety of education, conservation and research projects, many of which have the Important Bird Areas (IBA) programme at their core. There is also a ringing scheme and many volunteers participate in the African Wildfowl Census.

Scientific research is the main strand of the Zambian Barn Swallow Project and an important tool which will contribute to the protection of the Barn Swallow and its habitat in Zambia. The results will hopefully contribute to the identification of an effective, science-based conservation program in Zambia (van den Brink 2008).

BirdLife Zambia works in schools in, or close to, Important Bird Areas and uses Barn Swallows to raise awareness for nature and bird conservation. The Zambian Barn Swallow Project – with a main focus on research – has close links to the IBA Schools Programme. During the period of fieldwork (October 2007 – March 2008) presentations were given at several schools and some participants forged links with Dutch schools through an internet blog.

The Zambian Barn Swallow Project is a joint initiative of the Zambian Ornithological Society / BirdLife Zambia (ZOS) and Vogelbescherming Nederland / BirdLife Netherlands (VBN) and Stichting Hirundo. The project was funded by VBN after a successful appeal to its members in 2006.

The Zambian Barn Swallow Project.

The project was originally planned for only one year, from October 2007 to April 2008, but Stichting Hirundo succeeded in extending it to over four years until February 2011. We used four roost sites to trap the swallows on their wintering grounds in Zambia: near Choma, near Chisamba, near Kabwe and in Kasanka National Park.

Our main goal was to investigate fitness differences between swallows using roosts of various sizes and locations (in prep.). Every evening 15 adult and 15 juvenile birds were taken for measurements but we had difficulty sexing the adult swallows because the outermost tail feathers (T6), which are measured to determine gender, were often broken. Therefore we decided to measure the white tail spot on the outermost tail feather to see if it could be substituted as a sexing method. The tail spots differ in size and length in males and females but there is considerable overlap in the measurements. Nevertheless, we were able to sex a larger proportion of the adult swallows. As a by-product of this project an article about this subject was written and published in Ostrich (Duijns et al. 2011). This mark can also be used by African ringers that are ringing Barn Swallows.

White spot length in the outer tail feather

The data obtained for the above article was collected in the first year of the project. Two students from Wageningen University (WUR), Jacintha van Dijk and Sjoerd Duijns, used this project as a study for their masters degree. We therefore tested whether the length of the white spot on the outer tail feather is sexually dimorphic, and whether it can be used as an additional sexing method for adult Barn Swallows. The white spot length was sexually dimorphic, based on DNA analysis of 101 adult individuals. A 95% accuracy in sex determination could be obtained by classifying individuals with a white spot length < 17.5 mm as females and those with a white spot length > 29.5 mm as males. When applying the three methods (i.e.,



tail fork depth, tail length, white spot length) simultaneously on all captured adult Barn Swallows during the study period, we were able to determine the sex of 338 individuals (45%), compared to 217 individuals (29%) using the current methods of tail fork depth and tail length (Table 2, Duijns et al. 2011).

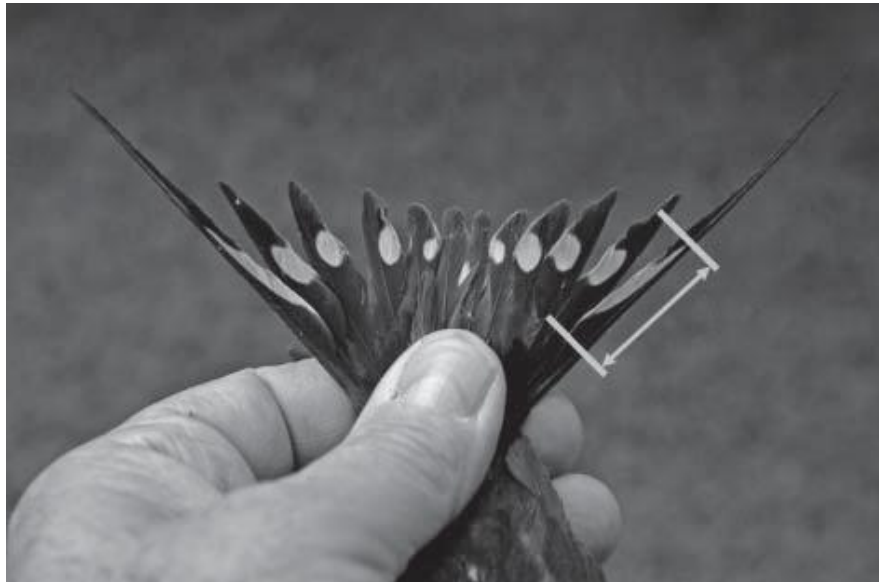


Figure 1. Tail of an adult Barn Swallow. The length of the white spot of the outer tail feather is used to sex adult Barn Swallows. Even when the tip of the outer tail feather is worn or broken as depicted, the white spot can still be measured. (Photo: B. van den Brink)

Table 1: Morphological differences in sexing male and female Barn Swallows (T6= outer tail feather)

	Tail fork	Length T6	Tailspot T6
Male	> 58 mm	>112 mm	> 29,5 mm
Female	< 51 mm	< 93 mm	< 17,5 mm
overlap	52 – 58 mm	93 - 112	17,5 – 29,5 mm

Table 2. Implications of applying the white spot length as an additional method to sexing adult Barn Swallows in the field. The percentages refer to the fraction of birds that could be sexed successfully based on the different morphological variables. Percentages are calculated based on all captured adult individuals during the study period 2007 - 2008 (n = 759).

Combined morphological variables:	%	n
Tail fork and tail length	28.6	217
White spot length and tail fork	43.9	333
White spot length, tail fork and tail length	44.5	338

Site fidelity on wintering grounds

By using the same ringing sites for four years we were able to retrap several migratory birds ringed by ourselves on the very same spot. During the four seasons a good number of ringed swallows were recaptured within the same season and in successive years. 89 Barn Swallows were retrapped in the same season between two and sixty days after ringing. This is an indication that these birds used the same roost for a long period, and possibly for the whole wintering period. Another 68 swallows were recaptured after one to three seasons at the same roost site. These birds show site fidelity to their once chosen wintering area and roost (in prep).

Not only swallows were recaptured, but we also had retraps of other bird species in successive years: Garden Warbler *Sylvia borin*, Common Whitethroat *Sylvia communis*, Sedge Warbler *Acrocephalus schoenobaenus* and European Reed Warbler *Acrocephalus scirpaceus*. These birds were also shown to revisit a chosen wintering area.

Origin of European Barn Swallows in Zambia

Between October 2007 and March 2011 a total number of 26694 birds were ringed, amongst them 22351 Barn Swallows. For details see <http://www.boerenzwaluw.nl/pagina6.html>.



We caught 12 swallows with foreign rings and received two recoveries, thus giving an idea of the origin of the European Swallows wintering in Zambia. The main origins were countries in the eastern part of Europe (Figure 2). On the map a recovery of a Belgian bird is missing because data have yet to be received. Very recently a recovery came from Nishni Novgorod, Russia. Also a recovery from Zambia to Roodepoort S.A. one year after ringing is missing because the map was finished before this data was received.

The Zambian birds are thought to use the eastern flyway through the Middle East to enter Africa and will be part of the huge population of Russian and west-Asian birds.

Between 1970 and 1998 a further 20247 Barn Swallows were ringed at roosts in Zambia and the 76 (!) recoveries of these birds showed the same origin. (Dowsett & Leonard, 2001).

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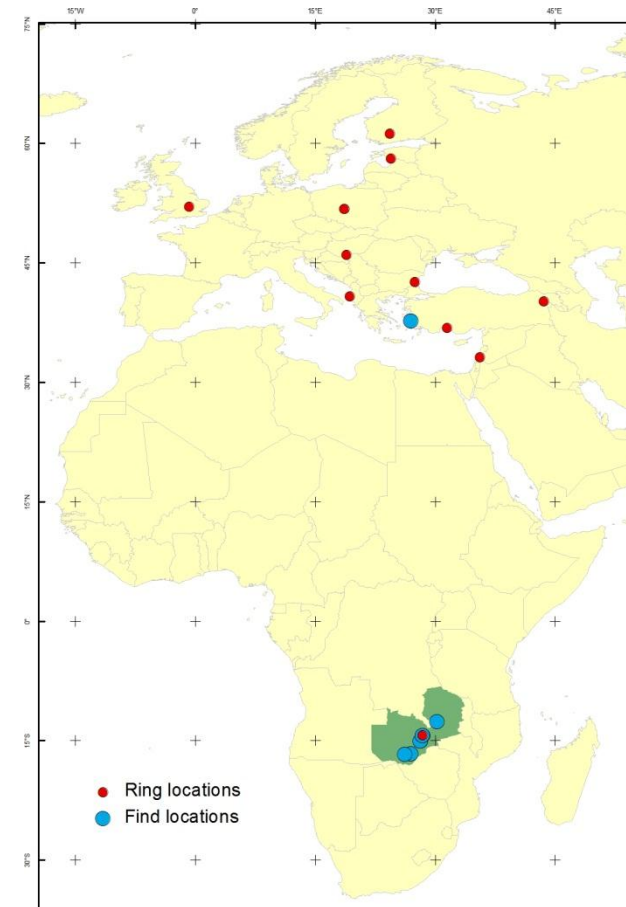


Fig. 2: Recoveries from and to Zambia within the Zambia Barn Swallow Project