



EURING SWALLOW PROJECT

FIELD MANUAL

Revised version

Compiled by Lukas Jenni

Based on material by

Fernando Spina
Arie van Noordwijk
Hannes von Hirschheydt
Lukas Jenni
Andrea Pilastro

Manual of Field Methods of the European-African Songbird Migration Network

Sempach, Switzerland

March 1998

Contents

Introduction	3
General aims of the project	3
Organization of data collection, data transfer and data analysis.....	4
Organization of data collection by EURING	
Organization of data collection within countries	
Field work of the ringers	
Data collection by the ringing schemes	
Data transfer to the EURING co-ordinators	
Data analysis	
Breeding biology	6
Aims	6
Field work	7
Study area	
Recording nest sites	
Recording breeding biology and ringing	
Data to be collected	8
Map of the study area	
Summary sheet on breeding biology	
Nest record form	
Ringing list for breeding period	
List for retraps and controls of breeding period	
Roosts and migration.....	14
Aims	14
Field work	15
Inventory of Swallow roosts	
Ringing at roost sites	
Ringing during the migratory period	
Data to be collected	16
Roost description and summary sheet	
Ringing list for roosts	
List of retraps and controls in roosts	
Wintering area	19
Aims	19
Field work and data collection.....	20
Instructions for data collection	21
Sexing and ageing of the Swallow	22
Determination of the age of nestlings.....	23
Feather-length of third outermost primary	24
Tail measurements.....	25
Fat score	26
Muscle score	28
Moult recording	29
Data transfer and contacts.....	31
Data transfer.....	31
General	
Computer files	
Contacts and addresses	32
Examples of data forms	33



Introduction

General aims of the project

The general aims of this project are three-fold:

- to study two major biological questions, namely variation in survival rates and natal dispersal, which both can only be answered with the help of bird ringing;
- to provide insights into the effects of human impact on bird populations (integrated monitoring) and a scientific basis for international conservation strategies for Palearctic-African migrants;
- to study these two questions on a continent-wide scale and year-round.

Data on variation in survival rates and natal dispersal provide information on the boundaries between populations; this has applied as well as basic science implications. Integrated monitoring of breeding populations is becoming more and more important for conservation purposes, as following the fate of individuals is essential to formulate and test hypotheses about the causes of changes in population densities.

Especially for a migrating species, a comprehensive study including the breeding, the migration and the wintering season on a continent-wide scale has never been undertaken. It would provide major insights into the population dynamics and, hence, the effects of different environmental conditions on a migrant along the migratory routes and on the key staging areas.

The Swallow as the target species

The Swallow (*Hirundo rustica*) is a common bird closely associated with human dwellings throughout a large part of Europe. It is an insectivorous long-distance migrant with sexual dimorphism. The nestling period is relatively long and breeding is often colonial, usually inside farm buildings. Both in the breeding area and on the wintering grounds, the effects of human impact on the environment of Swallows are enormous. Ecological conditions on the rural breeding areas are subject to modifications in agricultural practices, while on migration and in winter, Swallows rely heavily on reed beds for roosting: these fragile habitats are highly threatened both in the Palearctic and in Africa. During recent decades, a slow but steady decrease in Swallow breeding populations has been recorded in many European countries.

For these reasons it is an ideal choice for a Europe-wide project to collect extensive data on the breeding biology, adult survival rates and the natal dispersal. It is a good candidate for the project also because the close association of Swallow breeding with human habitation makes it possible to visit nests and to have mist-netting activities near the nests without any danger of disturbing the habitat around the nests.

Organization of data collection, data transfer and data analysis

A project which is based on the collaboration of a large number of ringers in many countries necessitates the use of the same standardized methods. Otherwise, data cannot be compared and the entire project is flawed. Hence, we strongly ask all participants to adhere to the instructions given here.

Organization of data collection by EURING

By this manual, EURING sets the standards of data collection. The data described in this manual are the minimum data to be collected. Ringing schemes and ringing groups are free to add additional data (e.g. wing-length of nestlings) and investigations (e.g. estimations of food availability), provided that they do not interfere with the data collection recommended in this manual.

Organization of data collection within countries

Usually, data collection within countries is organized by the respective ringing scheme. In many countries, the instructions of this field manual need to be translated by the ringing schemes.

Based on the instructions in this field manual, ringing schemes are free to ask for additional data to be collected and to work out their own data forms or instructions for direct input of data on computers by the ringers. However, these country-specific instructions have to ensure that the minimum data recommended in this field manual are correctly collected by the ringers.

Field work of the ringers

For most of the questions of this project, it is recommended that ringers work in groups. All ringers have to observe their national regulations and need the permissions necessary for their work. Ringers generally send their data to their ringing scheme.

Data collection by the ringing schemes

At this stage of the project with no financial support, ringers and ringing schemes are asked to enter the data into computer files.

Ringing schemes (or group of ringers) are asked to send data on disks to the EURING co-ordinators.

Data transfer to the EURING co-ordinators

In order to facilitate European-wide analyses of the data (the prime aim of this project), all data are collected centrally by EURING co-ordinators. For the breeding biology, the EURING co-ordinators are Arie van Noordwijk, Luc Schifferli and Hannes von Hischheydt; for the migration and roost part of the project, the EURING co-ordinator is Fernando Spina.

At this stage of the project, only computer files can be accepted. Data on breeding biology should be sent to Luc Schifferli and Hannes von Hischheydt, data on migration and roosts should be sent to Fernando Spina.

Important: All ringing schemes are asked to send an overview of the data collected to Fernando Spina on paper: the proposed forms "Summary sheet on breeding biology" and "Roost description and summary sheet". This information will be used by Fernando Spina for the Swallow Newsletter.

Please consult the chapter "Data transfer and addresses" for further details and deadlines.

Data analysis

Needless to say that each ringing group and ringing scheme is free to analyse their own data.

Despite the fact that EURING has not yet financial support for this project, EURING will undertake every effort to guarantee a European-wide data analysis.

It is understood that data sent to the EURING co-ordinators can be used for European-wide analyses (not for analyses specific to the country or site) by researchers. Applications and appointments for data analysis are evaluated and co-ordinated by the Board of EURING.



Breeding Biology

Aims

The Swallow, traditionally one of the most common and widespread bird species in European farmland habitats, is experiencing a widespread decline over most of the continent. Different causes could be responsible for these negative population trends, and habitat changes or pesticide use have been put forward as the main explanations for the decline in some countries. A large-scale integrated analysis aimed at identifying the ecological factors threatening European Swallows is urgently needed in order to plan biologically sound conservation policies.

In terms of demographic parameters of our breeding populations, we need to determine whether the declines are a consequence of decreased breeding success or survival rates (or a combination of both), or whether it is habitat loss, or change of use of habitat, the key factor to be taken into account.

Studying Swallows in their breeding quarters through the involvement of large numbers of volunteers collecting data both through ringing and census work will provide data on their breeding success with respect to habitat types as well as to human activities.

The widespread increase in habitat fragmentation can be one of the main causes reducing gene flow between increasingly artificially segregated bird populations. One of the main potential sources of information on gene flow is represented by data on natal dispersal, defined as the distance between the site of birth and the site of first breeding. Again, the European ringing community offers a unique potential to collect such information on a wide geographical range. Different habitats and areas subject to different agricultural regimes will be selected in each country, providing the opportunity of studying natal dispersal in Swallow populations breeding in fairly homogeneous and natural habitats, vs those which are patchily distributed in areas which only offer scattered breeding opportunities (e.g. highly urbanized and industrialized regions, farmlands subject to modern monoculture with modern cattle stables, etc.).

The main aims are to document differences in breeding success, in local recruitment rate, in adult return rates and in movements between farms within study areas related to environmental contrasts, such as wet/dry, rich/poor soils and small/large scale agriculture. It is believed that differences between areas where the species is declining in numbers and areas where the species is doing well may be attributed to as yet unknown combinations of the above factors.

Answering these questions will provide sound information to understand the key factors affecting European Swallows on their breeding grounds. Data on their breeding success will offer a very useful parameter to evaluate the impact of agricultural practices and habitat modification on European insectivorous birds. Gathering data on adult return rates to the breeding territories will also provide information on survival rates of the different geographical populations of European Swallows; these results will again be a very useful parameter to monitor the general ecological conditions our birds are experiencing on their African winter quarters.

Field work

Study area

In order to obtain data on return rates and natal dispersal, a specific study area with a certain number of breeding pairs should be chosen and its Swallow population followed over several years. Study sites within one country are preferably situated in different landscapes (e.g. large / small-scale agriculture, rich / poor soil, etc.).

Ideally, a continuous study area with a homogeneous landscape containing 60 - 80 breeding pairs should be chosen. In order to follow this number of breeding pairs, usually a group of ringers working together is needed.

Recording nest sites

Before the breeding season, search for potential nest sites. Get into contact with the owners, managers and people of the buildings with Swallow nests. Inform them about your future work and ask for permission.

Record data about the situation of each nest (nest record form) and map them. For identification of nests in later years, mark them (e.g. with a numbered drawing pin near the nest).

Recording breeding biology and ringing

It is important to follow all breeding pairs, ring all nestlings and as many adults as possible within a study area.

Check each nest from the beginning until the end of the breeding season at least once a week. Record your observations on the nest record form.

Ring all nestlings and take data on age, body mass etc.

Catch and ring as many adults as possible and take data on sex, condition and size. Re-capturing ringed adults in later years may be difficult when using mist nets and you may have to resort to arriving concealed (e.g. not with your own car) and putting up the nets very rapidly. Another method is to catch the adults at night from their nest or roosting place, either by hand or with a hand-net, and put them back on their roosting place after ringing and measuring.

Data to be collected

The data to be collected can be conveniently recorded on a map and 4 different forms.

Map of the study area

- Indicate the study area.
- Mark all buildings with Swallow nests and number them on the map. This building number serves as a reference number for all other forms. In some instances, it is convenient to use a number for the farm (containing several buildings) and a second number for the building within each farm (e.g. 3/2 = farm 3, building 2).

Additional data which may be of interest are e.g. characterization of the study area, local weather during the breeding season.

Summary sheet on breeding biology

Important: This sheet should be sent to the EURING co-ordinator Fernando Spina for the elaboration of the Swallow Newsletter.

- Head of the form: study area and year
- For each building (or farm) record
 - Building (or farm) number
 - Co-ordinates of the building: geographical co-ordinates (accuracy 5'') or national grid (accuracy 100 m).
 - Type of building: stable with indication of main species of livestock, barn, garage, hangar, dwelling-house, bridge, etc.
 - Total number of natural and artificial nests present
 - Number of natural and artificial nests occupied by Swallows (an occupied nest is defined as a nest with at least one egg during the breeding season)
 - Number of nestlings ringed
 - Number of fledglings ringed, i.e. fledglings ringed at breeding sites which cannot be assigned to a specific nest.
 - Number of adults ringed
 - Number of individuals retrapped or controled
- At the bottom of the sheet, give the total number of nests, nests occupied by Swallows, and birds ringed.

Additional data which may be of interest are e.g. modifications on the building during the study period or since last year, type of agriculture (conventional or organic farming), use of pesticides within and outside the buildings, name and address of the owner or manager, etc.

Nest record form

In many cases, traditional nest record cards may be used or adapted to the specific requirements of this project. It is rather difficult to define categories for the description of the nest situation, because these may vary among countries and regions. Therefore, we ask ringing schemes to propose appropriate categories for their country.

In order to estimate nest success, it is important that ringers record each nest visit.

Important: Please use a separate nest record form for each brood/breeding attempt. Send copies of all nest record forms to the EURING co-ordinator; they are needed to check data on breeding success and timing of breeding as well as for additional data not on the computer files (e.g. causes of losses).

- Head of the form: study area, year, building (farm) number, nest number (e.g. 3/5 = building 3, nest 5; 3/2/5 = farm 3, building 2, nest 5), name of observer.
- Description of the nest situation
 - Location:
 - if inside the building:* in stable with indication of species of livestock, in barn, in cellar, in garage, in inhabited/non-inhabited room, in loft, etc.
 - if outside the building:* at outside wall, passage, open shelter, etc.
 - If inside the building: estimate mean length, width and height of room (m)
 - Position of nest: Estimate height above ground and the distance between the upper nest rim and the ceiling (cm)
 - Type of nest: natural, artificial
 - Age of the nest: constructed this year, before this year, unknown, year known
 - Support of nest: none, board, beam, lamp, wire, etc.
 - Background of nest: wood, brick, concrete, steel, etc.
- For each nest visit record
 - Date
 - Time of day (local time)
 - Condition of the nest: suitable or unsuitable for breeding, occupied by another species
 - Number of adults in the nest or flying off the nest
 - Number of adults near the nest
 - Number of unbroken eggs
 - Number of living nestlings
 - Age of nestlings
 - Number and causes of egg or nestling loss
- From the nest visit records, ringers are asked to indicate or calculate 11 key data of the breeding biology. These data are crucial for any analysis on the breeding biology of the Swallow. The calculation of these data, particularly the dates, may seem complicated. However, this information is very important and the ringer collecting the data in the field is in the best position to calculate these data with all the information available to him.

For each brood/breeding attempt, we would like to receive the 11 data listed below. It is often not possible to get completely accurate data, so there is a second column for each of these data that gives the number of eggs, young or days plus or minus around the data indicated.

Dates: On the nest record form or in the computer data file, you may indicate the true date (e.g. 15.5. = 15 May) or the day number relative to 1 January. The following table gives you the day number for each date from early March to late September. Day numbers are sometimes easier for calculating certain dates.

- Breeding attempt: Indicate whether it is a first, second or third brood/breeding attempt. If unknown, indicate the number 9.
- Number of eggs: Indicate the maximum number of eggs you actually observed. If uncertain, indicate the uncertainty (e.g. 4 eggs \pm 1). If you did not observe eggs, indicate the number 99.
- Number of nestlings: Indicate the maximum number of living nestlings observed.
- Number of unhatched eggs: Indicate the number of unhatched eggs in the nest when the oldest nestlings are 3 days old or older.
- Number of fledglings: This is often quite difficult to determine. Indicate the number of nestlings during your last visit before fledging. However, because only part of fledged nestlings may return to the nest in the evening, beware of evening visits.
If you do not know whether any nestlings have fledged at all (e.g. because the nest disappeared), indicate the number 98.
If you do not know how many nestlings fledged (e.g. because you observed nestlings only once and this number is indicated under „number of nestlings“), indicate the number 99.

The following three data concern your actual observations, not calculated or inferred data.

- Number of visits: Indicate the total number of visits (each day counted only once) with at least one egg or nestling observed for this brood/breeding attempt.
- First date with maximum number of eggs/nestlings: Indicate the first date you actually observed the full clutch (i.e. exclude dates before or during egg-laying). In case that you observed no eggs or only the beginning of egg-laying, indicate the first date you observed nestlings.
- Last date before fledging: Indicate the last date you actually observed nestlings. Do not include dates when you observed fledged nestlings returning to the nest in the evening for roosting.

The following three dates usually concern calculated dates, because the start of egg-laying, hatching or fledging is rarely observed directly.

- Date of start of egg-laying: Swallows lay at a rate of one egg per day and eggs are normally laid around dawn. The date of start of laying can be determined accurately if there is a nest visit during the laying period. E.g. on day 159 (= 8 June) there are 4 eggs and at the next visit there are 6 eggs, we draw the conclusion that eggs 5 and 6 were laid on day 160 and 161 and the first four eggs on 156, 157, 158 and 159, so that 156 (or 5 June) is the laying date of the first egg which is indicated in the form. In this case we are sure, so the uncertainty column gets a zero. The general rule is: laying-date = date of observation of an incomplete clutch minus the number of eggs observed at this visit + 1. If there is no observation of an incomplete clutch, we can deduce the laying date from the hatching date. See below.
- Hatching date: The hatching date is deduced from the age of the nestlings at the first visit after hatching. The hatching date of the oldest chick (calculated from its estimated age) is day one. Thus, if the oldest chick is aged day 6 on day 187 (= 6 July), the hatching date is day 182. In this case, the inaccuracy is 1 day if nestlings were aged before 8 days old, and 2 days if the first ageing was on older nestlings.

If the date of the start of egg-laying could not be determined directly from a visit during egg-laying, it is calculated from the hatching date: laying-date = hatching date minus clutch size minus 13. This calculation assumes an incubation time of 14 days and an onset of incubation on the day that the last egg was laid. The inaccuracy column should be the inaccuracy of the hatching date + 1.

- Fledging date: There will rarely be direct observations on fledging date. Normally fledging date is calculated from hatching date + 20. Inaccuracy is the inaccuracy of the hatching date + 1.

Important: In quite some cases, calculated dates will lead to conflicts with direct observations. In these cases, the calculated dates are to be adjusted with the available information.

Example 1: Due to cold weather the onset of incubation is delayed. Therefore, the calculated laying date is later than the real one. It is possible that a nest visit was made on a date when the clutch should not yet have been complete according to the calculated date, but in fact was complete. Thus, the real laying date must have been earlier than the calculated one and the calculated date must be adjusted. Visits: Day 172 empty nest; day 181 clutch of 7 eggs; day 191 clutch of 7 eggs; day 200 brood with nestlings aged day 3. Calculated hatching date = 198, inaccuracy 1. Calculated laying date = $198 - 13 - 7 = 178$, inaccuracy 2. However, with this laying date there would have been only 4 eggs on day 181! Therefore the laying date must have been 173, 174 or 175. In this case, the laying date becomes 174 inaccuracy 1.

Example 2: The calculated fledging date is day 198, but at a visit on day 197 the nest was already empty. In this case the fledging date should be filled in as 196 inaccuracy 1 day.

Example 3: The calculated fledging date is day 196, but at a visit on day 197 there were still nestlings in the nest (not during an evening check with possibly fledged young returning to the nest for roosting). In this case, the fledging date becomes 198 with an inaccuracy of 1 day.

Table: Date and day number since 1 January for the period 7 March to 22 September, grouped in standardized five-day periods. Because Swallows normally do not start breeding before March, these day numbers are also to be followed in leap-years (e.g. year 2000).

Date	Day nb	Date	Day nb	Date	Day nb	Date	Day nb	Date	Day nb
Mar 7	66	Apr 16	106	May 26	146	Jul 5	186	Aug 14	226
Mar 8	67	Apr 17	107	May 27	147	Jul 6	187	Aug 15	227
Mar 9	68	Apr 18	108	May 28	148	Jul 7	188	Aug 16	228
Mar 10	69	Apr 19	109	May 29	149	Jul 8	189	Aug 17	229
Mar 11	70	Apr 20	110	May 30	150	Jul 9	190	Aug 18	230
Mar 12	71	Apr 21	111	May 31	151	Jul 10	191	Aug 19	231
Mar 13	72	Apr 22	112	Jun 1	152	Jul 11	192	Aug 20	232
Mar 14	73	Apr 23	113	Jun 2	153	Jul 12	193	Aug 21	233
Mar 15	74	Apr 24	114	Jun 3	154	Jul 13	194	Aug 22	234
Mar 16	75	Apr 25	115	Jun 4	155	Jul 14	195	Aug 23	235
Mar 17	76	Apr 26	116	Jun 5	156	Jul 15	196	Aug 24	236
Mar 18	77	Apr 27	117	Jun 6	157	Jul 16	197	Aug 25	237
Mar 19	78	Apr 28	118	Jun 7	158	Jul 17	198	Aug 26	238
Mar 20	79	Apr 29	119	Jun 8	159	Jul 18	199	Aug 27	239
Mar 21	80	Apr 30	120	Jun 9	160	Jul 19	200	Aug 28	240
Mar 22	81	May 1	121	Jun 10	161	Jul 20	201	Aug 29	241
Mar 23	82	May 2	122	Jun 11	162	Jul 21	202	Aug 30	242
Mar 24	83	May 3	123	Jun 12	163	Jul 22	203	Aug 31	243
Mar 25	84	May 4	124	Jun 13	164	Jul 23	204	Sep 1	244
Mar 26	85	May 5	125	Jun 14	165	Jul 24	205	Sep 2	245
Mar 27	86	May 6	126	Jun 15	166	Jul 25	206	Sep 3	246
Mar 28	87	May 7	127	Jun 16	167	Jul 26	207	Sep 4	247
Mar 29	88	May 8	128	Jun 17	168	Jul 27	208	Sep 5	248
Mar 30	89	May 9	129	Jun 18	169	Jul 28	209	Sep 6	249
Mar 31	90	May 10	130	Jun 19	170	Jul 29	210	Sep 7	250
Apr 1	91	May 11	131	Jun 20	171	Jul 30	211	Sep 8	251
Apr 2	92	May 12	132	Jun 21	172	Jul 31	212	Sep 9	252
Apr 3	93	May 13	133	Jun 22	173	Aug 1	213	Sep 10	253
Apr 4	94	May 14	134	Jun 23	174	Aug 2	214	Sep 11	254
Apr 5	95	May 15	135	Jun 24	175	Aug 3	215	Sep 12	255
Apr 6	96	May 16	136	Jun 25	176	Aug 4	216	Sep 13	256
Apr 7	97	May 17	137	Jun 26	177	Aug 5	217	Sep 14	257
Apr 8	98	May 18	138	Jun 27	178	Aug 6	218	Sep 15	258
Apr 9	99	May 19	139	Jun 28	179	Aug 7	219	Sep 16	259
Apr 10	100	May 20	140	Jun 29	180	Aug 8	220	Sep 17	260
Apr 11	101	May 21	141	Jun 30	181	Aug 9	221	Sep 18	261
Apr 12	102	May 22	142	Jul 1	182	Aug 10	222	Sep 19	262
Apr 13	103	May 23	143	Jul 2	183	Aug 11	223	Sep 20	263
Apr 14	104	May 24	144	Jul 3	184	Aug 12	224	Sep 21	264
Apr 15	105	May 25	145	Jul 4	185	Aug 13	225	Sep 22	265

Ringling list for breeding period

In many cases, the usual ringling lists may be used or adapted to the specific requirements of this project. However, it may facilitate field work if some explanations for recording ringling data are on each ringling list.

- Head of ringling list: Year, name of ringer
- Study area, province, country
- For each bird ringed (nestling or adult)
 - Ring number
 - Day, month
 - Time of day (hour)
 - Building (farm) number and nest number
 - Body mass (accuracy 0.1 g). Use 50g or 60g Pesola which can be interpolated to 0.1 g or an electronic balance with 0.1 g accuracy. (Calibrate your balance from time to time, e.g. using coins of known weight; one pound sterling coin is 9.50 g.)
- Additional data for nestlings
 - Age in days at the time of ringling
- Additional data for adults
 - Brood patch: 0 = no brood patch; 1 = indistinct brood patch; 2 = distinct brood patch
 - Sex: 0 = undetermined; 1 = male; 2 = female
 - Fat score
 - Muscle score
 - Feather-length of the third outermost primary
 - Length of innermost tail-feather
 - Length of right outermost tail-feather
 - Length of left outermost tail-feather

List for retraps and controls of breeding period

For every retrap and control, record the same data as for first ringings.



Roosts and migration

Aims

The Swallow is a symbol of bird migration. It is a species which has been ringed extensively in several countries; some of the first analyses of migratory routes in European birds referred to German Swallows. Yet, although quite substantial information exists on the main migratory routes followed by birds belonging to some of the European populations in autumn, much less detail is available on migratory directions and winter quarters of numerically important populations (e.g. those of Southern Europe).

Within the context of the need for an international approach to the conservation of migratory birds, the Swallow again offers typical examples of populations being 'shared' by different countries during their annual cycle. Recent data, for instance, indicate that Swallows breeding in a given country can cross political boundaries to reach their fattening areas (e.g. Slovenian Swallows fattening in Northern Italy on their way south).

In the pre-migratory phase, as well as in many cases during migration, Swallows make use of reedbeds to roost; these habitats are amongst the most threatened throughout Europe, and so far not much attention has been given to the problems related to the conservation of reedbeds from the Swallows' perspective. This project could therefore address the problem, and provide a first inventory of reedbed areas hosting Swallow roosts of particular importance.

The main aims for the pre-migratory phase (roosts) are:

- to describe general aspects of pre-migratory strategies of different European populations, through the analysis of the extent of moult, the physical condition and the levels of fat accumulation shown by birds using roosts at different locations along the autumn migratory routes;
- to identify and map the main roosts in the different countries, with an attempt to interpret their location with respect to the wider geographical distribution of reed beds; to describe alternative habitats used for roosting also in relation to breeding distribution (e.g. through a geographical overview of the use of maize fields);
- to describe Swallow movements among roosts through capture/recapture data; aiming to identify the 'catchment areas' of the roosts;
- to contribute to the conservation of reed-beds, by interactions with different approaches to the same problem (i.e. wetlands & waterfowl).

The main aims for the migratory phase are:

- to describe the migratory routes of the different European populations both in autumn and spring through recoveries/controls of birds ringed during the breeding season;
- to describe the movements of migration fronts in autumn and spring across Europe;
- to analyse the energy demands of the migratory journeys on the basis of available simulation models, in order to identify the requirements of Swallows for migrations with special reference to fattening and fasting strategies and the network of intermediate stopover areas used by the birds.

Field work

Inventory of Swallow roosts

Ringling schemes and partner organizations are asked to map Swallow roosts in their country and indicate the main vegetation (reed, maize, etc.) and an estimate of the number of Swallows visiting the roost (including the date(s) of estimates).

Ringling at roost sites

Ringling Swallows at roost sites allows marking large numbers of birds with relatively little effort. Often, very large numbers can be caught which surpass the capacity of the ringers and assistants for careful processing and data collection.

Therefore, it is VERY IMPORTANT that experienced ringers are involved with catching at roosts and that the numbers caught match the capacity of the ringers present. It is much better to ring only 100 birds during an evening which are all measured and processed correctly than several hundreds which cannot be processed efficiently.

Ringers or groups of ringers select one roost site. This roost should be worked during the whole pre-migratory period at regular intervals. Depending on the available time, there are the following two possibilities of collaboration:

- Either: At least one session per week starting during the breeding season when the roost is being occupied until the roost is abandoned. The aim is to ring at least 100 birds per week, although lower numbers are expected during the end of the season. The period of roost occupation may vary with latitude; in central Europe it is between June and October.
- Or: One session per week, starting 20 August until the roost is abandoned (the main pre-migratory phase).

Trapping should take place during the evening and a tape with Swallow song and calls may be used to attract birds to the mist nets. In order to minimize disturbance, the mist nets should be put up at the edge of the roost or at some distance, not in the roost itself. Be as quiet as possible and use lamps as little as possible. If you observe these precautions, you minimize the probability of roost abandonment. Because the Swallows are coming anyway to the roost where the nets are set, tape luring is unlikely to greatly affect the birds' behaviour and, therefore, may be used during such ringling activities.

Simultaneously with catching, the numbers of Swallows and other species attending the roost are estimated.

Ringling and processing of the Swallows has to be done as efficiently, quickly and correctly as possible. Please make sure to record the hour of taking body mass and fat score; take scores and measurements correctly! It is better to have 100 Swallows weighed before 2200, than 500 weighed later into the night. Alternatively, you may take body mass and fat score as soon as possible, and ring and measure the birds later-on.

It is advisable to use rigid cardboard boxes (or the like) for transporting the birds from the nets to the ringing site and when the Swallows have to be kept overnight. In bags, the wings and tails of Swallows would be bent too much. If kept overnight, release the birds in the early morning at the place of capture.

Ringling during the migratory period

In order to increase the chances of controls, trapping and ringling of Swallows during the migratory periods is to be generally encouraged by the ringling schemes.

The possibilities depend on the local circumstances. At some ringling sites (in resting habitats or on mountain passes), for instance, it may be possible to place additional nets especially for catching Swallows or to attract Swallows by tape luring.

Data to be collected

This part of the project critically depends on the comparison of data from many roost sites all over Europe and, therefore, on the standardization of data collection. Please follow the instructions as exactly as possible, especially for recording body mass, feather length, fat and muscle score.

The data to be collected can be conveniently recorded on 3 different forms.

Roost description and summary sheet

Important: This sheet should be sent (usually *via* the ringling scheme) to the EURING co-ordinator Fernando Spina for the elaboration of the Swallow Newsletter.

- Head of the form: Year, name of ringer
- Locality of the roost
 - Name of nearest village, province, country
 - Co-ordinates of the roost
- Description of the roost
 - Vegetation: reed (*Phragmites*), reed (*Arundo*), reed and willows, maize, etc.
 - Roost site flooded / not flooded / partially flooded
 - Extent of the particular vegetation (including parts which are not used for roosting): < 1 ha, 1-5 ha, 6-10 ha, 11-50 ha, > 50 ha
 - Roost site used over several years: unknown, yes, no
 - Is the roost stable during the season: unknown, yes, no; dates when occupied

- Summary of the ringing activities: For each ringing session record
 - Date
 - Length of mist nets used (m)
 - Starting and ending time of tape luring
 - Total number of Swallows ringed
 - Number of first-year Swallows ringed
 - Number of adult Swallows ringed
 - Total number of Sand Martins ringed
 - Estimated number of Swallows and Sand Martins roosting: < 100, 100-500, 500-1000, 1000-5000, 5000-10000, > 10000
 - Estimated percentage of Swallows included in the above estimate.
- At the bottom of the sheet, give the total number of ringed Swallows, first-year Swallows, adult Swallows and Sand Martins.

Ringling list for roosts

In many cases, the usual ringing lists may be used or adapted to the specific requirements of this project.

- Head of ringing list: Year, name of ringer
- Locality of roost, nearest village, province, country, co-ordinates
- For each bird ringed
 - Ring number
 - Bird species (if other species are ringed as well)
 - Day, month
 - Time of day of weighing the particular bird (to the nearest hour) (local time)
 - Sex of adults
 - Age
 - Brood patch (only in adults): 0 = no brood patch; 1 = indistinct brood patch; 2 = distinct brood patch
 - Fat score
 - Muscle score
 - Feather length of third outermost primary
 - 'Tail-fork' (only in adults): distance between the tips of the innermost and the longest outermost tail-feather (0.5 mm precision). This measurement is easy to take and allows to examine in more detail geographical variation of sex-specific limits. Alternatively, the same three measurements as recommended during the breeding season may be taken which, however, take more time.

- Intensity of body feather moult
- Moult of primaries
- Body mass (accuracy 0.1 g). Use 50g or 60g Pesola which can be interpolated to 0.1 g or an electronic balance with 0.1 g accuracy.

List for retraps and controls in roosts

For every retrap and control, record the same data as for first ringings.



Wintering area

Aims

The Swallow is a typical long-distance migrant with its main winter quarters south of the Sahara. It is the most commonly ringed passerine species in large parts of Africa, particularly South Africa, where ringers are very keen in following winter roosts. Large numbers of Swallows have also been marked in recent years at important roost sites in Botswana and Nigeria by British, German, Dutch and Italian ringers.

Despite the fact that quite large sets of winter recoveries are already available for some of the European populations, interesting changes were observed in the winter range of some of these populations in recent years (e.g. Swallows from the British Isles) which suggest the opportunity of a long-term monitoring of the evolution of wintering ecology also of birds belonging to the so far best known populations in terms of distribution in Africa.

The recent discovery of a huge roost in Nigeria containing up to 40 million birds and facing serious problems of harvesting of large numbers of birds by local people has drawn attention to the need for the identification and protection of such important areas. This has also highlighted the importance of the involvement of international conservation bodies in addressing conservation-oriented education programmes and integrated management policies.

A further interesting area of research is the study of moult strategies of different geographical populations in Africa. This might also help to interpret the information gathered in recent years from Swallow moult studies in Southern Europe.

The main aims are:

- to identify the winter quarters of the different European populations;
- to locate main African winter/spring roosts of crucial importance for European breeding Swallows;
- to help to initiate a strategy plan for the conservation of the main African roosts together with international conservation agencies;
- to study winter moult patterns of the different populations, in order to get a general overview of the geographical variation in moult strategies shown by a widespread long-distance migrant.

Field work and data collection

The methods of field work and the particular data to be collected depend on the local possibilities and circumstances and cannot be worked out in more detail at this stage of the project.

However, in many cases it should be possible to follow the instructions given in the chapter "Roosts and migration". It is essential that the same measurements as recommended here are taken as a minimum.

For recording moult, it is essential to record the score of individual flight feathers and not a global moult score, because it is to be expected that - apart from the timing of moult - the speed of moult may vary between populations and sites. The speed of moult, however, is best recorded by moult scores of individual flight feathers which indicate the number of simultaneously growing feathers. Therefore, the use of moult cards is recommended.



Instructions for data collection

This set of instructions collects detailed descriptions of all data which are not self-evident to record. They are largely based on the Manual of Field Methods of the European-African Songbird Migration Network (Bairlein 1995).



Sexing and ageing of the Swallow

Basis of ageing and moult

First year and adult birds usually undergo a complete moult in the winter quarters. Compared with other small passerines, the duration of wing feather moult is very long and many Swallows are still moulting in April. Hence, some birds arriving in Europe in spring have still growing outer primaries or rectrices or, exceptionally, may retain primary 9.

In summer, some first-year birds start renewing body-feathers in Europe and continue to do so during at least the first part of migration. Rarely, some innermost marginal and median coverts are also moulted in Europe. In a few cases, first-year birds with growing innermost primaries were found in the Mediterranean area.

As in first year birds, adults may start moult of body-feathers in Europe in summer and continue during at least the first part of migration. Some birds moult some marginal and median coverts and a tertial. A varying number of adults starts primary moult in Europe (more frequently in southern than in northern Europe) and may show up to 5 primaries growing or renewed.

Ageing in summer and autumn

First year birds: Upperparts and wing-coverts dark brownish blue, only faintly glossy. Forehead and throat orange. Length of outermost tail-feather 60 - 75 mm.

Adults: Upperparts and wing-coverts glossy metallic-blue with a violet tinge. Forehead and throat mahogany. Length of outermost tail-feather over 75 mm.

Ageing in spring

After the complete moult in the winter quarters, second year birds and adults are indistinguishable on plumage characters.

Sexing

First year birds before the complete moult in the winter quarters are indistinguishable on plumage characters.

Adult male: 'Tail-fork' (distance between the tips of the innermost and the outermost tail-feather) > 58 mm or outermost tail-feather > 112 mm.

Adult female: 'Tail-fork' < 51 mm or outermost tail-feather < 93 mm.

Additional criteria for sexing adults during the breeding season: Birds with a prominent brood patch are females. Usually, the metallic gloss on the breast band is distinct in males and faint or missing in females.

If both adults of a nest are caught, sexing is usually possible, the bird with the longer outermost tail-feather and the glossier breast band being the male.

In roosts and on migration, not all adults can be sexed. Because there is probably geographical variation in tail-feather length and, consequently, in the sex-specific limits of tail-measurements given above, we ask all ringers to measure 'tail-fork' in adults so that more precise limits can be elaborated.

After Svensson (1992, Identification Guide to European Passerines) and Jenni & Winkler (1994, Moults and Ageing of European Passerines).



Determination of the age of nestlings

With some experience, it will be possible to determine the age of the nestlings to within two or three days. In order to fully take advantage of the experience of ringers, record the estimated age of nestlings to one day. Please report any improvements of the following criteria.

Day

1	Egg tooth present; eyes closed
2 - 3	No egg tooth; eyes closed; no feather follicles break through skin
4 - 6	Eyes open as narrow slits; follicle of first primaries and rectrices break through the skin
8 - 9	Feather tips sprout from primary and tail feather follicles; body covered with closed quills
13	Primaries ca half way out of sheaths; tips of most body feathers sprouting from their follicles
15	Primaries ca three quarters out of sheaths
18	Primaries full grown; nestlings soon fledge
NF	Outside of the nest, but not quite fledged
F	Fledged and near the nest

The nestling period is usually 20 - 24 days, rarely between 15 and 29 days.

Ringling of nestlings is recommended between the age of day (5-) 7 - 12 (-15).

After McGinn & Clark (1978, Bird Study 25:109-118) and others.



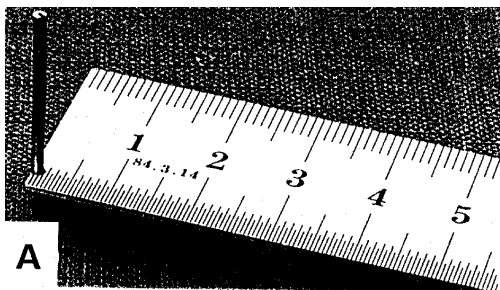
Feather-length of third outermost primary

In order to overcome problems with different methods of taking wing length and because feather-length is directly comparable between live birds and museum skins, the feather-length of the third outermost primary is chosen as the main measurement of size (see Berthold & Friedrich 1979, Vogelwarte 30: 11-21; Jenni & Winkler 1989, Bird Study 36: 1-15). Measuring feather-length is quickly and accurately done when observing the following instructions.

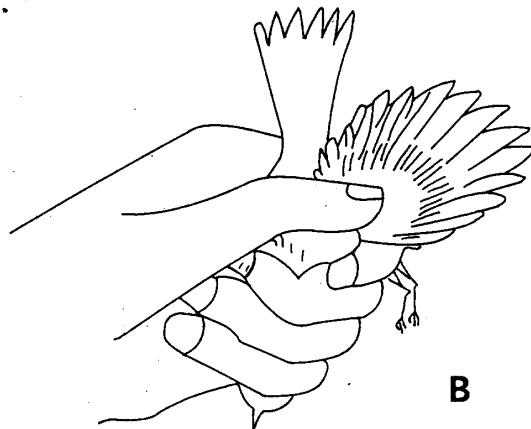
Use a ruler with a vertical pin of exactly 1.4 mm diameter (Figure A). Check the accuracy of the ruler with vernier calipers (should be <0.1 mm) and correct the position of the pin, if necessary. Small quantities of rulers can be obtained from Schweizerische Vogelwarte, CH-6204 Sempach. The ruler is fixed onto a block of wood or onto the table and the bird is held with both hands. Do not hold the ruler free-hand. By using this method the inter-observer variance of the measurement is significantly reduced.

Hold the wing at the carpal joint between your thumb and index finger (Figure B). Take the second outermost primary (F9) with the other hand, open the wing slightly and place the pin between the 2nd and 3rd outermost primaries (Figure C) until it firmly touches the skin. This point is easily found and well defined.

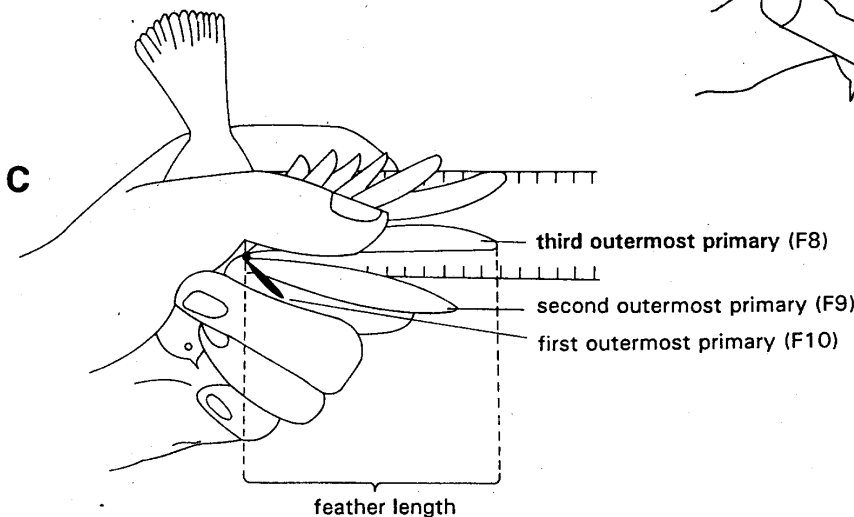
Now, without letting go the second outermost primary you are holding, pass the thumb of the hand you are holding the bird in front of the pin, and gently press on the third outermost primary in order to fix it on the ruler. Then, let the second outermost primary go and straighten the third outermost primary completely by first bending it outward a little (to get maximum length) and read the length to 0.5 mm. Make sure not to interfere with the primary coverts, i.e. the primary covert should be on the same side of the pin as the corresponding primary.



A



B



After Bairlein (1995, ESF-Network Field Manual)



Tail measurements

In the case of the Swallow, tail measurements are of particular interest for two main reasons.

First, the absolute length of the outermost tail-feather and the symmetry among the left and right outermost tail-feathers are indicators of the quality of the bird. This is of particular interest in breeding adults.

Second, tail measurements are indicators of the sex of adult Swallows. As explained in the sexing and ageing instructions, both the absolute length of the outermost tail-feather and the 'tail-fork' can be used.

In breeding adults, it is relatively easy to take all three indicators (absolute length of the outermost tail-feather, symmetry, 'tail-fork') by reading three measurements (length of the longest innermost, the right and the left outermost tail-feather) from a ruler placed only once between the tail-feathers and the undertail-coverts.

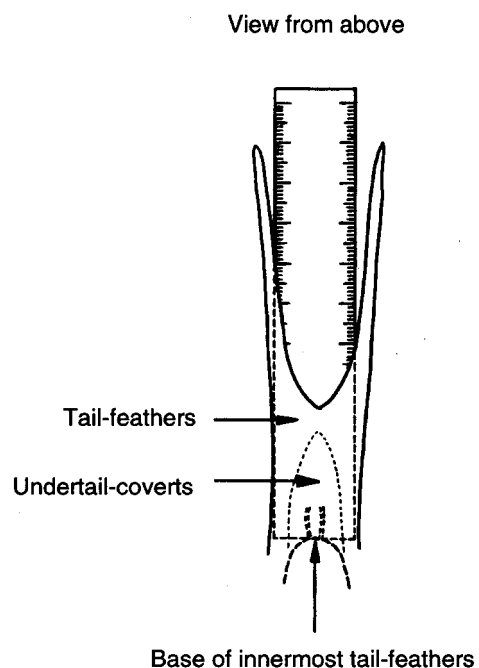
In adults caught in roosts, this procedure was thought to be too time-consuming, and the interest is mainly in sexing the bird. Because 'tail-fork' is usually a better indicator of sex than absolute tail-length, it is recommended to record 'tail-fork' only. However, it is of course possible to take the same three measurements as in breeding birds instead.

Measuring the length of tail feathers

Use a commercial transparent ruler 2-3 mm thick and at least 20 cm long. Cut it, so that it starts exactly at 0 mm. Lay the bird on its back in one hand. Insert the ruler between the tail-feathers and the undertail-coverts until it touches the body at the base of the tail-feathers. Place the tail feathers in a natural position, but with closed tail-feathers, on the ruler. Read the length of the longest innermost, the right outermost and the left outermost tail-feather to 0.5 mm by slightly straightening them.

Measuring 'tail-fork'

Place the tail in natural, but closed, position on a ruler. The tip of the longest innermost tail-feather is set at a convenient starting point (i.e. the 0, 10 or 20 cm mark). Read the distance between the tip of the longest innermost and the longest outermost tail-feather to 0.5 mm.





Fat score

The amount of visible subcutaneous fat is determined by scoring two fat deposits: (a) the furcular (intraclavicular depression, 'tracheal pit') and (b) the abdominal. A 9-grade score (0 - 8) is used, based on Kaiser (1993, J. Field Orn. 64: 246-255). It is important that the bird is positioned correctly and that both fat deposits are checked.

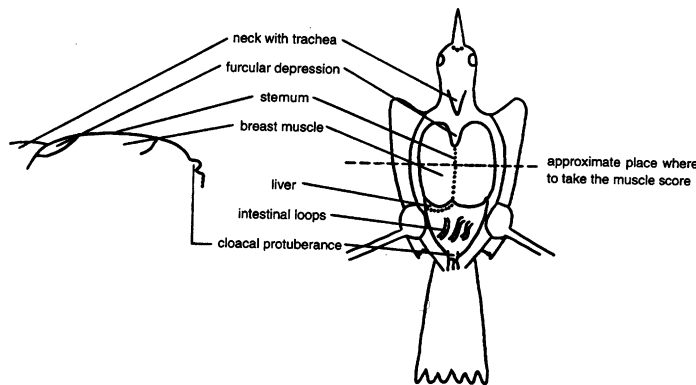
For fat scoring, use bright light which intensifies the contrast between the yellowish fat layers and the red muscle tissue. Fat scoring should be done before the bird is weighed to avoid any bias in fat scoring.

The bird is laid on its back in one hand and the legs are held with the other hand. First check the furcular deposit. For that, the neck is stretched only slightly (and not backwards) so that the furcular deposit is well visible, and the feathers are blown aside. Second, check the abdominal deposit. To do so, the legs of the bird are spread aside (do not pull the legs up or down, because this will affect the position of the fat deposits!) and the feathers blown aside.

Score each of the two fat deposits according to the simplified fat classes shown below. If the two independent fat scores for the furcular and abdominal fat deposits do not coincide, take the mean and round to integer values.

Fat score classes 0 - 8

Fat deposits are indicated in black



Scoring the furcular deposit

Scoring the abdominal deposit

No fat



0



No fat

Small linear or triangular fat deposit at the bottom of the



1



Traces of fat in small pit patches or stripes

Scoring the furcular deposit

Scoring the abdominal deposit

Furcular depression almost filled with fat, concave



2



Flat fat pad, at least one intestinal loop visible

Bottom of furcular depression completely filled, deeply concave



3



Area between intestinal loops filled with fat

Furcular depression filled with fat, flat



4



Fat pad bulging (2-4mm), liver sometimes still visible

Furcular depression filled, bulging, spreading over muscle



5



Fat pad strongly bulging, no viscera visible

Fat covers breast muscle by several mm



6



Fat covers breast muscle by several mm

3/4 of breast muscle covered with fat



7



Ventral side completely covered with fat, no breast muscle visible



8





Muscle score

Beside fat which is the primary energy source during endurance exercise and fasting, muscle protein is also used. The size of the breast muscles is a further valuable indicator of body condition, especially in birds with low fat stores.

In birds whose flight muscles are not covered with fat, the shape of the breast muscles can be easily scored visually and by sweeping your finger over the sternum. See the instructions for fat scoring for the place where to determine muscle score.

Muscle score classes 0 - 3

The figures show a cross-section of the body of a bird approximately half way along the breast muscles. The breast muscle is indicated in black.

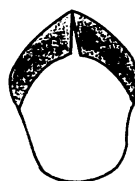
Score 0
sternum sharp,
muscles depressed



Score 1
sternum easy to discern,
but not sharp,
muscles neither depressed
nor rounded



Score 2
sternum yet distinguishable,
muscles slightly rounded



Score 3
sternum difficult to distinguish
due to rounded (full) muscles





Moult recording

See "Sexing and ageing" for an overview about the moult of the Swallow.

Moult of body feathers

In Swallows in autumn, it is rather difficult to distinguish between juvenile and replaced body feathers in all parts of the body. Therefore, it is recommended to record only the intensity of body feather moult. In birds in the winter quarters, however, it may be more easy to record the progress of body feather moult.

Moult intensity of body feathers

Examine the bird for growing body feathers (without considering feathers of head, wings and legs) with a single quick blow each on the upper- and underparts.

- 0 = No body feathers growing.
- 1 = A few body feathers growing: up to about 20 growing feathers.
- 2 = Many body feathers growing (more than about 20). This includes feathers growing due to the completion of the juvenile plumage in birds just after fledging.

Progress of body feather moult

In Swallows in autumn, it is rather difficult to distinguish between juvenile and replaced body feathers in all parts of the body.

- J = Juvenile bird just fledged, primaries still growing.
 - U = Body feathers mainly unmoulted old (juvenile plumage): less than one third of the body feathers moulted.
 - M = Between one third and two third of the body feathers moulted.
 - N = Body feathers mainly moulted: more than two thirds of the body feathers renewed.
- Leave blank if undecided.

Complete moult and moult of primaries

In autumn, some adults and a few first-year birds start moult of primaries in Europe. Hence, it is important to record the stage of growth for each of the renewed primaries. Because primary moult starts with the innermost, check carefully for innermost growing or missing primaries. Use the following conventional scores for each flight feather:

- 0 = Old
- 1 = Feather missing or in pin
- 2 = Feather just emerging from sheath or up to 1/3 grown
- 3 = Feather between 1/3 and 2/3 grown
- 4 = Feather > 2/3 grown, but still not full grown or with trace of sheath remaining at base
- 5 = Feather full grown

After Bairlein (1995, ESF-Network Field Manual)

In the winter quarters during the complete moult, moult cards should be filled in. Moult cards as shown below can be obtained from: Schweizerische Vogelwarte, CH - 6204 Sempach, Switzerland.

Moult card

Species code	Species	Sex	Age	Ring number	Retrap no <input type="checkbox"/> yes <input type="checkbox"/>	Ringer																									
Day, month, year		Locality		Coordinates	Country, district																										
Feather length	Weight	Fat score	Pneumatization Score: <input type="checkbox"/> or: <input type="checkbox"/> <small>not fully grown</small> <input type="checkbox"/> <small>fully grown</small>	Comments																											
Left wing				Right wing																											
Alula		Carpal covert		Marginal coverts		Carpal covert																									
3 2 1		Solid <input type="checkbox"/> New <input type="checkbox"/> Growing <input type="checkbox"/>		Solid <input type="checkbox"/> New <input type="checkbox"/> Growing <input type="checkbox"/>		Solid <input type="checkbox"/> New <input type="checkbox"/> Growing <input type="checkbox"/>																									
Median coverts		Median coverts		Median coverts		Median coverts																									
Solid <input type="checkbox"/> New <input type="checkbox"/> Growing <input type="checkbox"/>		Solid <input type="checkbox"/> New <input type="checkbox"/> Growing <input type="checkbox"/>		Solid <input type="checkbox"/> New <input type="checkbox"/> Growing <input type="checkbox"/>		Solid <input type="checkbox"/> New <input type="checkbox"/> Growing <input type="checkbox"/>																									
Primary Coverts		Greater Coverts		Greater Coverts		Primary Coverts																									
9 8 7 6 5 4 3 2 1		1 2 3 4 5 6 7 8 9 10		10 9 8 7 6 5 4 3 2 1		1 2 3 4 5 6 7 8 9																									
Primaries		Secondaries		Tertials		Primaries																									
10 9 8 7 6 5 4 3 2 1		1 2 3 4 5 6 7 8 9		8 7 6 5 4 3 2 1		10 9 8 7 6 5 4 3 2 1																									
Comments				Moult of body feathers																											
				<table border="1"> <thead> <tr> <th></th> <th>% old</th> <th>% new</th> <th>% growing</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>Head</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Upper parts</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Under parts</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Tail coverts</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				% old	% new	% growing	%	Head					Upper parts					Under parts					Tail coverts				
	% old	% new	% growing	%																											
Head																															
Upper parts																															
Under parts																															
Tail coverts																															
Tail feathers		Tail feathers																													
6 5 4 3 2 1		1 2 3 4 5 6																													

Reverse of moult card

SCHWEIZERISCHE VOGELWARTE
NATURAL HISTORY MUSEUM
 CH - 6204 Sempach, Switzerland

NATURHISTORISCHES MUSEUM
NATURAL HISTORY MUSEUM
 CH - 4001 Basel, Switzerland

Instructions
 This moult card serves for passerines and schematically shows both wings. For general use, fill in moult cards for every bird of the following categories:
In summer/autumn: All adults during moult and all adults after moult which renewed only part of the plumage; all first-year birds with growing or renewed secondaries or primaries. *In winter/spring:* All birds in active moult of primaries, secondaries, tertials, rectrices or greater coverts; all birds after moult with renewed secondaries or primaries.
 If possible, record all feathers, but data for certain feather tracts only (e.g. primaries and secondaries) are welcome as well. Please return cards to one of the addresses above.

General information (first three lines)
 Sex, Age: Preferably, use EURING codes.
 Feather length, weight, fat score: This is optional on ringing stations where this information is recorded on the ringing lists.
 Skull pneumatization: This is an important additional information. Give either the score (after Jenni & Winkler 1994) or tick the appropriate box.

Moult data
 Always fill in one side (wing and tail) completely. If time allows, complete both sides, especially if they are different or deviate from 'normal' moult patterns. If you hold the bird with the head towards you, you might turn the moult card. Write codes into the white feather boxes. Use horizontal lines to indicate that the same code applies for a series of feathers.
 Give the approximate percentage of old, new and growing feathers for body feathers, marginal ('lesser') and median coverts. If body feathers are composed of three generations, the additional column may be used (explanations in the comments section).

Codes: The aim is to assign each feather to the moult when it has been grown. Codes 0 - 5 are the same as those used for the BTO moult card.

- 0 Old.
- 1 Feather missing or in pin.
- 2 Feather just emerging from sheath or up to 1/3 grown.
- 3 Feather between 1/3 and 2/3 grown.
- 4 Feather > 2/3 grown, but still not full grown or with trace of sheath remaining at base.
- 5 Renewed in summer/autumn in the breeding range (postbreeding/postjuvenile moult).
- 6 Renewed after autumn migration during (late autumn) winter/spring ('prebreeding' moult).
- 7 *In winter/spring:* Older than 6, either 0 or 5. This code may be used in winter/spring for feathers which appear much older than 6, but for which it is uncertain whether they have been acquired during the postjuvenile/postbreeding moult or earlier.
In summer/autumn: Older than 0. This code may be used in late summer/autumn for feathers which have been retained during the previous prebreeding moult (e.g. adult *Muscicapa striata*, *Oriolus oriolus*).
- 8 Older than 6, either 5 or 'early 6'. This code may be used in winter/spring for feathers which appear somewhat older than 6, but for which it is uncertain whether they have been acquired during the postbreeding/postjuvenile moult before autumn migration or during an early 'prebreeding' moult in late autumn/winter.
- 9 Impossible to assign.



Data transfer and contacts

Data transfer

General

Ringing schemes (or groups of ringers) are asked to send:

- the summary sheets of the breeding and roosting period to Fernando Spina (see above) at the end of each season.
- computerized files to the EURING co-ordinators. Data on breeding biology should be sent to Luc Schifferli and Hannes von Hirschheydt, data on migration and roosts should be sent to Fernando Spina.
- paper copies of all nest record forms, to be sent to Luc Schifferli and Hannes von Hirschheydt.
- a computerized list of addresses of all ringers and volunteers involved in this project to Fernando Spina. The file should be in ASCII, dBase or Access and contain the name, first name, home address (street and number), postal code, place and country, all in different fields (6 fields).

Computer files

You may use your own software to record the data. However, when sending the data to the co-ordinators, send the data on MS-DOS diskettes and in one of the following formats: EXCEL, ACCESS, Dbase III or Dbase IV for MS DOS or an ASCII file. ASCII files are to be preferred because they limit the transfer of computer viruses. If you use Dbase, define fields as „character“ (not „number“) if the variable may be 0 (e.g. fat and muscle score). It is planned to distribute a computer software to record all data of the Swallow project, to be used by ringing schemes and ringers. We recommend to send 8 different kinds of files:

- A file containing the information of the "Summary sheet on breeding biology". Please code the 'type of building' with consecutive numbers and join a list of codes (e.g. 1 = barn, 2 = stable with cows, 3 = stable with pigs, etc). Do not enter the totals at the bottom of the sheet.

- A file containing the information of the first and last part of the "Nest record form": Year, study area, (farm), building and nest number, description of nest situation, size of room, position, type, age, support and back of nest, as well as the 11 key data on breeding biology. Please code the various categories with the numbers indicated in front of the boxes and join a list of codes if you alter these codes.
The information of the middle part of the nest record form (the day by day notes) are not entered in computer files, but send all nest record forms (on paper) to the co-ordinator.
- A file containing the information of the "Ringing list for breeding period".
- A file containing the information of the "List of retraps and controls of breeding period". Please code the ringing scheme with the three-letter EURING code.
- A file containing the information of the first part of the "Roost description and summary sheet": 'Description of the roost'. Please code the vegetation, water on ground, extent of vegetation, inter- and intraseasonal use of the roost with the numbers indicated in front of the boxes and join a list of codes if you alter them.
- A file containing the information of the second part of the "Roost description and summary sheet": 'Ringing activities'. Please code the estimated number of Hirundines attending the roost with the numbers indicated in front of the boxes.
- A file containing the information of the "Ringing list for roosts".
- A file containing the information of the "List of retraps and controls in roosts". Please code the ringing scheme with the three-letter EURING code.

Important: Please make sure that all files are accompanied with a clear explanation of its structure and contents (particularly for ASCII files). Please mention any deviations from the instructions given in this manual (e.g. adding or omitting certain categories).

Contacts and addresses

Please contact Fernando Spina, Arie van Noordwijk, Luc Schifferli or Hannes von Hirschheydt for specific questions of the project. Summary sheets of the breeding and roosting period should be sent to Fernando Spina. Data on breeding biology should be sent to Luc Schifferli and Hannes von Hirschheydt, data on migration and roosts should be sent to Fernando Spina.

Dr. Luc Schifferli and Hannes von Hirschheydt
Swiss Ornithological Institute
Schweizerische Vogelwarte
CH - 6204 Sempach, Switzerland
e-mail: schifferli@orninst.ch
Fax: +41-41-462 97 10

Dr. Fernando Spina
Istituto Nazionale per la Fauna Selvatica
Via Ca' Fornacetta 9
I - 40064 Ozzano Emilia (BO), Italy
e-mail: nfsmigr@iperbole.bologna.it
Fax: +39-51-79 66 28

Further copies of this Field Manual on paper or files (the text in Word 6.0, the forms in Excel 5.0) can be obtained from Lukas Jenni. Rulers with pins for measuring feather-length (SFr. 15.50 per piece; only small numbers available at once) and moult cards can also be obtained from Lukas Jenni.

Dr. Lukas Jenni
Schweizerische Vogelwarte
Swiss Ornithological Institute
CH-6204 Sempach, Switzerland
e-mail: jennil@orninst.ch
Fax: +41-41-462 97 10



Examples of data forms

This chapter presents examples of data forms which were developed for Swallow projects in Switzerland and Italy.

The ringing schemes are of course free to adapt and modify these forms according to their standards or use their own existing forms; they only serve as examples.

Summary sheet on breeding biology



Observer..... Study area..... Country..... Year.....

(Farm and) Building No.	Co-ordinates	Type of building	Number of Swallow nests				Number ringed			Nb. of retraps + controls	Additional data, comments
			total		occupied		nest-lings	fledg-lings	adults		
			natural	artificial	natural	artificial					
Total											

Building No.: For each study area, number consecutively and unambiguously: 01, 02, 03,

Type of building: Dwelling-house, farm building, industrial building, garage/hangar, open shelter, bridge, boat-house, other

Occupied nests: Occupied by Swallow. At least one Swallow egg in the nest **Nb. fledglings ringed:** Nb. ringed at breeding site, but not assignable to a nest

Nest record form



Use a separate nest record form for each brood/breeding attempt

Observer..... Country: Year.....

Study area..... (Farm and) building and nest no:...../.....

Description of nest situation Date:.....		Size of room mean length m mean width m mean height m
1 <input type="checkbox"/> in Stable: main livestock..... 2 <input type="checkbox"/> in barn 3 <input type="checkbox"/> in dwelling room: inhabited 4 <input type="checkbox"/> non inhabited 5 <input type="checkbox"/> in garage 6 <input type="checkbox"/> in cellar	7 <input type="checkbox"/> in loft 8 <input type="checkbox"/> at outside wall of any building 9 <input type="checkbox"/> passage 10 <input type="checkbox"/> open shelter 11 <input type="checkbox"/> other:	

Position of nest From ground cm From ceiling cm	Age of nest 1 <input type="checkbox"/> unknown 2 <input type="checkbox"/> of this year 3 <input type="checkbox"/> older than this year 4 <input type="checkbox"/> built in year	Support of nest 1 <input type="checkbox"/> none 2 <input type="checkbox"/> board 3 <input type="checkbox"/> lamp 4 <input type="checkbox"/> wire 5 <input type="checkbox"/> other:.....	Back of nest 1 <input type="checkbox"/> wood 2 <input type="checkbox"/> brick 3 <input type="checkbox"/> concrete 4 <input type="checkbox"/> steal 5 <input type="checkbox"/> other:.....
Type of nest <input type="checkbox"/> natural <input type="checkbox"/> artificial			

Date	Hour	Nest (tick box)			Number of adults		Number of		Age of nestlings (days)	Egg and nestling losses and causes Comments
		suit-able	unsuit-able	occu-pied*	in nest	near nest	intact eggs	living nestlings		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						

Condition of the nest: suitable or unsuitable for breeding, *occupied by another species (details under comments)

Age of nestlings: see separate instructions

Summary of breeding data: Please follow carefully the instructions given separately

Breeding success	min.	max.	Breeding attempt	1 <input type="checkbox"/> First	2 <input type="checkbox"/> Second	3 <input type="checkbox"/> Third	9 <input type="checkbox"/> Unknown		
Nb of eggs:			Observations	Number of visits with egg/nestling <input type="text"/>	Breeding dates				
Nb unhatched eggs					Start of egg-laying date				±
Nb of nestlings:					First date max. eggs/nestlings				±
Nb of fledglings			Last date before fledging				Fledging date	±	

Comments:

Ringing list for breeding period



Study area.....

Country:

Year

Name(s) of ringer(s)/code or initials:

Ring number	Day	Month	Time (hour)	B P	S	A	Age of N	Number of building-nest	Scores F M	Feather-length (0.5 mm)	Length of tail-feathers (0.5 mm)			Body weight (0.1 g)	Ringer-code or initials	Comments
											innermost longest	outermost left	outermost right			
	1															
	2															
	3															
	4															
	5															
	6															
	7															
	8															
	9															
	0															
	1															
	2															
	3															
	4															
	5															
	6															
	7															
	8															
	9															
	0															
	1															
	2															
	3															
	4															
	5															
	6															
	7															
	8															
	9															
	0															

Use this list only for *Hirundo rustica*. For **nestlings** use white columns only, for **adults** fill-in all columns.

For **fledglings** use white columns, F+M-scores and feather-length.

BP = Brood patch

- no BP 0
- indistinct BP 1
- distinct BP 2

S = Sex

- undetermined 0
- male 1
- female 2

A = Age

- first-year 3
- after first-year (adult) 4

Age of N (nestlings): estimate to one day

Feather-length: Feather-length of the third outermost primary (see separate instructions)

Score F: Fat score: 9-grade score (see separate instructions)

Score M: Breast muscle score: 4-grade score (see separate instructions)

Comments:

.....

.....

Ringling list for Swallow roosts



Locality: Country: Year

Ringer: Ringer-No.

Ring number				Day	Month	Hour of weighing	B P	S	A	Feather-length (0.5 mm)	Tail-fork (0.5 mm)	Scores		Moult			Body weight (0.1 g)	Comments		
												F	M	B M	P					
															1	2	3			
				1																
				2																
				3																
				4																
				5																
				6																
				7																
				8																
				9																
				0																
				1																
				2																
				3																
				4																
				5																
				6																
				7																
				8																
				9																
				0																
				1																
				2																
				3																
				4																
				5																
				6																
				7																
				8																
				9																
				0																

Use this list only for *Hirundo rustica*. For first-year birds use white columns only, for adults fill-in all columns.

Hour of weighing: Hour of actually weighing the birds (to one hour precision)

BP = Brood patch

no BP 0
 indistinct BP 1
 distinct BP 2

S = Sex

undetermined 0
 male 1
 female 2

A = Age

undetermined 2
 first-year 3
 after first-year (adult) 4

Feather-length: Feather-length of the third outermost primary (see separate instructions)

Tail-fork: Distance between the tips of the innermost and outermost tail-feather

Score F: Fat score: 9-grade score (see separate instructions)

Score M: Breast muscle score: 4-grade score (see separate instructions)

Moult: BM = Body moult intensity

no body feathers growing 0
 a few (<20) body feathers growing 1
 many (>20) body feathers growing 2

Moult: P = Moult of primaries

(if more than the 3 innermost primaries in moult, indicate remainder as comments)

old 0 between 1/3 and 2/3 grown 3
 missing or in pin 1 > 2/3 grown 4
 < 1/3 grown 2 renewed, full-grown 5

