Ringing recoveries of house sparrow (*Passer domesticus*) in the Faroe Islands during the years 1963-2007

Ringmerkingar av føroyskum gráspurvum (Passer domesticus) *árini 1963-2007*

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Úrtak

Gráspurvurin (*Passer domesticus*) má metast at vera ein tann støðufastasti búfuglurin í Føroyum. Síðan 1963 eru tilsamans 2.167 gráspurvar ringmerktir í 12 ymiskum føroyskum bygdum, spjaddar kring landið. 17% vórðu merkt í reiðrinum, 39% vóru ungfuglar og 39% vaksnir fuglar. 225 (10%) av teimum merktu gráspurvunum vórðu fingnir ella sæddir aftur; allir í Føroyum, og einans tveir í aðrari bygd enn henni, har teir upprunaliga vórðu merktir. Helvtin av fráboðanunum komu tær fyrstu 8 vikurnar eftir merkingina, 25% fyrstu 3 vikurnar. Í flestum førum (68%) doyðu fuglarnir av ókendum ávum, men har deyðaatvoldin var kend, var ketta vanligasta atvoldin. Miðallívstíðin hjá føroyska gráspurvinum er 1,3 ár. Helvtin av spurvunum, sum vórðu merktir í reiðrinum ella sum ungfuglar, doyðu eftir 4,1 mánaðum. Tann elsti gráspurvurin, vit vita um í Føroyum, varð fingin aftur næstan tíggju ár eftir, at hann varð merktur í reiðrinum.

Abstract

The house sparrow (*Passer domesticus*) is one of the most sedentary species of wild birds in the Faroe Islands. Since 1963, 2,167 house sparrows (17% nestlings, 39% juveniles and 39% adults) have been ringed at 12 places, scattered over the Faroe Islands. 225 (10%) have been recovered, dead or resighted/recaptured, all within the Faroe Islands, and only two outside the villages where they were ringed. Half of the recoveries were reported within 8 weeks, 25% already within 3 weeks. In most cases (68%), the cause of death was unknown. However, "killed by cat" was the most common known cause. The median life-span for the Faroese house sparrows is 4.1 months, and average age at death is 1.3 years. The oldest house sparrow recorded in the Faroe Islands was found dead almost ten years after it was ringed as nestling.

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Introduction

The Faroe Islands were colonized by the house sparrow (*Passer domesticus*) in the late 1930s (Petersen, 1949; Jensen and Kampp, 1997; Bengtson *et al*., 2004). Before that, it was considered a rare vagrant and only recorded once (Andersen, 1901; Salomonsen, 1934). Today it occurs abundantly all over the Faroes and is confined to breed in most build-up areas (Bengtson *et al*., 2004). Even though the house sparrow belongs to the most common sedentary birds in the Faroes, knowledge on its general biology on the islands is sparse. Jensen and Kampp (1997) measured the wingspan of house sparrows from different Faroese villages. They found a considerable geographic variation, which they explained by the existence of local subpopulations, separated from each others. Bengtson *et al.* (2004) described the history of colonisation by the house sparrow and its current status in the Faroes Island. Censuses all potential sparrow-habitats, they estimated the Faroese house sparrow population to be in the order of 2,600 breeding pairs. Additionally, they found that 80% of the 118 settlements in the Faroes Islands were more or less regularly occupied by the house sparrow.

In this paper, we report the results from all ringing studies of the Faroese house sparrow, which have been carried out since 1963. These results give the basis for description of the movements and life-span of the Faroese house sparrow.

Material and methods

The present paper is based on results from ringing studies of Faroese house sparrows. Most of the data have been provided by the Copenhagen Bird Ringing Centre, Zoological Museum, which has been the ringing authority of all studies. The Copenhagen Bird Ringing Centre's guideline for ringing and recovery of birds is available on: http://www.zmuc.dk/VerWeb/ringing/del1.htm.

Adults and juveniles ringed were caught by mist net, Bow net, funnel trap or a Helgoland trap, whereas the pulli were ringed in nestling boxes during their first week of life. The age was determined on a scale from 1-4: 1= Pullus i.e. nestling or chick. 2= Full-grown, age otherwise unknown. 3= First calendar year 4= Older than firs calendar year. The life-span was defined as the time-lapse between the date of ringing and the date when recovered as dead. Only birds ringed as nestlings or juveniles in their first autumn were used for calculation (see Bønløkke *et al*., 2006; Bakken *et al*., 2009).

To get the best possible quality of the date and to be sure that no results have been forgotten or misreported, we have, when possible, been in personal contact with the persons responsible for the different ringing studies.

Results

A total of 2,167 house sparrows have been ringed in the Faroes Islands during the years 1963 to 2007 (Table 1). The ringing studies have been conducted in 12 different places, scattered over most of the islands, from Sumba in the south, Mykines in the west and Viðareiði and Kirkja in the north east (Figure 1). Most of the house sparrows (65%) were ringed in the village Nólsoy where in total 1,417 birds were ringed during the years 1984 to 2007. Age information is available for 95% of the house sparrows ringed. Of these, the great majority (82%) were ringed as juveniles or adults (Table 2). The sex-ratio was almost equal: 29% males and 25% females. 46% of the birds were unsexed.

225 (10%) of the ringed house sparrows

Village	*Year*	*Number ringed*	*Number recovered*
Kirkja	*1987*	***14***	***0***
Viðareiði	*1991*	***18***	*1*
Klaksvík	*1999*	***13***	***0***
Mikladalur	*1963*	*9*	*0*
	1966	*1*	*0*
	1968	*4*	*0*
	1977	*1*	*0*
	1987	*3*	*0*
	Total	***18***	***0***
Vestmanna	*1967*	*22*	*0*
	1968	*3*	*1*
	1969	*14*	*2 (1)*
	1972	*24*	*3*
	1973	*27*	*2*
	Total	***90***	***8 (1)***
Mykines	*2003*	***16***	***0***
Nólsoy	*1984*	*55*	*7*
	1985	*66*	*4*
	1986	*75*	*7*
	1987	*59*	*9*
	1988	*103*	*13*
	1989	*79*	*4*
	1990	*80*	*8*
	1991	*75*	*4*
	1992	*55*	*6*
	1993	*41*	*3*
	1994	*52*	*4*
	1995	*108*	*5*
	1996	*89*	*8*
	1997	*63*	*5*
	1998	*72*	*3 (1)*
	1999	*46*	*3*
Nólsoy (continued)	*2000*	*68*	*1*
	2001	*39*	*0*
	2002	*64*	*3*
	2003	*11*	*0*
	2004	*36*	*1*
	2005	*11*	*0*
	2006	*40*	*1*
	2007	*30*	*1*
	Total	***1,417***	***100 (1)***
Tórshavn	*1968*	*3*	*0*
	1991	*17*	*0*
	1999	*10*	*0*
	2002	*112*	*66*
	2004	*141*	*1*
	Total	***283***	***67***
Hoyvík	*1968*	***12***	***0***
St. Dímun	*1993*	*16*	*0*
	1994	*8*	*0*
	Total	***24***	***0***
Tvøroyri	*1986*	*4*	*0*
	1987	*2*	*0*
	1988	*9*	*0*
	1989	*1*	*0*
	Total	***16***	***0***
Sumba	*1987*	*20*	*0*
	1991	*9*	*1*
	2002	*54*	*9*
	2004	*86*	*25*
	2006	*54*	*14*
	2007	*23*	*0*
	Total	***246***	***52***
Grand total		***2,167***	***225 (2)***

Table 1. Number of ringed and recovered house sparrows in different villages on the Faroe Islands during the years 1963 to 2007. Numbers in parenthesis indicate recoveries outside the village where they were ringed.

were recaptured or recorded again. Of these, 55% were controlled alive, either as resighted or recaught. Half of the recoveries were reported within the first 7.7 weeks after ringed, 25% already after 3.1 weeks. The last 25% were reported later than 53.8 weeks after being ringed (Table 2). However, both the probability and the time of recoveries depend on the age of the bird when ringed (Figure 2 and Table 2): of the birds ringed as full-grown, 36% were recovered but only 8% of those ringed as juveniles in theirs first autumn (Table 2). While half of the house sparrows ringed as juveniles were recovered within the first 3.9 weeks, the median value for those ringed as pulli was 41 weeks (Table 2).

Of the ringed house sparrows, 98 birds were found dead. In most cases (68%), the cause of death was unknown. However, when known, "killed by cat" was the most common reason (Figure 3). The Faroese house sparrow lives for 1.3 years, on average (Figure 4). Thus, the mortality-rate is high in the first period of life. Already after 1.1 month, 25% of those ringed as nestlings or juveniles in their first autumn had died, After 4.1 months, half of them were dead and 14.7 months after, only 25% of the ringed house sparrows were still alive (Figure 4).

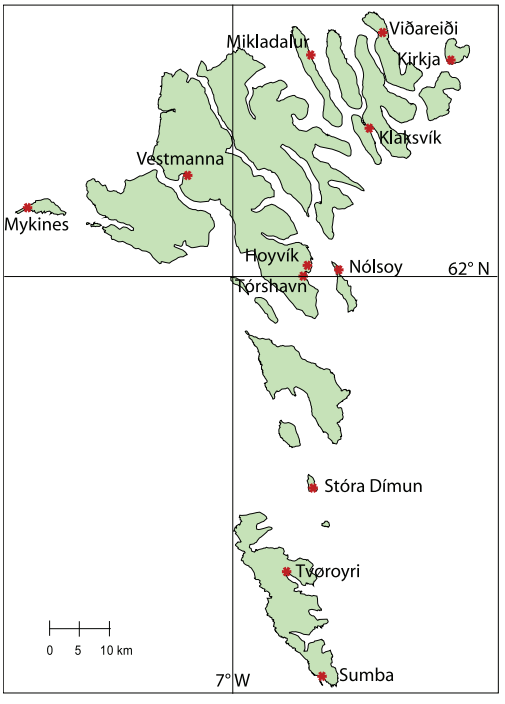

Figure 1. Locations of villages where house sparrows have been ringed in the Faroe Islands during the years 1963-2007.

The oldest house sparrow was found dead on Nólsoy 9.9 years after he was ringed as a nestling on the same place, in June 1987. Remarkably, this bird has also been recorded twice before on Nólsoy: at the first, 7.6 years

Age when ringed	*Number ringed*	*Recovery rate (%)*	*Time between ringing and recoveries (weeks)*			
			Median	*1st quartile*	*3rd quartile*	*Average*
Pulli	*373*	*9.1*	*41.0*	*4.3*	*229.1*	*120.9*
1st calendar year	*845*	*8.3*	*3.9*	*1.7*	*33.5*	*33.9*
After 1st calendar year	*186*	*36.0*	*5.0*	*2.9*	*7.7*	*6.6*
All ages *	*2 167*	*10.4*	*7.7*	*3.1*	*53.8*	*52.0*

** Included in this number are 112 birds of unknown age and 651 full-grown birds but age otherwise unknown.*

Table 2. Ringing and recovery data by age, of house sparrows ringed in the Faroe Islands during the years 1963 to 2007.

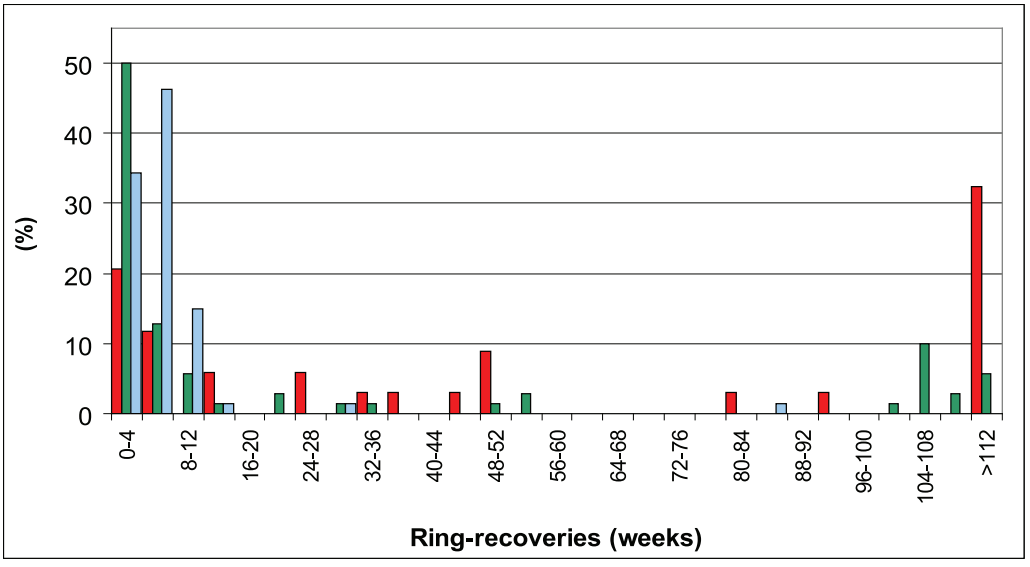

Figure 2. Time between ringing and recoveries of house sparrows ringed in the Faroe Islands as pulli (bars) (n=34), juveniles (bars) (n=70) or adult (bars) (n=67), respectively.

after being ringed and secondly, 9.7 years after being ringed. The second oldest house sparrow was caught in Nólsoy, almost 8.6 years after being ringed as a nestling in the same place in June 1986.

Only two recoveries were made outside the village where they had been ringed. The first one had flown from Vestmanna to Kaldbak, which in a straight line, is a distance of about 20 km. This bird was ringed as full-grown in Vestmanna 217 days earlier, on the 3rd July 1969. The other one had flown about 4.5 km overseas from Nólsoy, where it was ringed at an age of one year on 7th June 1998 and found dead in Tórshavn 337 days later.

The highest recovery-rate was found for the Tórshavn study in 2002, when 59% of the 112 ringed birds were recovered. Also in Sumba, the recovery-rates were high, 29% for the sparrows ringed in 2004 and 17% and 26% of those ringed in 2002 and 2006. Of the birds ringed on Nólsoy, the overall recovery rates was 7%, varying between 0% and 15%, being highest in 1987 (Table 1).

Discussion

The Faroe Islands is an archipelago with narrow fjords and straits separating the islands. This makes the house sparrows fully capable of reaching all parts of the archipelago by means of flight. However, we find that the Faroese house sparrow are extremely sedentary and of 2,167 house sparrows ringed, only two birds were recovered outside the villages where they had been ringed.

The low degree of dispersal for the Faroese house sparrows found in the present study is also in accordance with its dispersal patterns of the islands, which indicate that

the house sparrow reluctant crossing open water or mountain barriers separating the Faroese settlements (Bengtson *et al.*, 2004). Therefore, new colonization mainly occurred along the coast and open areas with sources from the neighbouring settlements. Thus, it took long time to spread all over the islands. During the years 1940 to 1962, 27% of the settlements had been colonised. In 1972 this had attained to 35%, in 1988, 65% and in 2002, 80% of the 118 Faroese settlements were more or less colonised by the house sparrow (Bengtson *et al.*, 2004).

Indeed, the low dispersal between villages observed in the Faroese ringing studies, the results are in accordance with earlier findings for this species, both world-wide (Summers-Smith, 1988; Wernham *et al.*, 2002; Bønløkke *et al.*, 2006; Bakken *et al.*, 2009) and in the Faroe Islands (Jensen and Kampp, 1997). Besides low, or hardly any migration between villages, high fidelity to the area for the house sparrow has also been demonstrated in other studies. A review of Danish ringing studies during the 19th century showed, that of 873 recoveries, 84% were within 1 km of the ringed site and 98 % within 10 km (Bønløkke *et al.*, 2006). Investigations of the Faroese house sparrow show similar results. In a small-scale study, where 112 house sparrows were colour banded at seven different locations in Tórshavn, most recoveries were sighted within 500 m (max. ca. 1600 m) of the ringing site (Eliasen and Jacobsen, 2002).

Generally, the dispersal of the house sparrows depends on the birds age, being highest for the juveniles (Summers-Smith 1988). Once the house sparrow has bred, it usually remains faithful to the breeding area and, according Summers-Smith (1988), they rarely move more than two kilometres to find food. This statement is also in accordance with results found elsewhere. Based on nearly 6,000 recoveries, Paradis *et al.* (1998) calculated the mean natal dispersal to be 1.7 km and breading dispersal 1.9 km in different places in the UK. In Norway, the average distance between ringing and recovery sites was a little longer: 4 km for those ringed as fully fledged and 12 km for those ringed as nestlings (Bakken *et al.*, 2009).

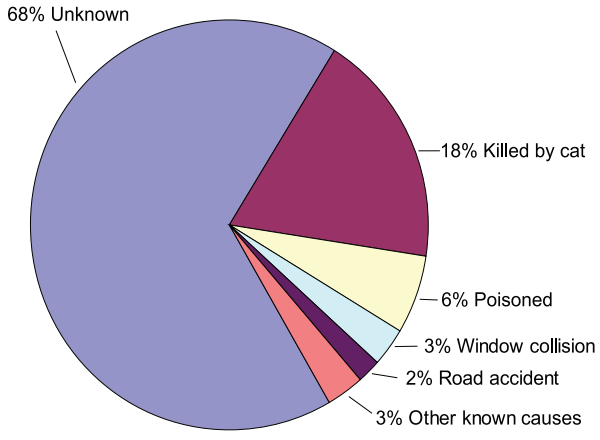

Figure 3. Cause of death for house sparrows ringed in the Faroe Islands (n= 98).

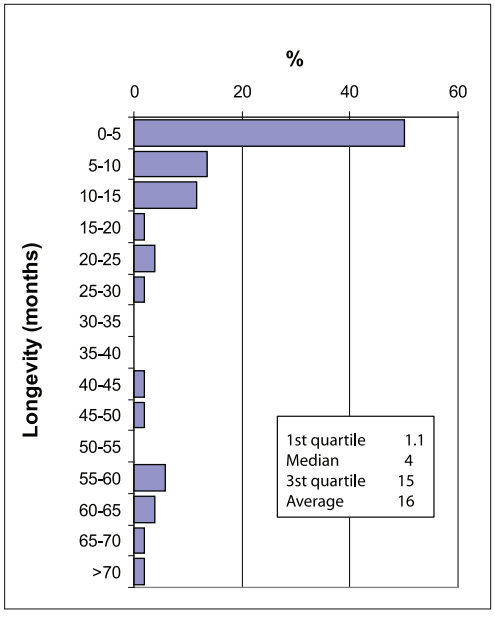

Figure 4. Life-span of Faroese house sparrows ringed as nestlings or juveniles in their first autumn and recovered as dead (n=52).

The total recovery of the house sparrow found in present study was 10%, which is high compared to other studies, reported from neighbouring countries. In Norway, only 1.8 % of 28,724 ringed house sparrows recovered during the 19th century (Bakken *et al.*, 2009). In Denmark the recovery rate was 2.4% (Bønløkke *et al.*, 2006) and in Britain and Ireland, only 1.5% of 411,478 ringed house sparrows were recovered (Wernham *et al.*, 2002). However, differences in landscape and topography make comparisons between countries difficult.

In the Faroese ringing studies, the highest recovery rate was found for house sparrows ringed in Tórshavn in 2002, where the recovery score was 59%. In this study, all the sparrows were 'older than 1st calendar year' when ringed, which also is the reason for the particular high recovery rate of this age group (36%), compared to other age groups ringed (8% and 9%). Also in the recent studies in Sumba, the recovery rates were high (17% to 29%). In all of these studies, there were extensive field activities. In Tórshavn, where 112 house sparrows were colour-banded at seven different locations, it was possible to track the individual birds, which accounted for the high recovery rate (Eliasen and Jacobsen, 2002). In Sumba, the ringing studies were carried out during a period of one month in August and September. In these studies, house sparrows were caught daily by mist nets, which gave recovery of both newly ringed sparrows and of bird ringed in the years before.

The life-span for the Faroese house sparrow was estimated to be 1.3 years, in average. Of those, ringed as nestling or juveniles in their first autumn, one half were recovered as dead within 4.1 months. This life-span is comparable to Danish results, where 67% of the house sparrows ringed as nestlings or juveniles in their first autumn were recovered dead within the first year and additionally 18% after two years (Bønløkke *et al.*, 2006). Similar results were found for house sparrows ringed in Norway (Bakken *et al.*, 2009).

Of known death reasons, "killed by cat" was the most common (18%).

This is lower than found in Norway (26%) (Bakken *et al.*, 2009), but higher than in Denmark (7%) (Bønløkke *et al.*, 2006). The oldest house sparrow recovered in the Faroe Islands was 9.9 years.

The oldest house sparrow reported in Denmark was 18.5 years (Bønløkke *et al.*,

2006) and in Norway, 3.8 years old (Bakken *et al*., 2009).

In conclusion, the Faroese house sparrows are very stationary and are rarely found outside the area where they were ringed. Furthermore, it is conclude that the recovery rate from ringing studies on Faroes house sparrow generally has been high.

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