

EURING Exchange Code 2020



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based on the EURING Exchange Code 2000, Speek, G., Clark, J.A., Rohde, Z., Wassenaar, R.D. & Van Noordwijk, A.J.

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<https://euring.org/data-and-codes/euring-codes>

Previous EURING code manuals, *EURING Code Manual* (1966), *Code Manual New EURING* (1979), *EURING Exchange Code 2000* and *EURING Exchange Code 2000+* can also be downloaded from this website together with various other documents detailing developments between these manuals.

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1 FOREWORD

EURING, the European Union for Bird Ringing, was founded in 1963 for the purpose of promoting and facilitating co-operation between the European ringing schemes. One of its first and most difficult tasks was to agree a code whereby ringing recoveries could be committed to punch cards, and by the end of 1966 the '*EURING Code Manual*' was issued. This was a very forward-looking operation, carried out at a time when few ringing centres had access to computing machinery and when the power and availability of computers we have now could not have been envisaged. Ringing schemes owe a great debt of gratitude to the team which worked for this first EURING code.

In 1977, during a meeting of EURING in Sopot, Poland, the decision was taken to compile a new code, more suited to new computer requirements and facilities. The initiative for this new code was taken by Dr. Carl Edelstam. A working party consisting of Dr. P. Busse, B. Jacquat, C.J. Mead and B.J. Speek was entrusted with the task of finalizing the new version of the code. In 1979 the '*Code Manual New EURING*' was ready for use and was presented by Robert Spencer, the General Secretary of EURING. The 1979 code -- produced with the benefits of both hindsight and improved technology has proved remarkably robust -- over 30 years later it was still in use by some schemes.

A further revision of the code was suggested by Pertti Saurola at the EURING Board meeting in 1997. A committee (of Jacquie Clark, Pertti Saurola and Rinse Wassenaar) was set up to work on the new code. In 1998 Gerrit Speek became involved in the project and produced a first draft of the new code '*EURING exchange-code 2000*'. The code was circulated to the committee between December 1998 and February 1999, and was sent to all ringing centres in April 1999 before being presented and adopted formally during the EURING General Meeting in September 1999 on Helgoland. During that meeting a committee consisting of Jacquie Clark (Britain & Ireland Ringing Centre), Zenon Rohde (Poland Ringing Centre), Gerrit Speek (Dutch Ringing Centre) and Rinse Wassenaar (EURING databank) was entrusted with the task of finalising the new version of the code.

By this time technological developments allowed much more space for storage and easier handling of data. Although the new code relied heavily on the former 1979 code, keeping as many codes as possible unchanged, there were two major developments. First was the separation of the different encounters of birds into different records. In 1979 code, each record held details of both the ringing and recovery event for one individual. In 2000 code, these two events each had a separate record. One benefit of this was that birds with many subsequent reports did not have the initial ringing details repeated for each subsequent encounter record. This also set the precedent for regarding the bird encounter as the basic unit of ringing information and paved the way for storage of any ringing data, rather than just records of birds which had a recapture history. The second development was that space was reserved for biometric information -- although at that stage no biometric variables were defined.

The purpose of adding biometric fields to the EURING coding scheme is to allow schemes to store such data in a standard format which will allow simpler data exchange. It is important to stress that it is not expected that all schemes are expected to collect all these data for all birds. Rather, the coding system allows data to be stored where schemes already collect such data. Schemes are encouraged to gather appropriate data systematically but should not feel forced to try to collect all possible data for all birds.

At the 2009 EURING General Meeting in Anversa, Italy, it was agreed to enhance the EURING2000 code and a draft was presented and discussed. The meeting agreed to allow the Data Management Committee to take final decisions on the code. This enhanced code, again, represents considerable advances on the earlier code whilst, at the same time, maintaining as much continuity as possible with its parent code. The first development was to move to a separated format in place of the former fixed-field-width format (e.g. pipe delimited file with .psv file ending). This separated format is now more familiar to many users and much easier to handle than fixed-width formats. The second major change was that it was agreed that the EURING Data Bank could, in future, store ringing data for all bird encounters -- not just for birds with a recapture history. This will make all ringing data available, eventually, to analysts. This unlocked the potential created in the 2000 code.

At the board meeting in Sofia in 2015 it was agreed to combine various supplementary documents, including

protocols for data exchange, data submission and ringing totals, as chapters within the manual rather than as stand-alone documents and the updated document was released in that year.

The arrival of the twenty-first century heralded the beginning of very great changes in bird taxonomy. Up to that point the EURING species codes had performed two separate functions – identifying the species and giving the taxonomic order. This latter function had been decreasingly effective because of the additions of many new species which, at the time of the code definitions in 1979, had not been ringed by European ringing schemes. Such new species had been issued with codes which had to be out of taxonomic order. The problem was discussed at the 2017 General Meeting in Helsinki. It became clear that trying to maintain the two functions of the species code would lead to continuous changes in the species code for many years to come. On the other hand, waiting for eventual stability in taxonomy before revising the coding system would make the present codes increasingly outdated. The Data Management Committee was entrusted to produce a resolution. The solution, agreed by the board in October 2020 was to separate the two functions of the species code. Codes will remain the same, although nomenclature will be updated. The taxonomic order will be freely available via a link on the EURING web site and this order will be updated as required. An important aspect of this approach is that schemes will have to make no changes at all to existing records; some future records will need to be coded differently where subspecies have been elevated to full species.

Another recent change is that has become much more common to express co-ordinates as degrees with decimal points rather than in degrees, minutes and seconds. Two new fields, Latitude and Longitude, have been defined which can be used in place of the increasingly awkward format of the existing co-ordinates field. Some other changes including Other Marks and Place Codes have been made to minimise disruption to schemes' existing procedures as far as possible whilst at the same time making provision for future technological developments. The section which held bat and sea mammal codes has now been removed. For those who use them they will find the codes still in previous versions of the manual which are on the web site. EURING will no longer define any codes for these non-avian species.

Although changes from 2000+ code to 2020 may appear negligible, indeed schemes can submit data in 2020 code without making any immediate changes to their systems, the code does overcome major obstacles which have developed in recent years. It has thus been agreed to name it code 2020.

Thanks are due to the many people who have assisted in the development of this code and its predecessors.

Chris du Feu (Chair: EURING Data Management Committee)

Relationship between 2000+ and 2020 codes

The enhancements of 2020 code are arranged so that all the 2000+ fields remain as they are and in the same sequence. This allows schemes to develop their systems when time and resources allow. Data may be submitted to the EDB in either 2000+ or 2020 code. Conversions, for example between co-ordinates and longitude/latitude, can be done automatically when data are loaded in the EDB.

Species codes remain unchanged although nomenclature is updated. Only four new fields have been defined and an alternative set of codes defined for one existing field (Accuracy of Co-ordinates). Schemes may now give location either as the traditional co-ordinates or else as longitude and latitude separately. Eventually just longitude and latitude will be held in the EDB. Alongside these two fields an alternative alphabetical scale of co-ordinate accuracy has been defined.

A problem with the place code field became increasingly apparent during work on the Eurasian African Bird Migration Atlas. Boundaries of regions change from time to time. Problems arise when checking co-ordinates from polygon files or look-up tables if the place code used does not match the validation data. Selection of records by place code may also be unreliable when changes have taken place. For this reason the existing Place Code field will now hold the place code at the time of the bird encounter. Once given it should never be changed. The new code – Current Place Code – can be amended when there are administrative boundary changes. It is appreciated that there has been considerable variation in schemes' approaches to coding places after boundary changes. This new code should help to reduce that problem.

There is a new field to hold information for encounters of birds with more than one additional mark.

2 SUMMARY OF FIELDS AND ENCODING

A file holding data in EURING2000, EURING2000+ or EURING2020 format must use UTF-8 or ASCII encoding. UTF-8 is the preferred choice. Note that using pure ASCII encoding is only possible if Text fields contain no data that use non-ASCII characters (such as ß, ã, ê).

There are five different types of fields in this coding scheme. These are:

| | |
|--------------|--|
| Alphabetic | Upper case letters of the 26-letter Roman alphabet (A-Z), and the minus sign (-). |
| Alphanumeric | Upper case letters drawn from the 26-letter Roman alphabet (A-Z), the 10 digits (0-9), the minus sign (-) the plus sign (+) and the dot (.). |
| Integer | A non-negative whole number. Valid characters are the 10 digits (0-9), and the minus sign (-). Fixed-length fields require leading zeroes. Minus signs are only valid if the entire field is filled with them; in these cases the field value is unknown, not relevant to the record or not computable. |
| Numeric | A non-negative number, which may have a decimal point. Valid characters are the 10 digits (0-9) and the dot (.). The dot, if used, is the decimal point separator and can only occur, at most, once. It must never be the last character. Fields with numeric codes only occur in field which are not of fixed length. If the value is not recorded or unknown then the field is left empty. |
| Text | A text field consisting of any combination of Unicode characters except codes 0 – 31 inclusive, code 124 (the pipe character ' ') and code 127 (control character 'delete'). |

Where the number of characters in a field is fixed, the field length is given. In other cases the field may have as many, or as few, characters as required.

Note that the fields up-to-and-including Derived data – elapsed time must have a code, even if that code stands for 'not recorded' or 'unknown'. Fields from Wing length onwards will be represented as a null character where they are not recorded. Fields marked with ** have important changes from code 2000+ or are new fields.

| Field | Type | Notes | Page |
|------------------------------------|--------------|-------------------------------|------|
| Ringling Scheme | Alphabetic | 3 letters | 6 |
| Primary Identification Method | Alphanumeric | 2 characters | 6 |
| Identification Number (ring) | Alphanumeric | 10 characters | 7 |
| Verification of the Metal Ring | Integer | 1 digit | 8 |
| Metal Ring Information | Integer | 1 digit | 8 |
| ** Other Marks Information | Alphabetic | 2 letters | 9 |
| ** Species Mentioned | Integer | 5 digits, includes subspecies | 10 |
| ** Species Concluded | Integer | 5 digits, includes subspecies | 11 |
| Manipulated | Alphabetic | 1 letter | 11 |
| Moved Before Recovery | Integer | 1 digit | 12 |
| Catching Method | Alphabetic | 1 letter | 12 |
| Catching Lures | Alphabetic | 1 letter | 13 |
| Sex Mentioned | Alphabetic | 1 letter | 13 |
| Sex Concluded | Alphabetic | 1 letter | 13 |
| Age Mentioned | Alphanumeric | 1 character | 14 |
| Age Concluded | Alphanumeric | 1 character | 15 |
| Status | Alphabetic | 1 letter | 16 |
| Brood Size | Integer | 2 digits | 16 |
| Pullus Age | Integer | 2 characters | 17 |
| Accuracy of Pullus Age | Alphanumeric | 1 character | 17 |
| Date | Integer | 8 digits | 18 |
| Accuracy of Date | Integer | 1 digit | 18 |
| Time | Alphanumeric | 4 characters | 19 |
| **Place Code(at time of encounter) | Alphanumeric | 4 characters | 20 |
| **Geographical Co-ordinates | Alphanumeric | 15 characters | 21 |
| **Accuracy of Co-ordinates | Integer | 1 digit | 22 |
| Condition | Integer | 1 digit | 23 |
| Circumstances | Integer | 2 digits | 24 |
| Circumstances Presumed | Integer | 1 digit | 24 |
| EURING Code Identifier | Integer | 1 digit | 25 |
| Derived data – Distance | Integer | maximum 5 digits | 25 |
| Derived data – Direction | Integer | 3 digits with leading zeros | 26 |

3 CODES AND DESCRIPTIONS

Ringling Scheme

alphabetic, three characters

The full list of codes can be downloaded or accessed interactively at:

www.euring.org/data_and_codes/euring_code_list/index.html

This list also includes the scheme status – EURING/non-EURING and Current/Extinct.

Ringling schemes are here defined as centres issuing rings with alphanumeric ring numbers which, without the specific address, could be confused with rings of other centres. This means that a ring number is only internationally unique as a combination of the fields **Ringling Scheme** and **Ring number**.

The initial two letters are the country letters from the **Place Code**: see that section for further explanation. The final letter indicates the scheme.

To avoid using code letters on some extinct, very small or private schemes as well as zoos and avicultural societies, such rings are coded with the first two letters of the main scheme from their country of origin with the third letter X.

| | |
|--------------------------|-----|
| e.g. Mortensen (Denmark) | DKX |
| e.g. Crampton (England) | GBX |

Details about these extinct and private schemes can be obtained from the relevant national schemes.

Primary Identification Method

alphanumeric, two characters

This field is to denote the primary method used to identify a bird. **Where a metal ring is present, this will always be the primary identification method, regardless of what other marks are placed on the bird.** With the development of new technology it is likely that, in the future, some birds may be marked by other methods (e.g. transponders) and will not have metal rings attached. This field anticipates that future need. At present, the primary identification marker will almost invariably be a metal ring.

When a bird is only marked with a method other than the metal ring (primary identification method not A0), and on a next catch a metal ring is added, the primary identification method must be changed to A0 and also on previous records of this bird.

The code in this field will be the same on any capture of a bird. It will not change if a secondary marker is added to a bird. It is essential that a bird is identified by the same method and number throughout its life.

Reringed birds. At present, if a bird is re-ringed, the number of the first ring is retained as the bird's identifier. This allows any record for an individual to be linked together easily. In the same way if, in the future, the primary identifier is changed, that bird will continue to be identified by the first identifier it had.

| | |
|----|--|
| A0 | Metal ring. |
| B0 | Coloured or numbered leg ring(s). |
| C0 | Coloured or numbered neck ring(s). |
| D0 | Wing tags. |
| E0 | Radio tracking device. |
| F0 | Satellite tracking device. |
| G0 | Transponder. |
| H0 | Nasal mark(s). |
| K0 | GPS loggers. |
| L0 | Geolocator loggers (recording daylight). |
| R0 | Flight feather(s) stamped with a number. |
| T0 | Body or wing painting or bleaching. |

Identification Number (ring)

alphanumeric, ten characters

A sequence of ten characters, to be coded directly. Although this sequence of characters generally includes some letters, it is still commonly referred to as the ring 'number'. Where a ring number consists of fewer than ten characters, this field is padded with dots. **These dots are always inserted to the left of the rightmost row of numbers.** The table below gives examples.

| Identification number | | Number | Formatted |
|---------------------------------------|--|-------------------------------|--|
| All numbers | Right adjusted. | 12345 01234567 |12345 ..01234567 |
| Letters / numbers | Letters left adjusted. Numbers right adjusted. | A1234 AB6789 ABC1234567 | A.....1234 AB....6789 ABC1234567 |
| Numbers / letters / numbers | Letters and preceding numbers left adjusted. Other numbers right adjusted. | 1A2345 23E456 1AB4567 | 1A....2345 23E....456 1AB...4567 |
| Numbers / letters | Right adjusted. | 12345X 56789AB |12345X ...56789AB |
| Letters / numbers / letters / numbers | Always insert the dots left of the rightmost row of numbers. | B1A2345 F234Z567 | B1A...2345 F234Z..567 |

The figure 0 (zero) must be entered where, and only where, it appears on a ring number. Thus 123456 must be given as123456 and 0 123456 as ...0123456

When part of the ring number is unknown (worn ring, incomplete number reported etc.) the missing parts of the ring number are to be entered as '-'. Thus if the 5 has worn from a ring AB12 345 (or the number is covered by an overlap) it should be coded as AB...1234-

Every recovery of any individual bird should **always** have the original ring number placed on that bird as the number coded here. This applies through all subsequent replacements of the ring, whether by the scheme originally ringing the bird or by any other scheme.

If a metal ring is added on first capture the identification number will always be that metal ring number.

If a bird is not metal-ringed on first capture but is identified in another way (primary identification method not A0), a number relating to that bird must be entered in this field. That unique number will represent a not-present-metal-ring-number. It must be a unique number because this identification number is unique for database reasons. That unique number must be allocated by the national scheme. It is recommended to start that unique number with the characters "NMR" (meaning "not metal ring") and then followed by seven numbers. For example: NMR0000001. It is recommended that the Scheme and ringer agree this unique number that will be used to identify the bird throughout its life.

Verification of the Metal Ring

integer, one digit

- 0 Ring **not** verified by scheme.
- 1 Ring verified by scheme.
- 9 Unknown if ring verified by scheme.

On the ringing encounter, always code this field as: 0 – Ring not verified by the scheme.

Ring verification may be by the ring being sent or a photograph, photocopy, rubbing or carbon copy being available. Records should also be marked as verified if the ring has been seen by the ringing scheme but subsequently returned to the finder.

Metal Ring Information

integer, one digit

- 0 Metal ring is **not present**.
- 1 Metal ring **added** (where no metal ring was present), position (on tarsus or above) unknown or unrecorded.
- 2 Metal ring **added** (where no metal ring was present), definitely on tarsus.
- 3 Metal ring **added** (where no metal ring was present), definitely above tarsus.
- 4 Metal ring is **already present**.
- 5 Metal ring **changed**.
- 6 Metal ring **removed** and bird released alive (use code 4 if bird was dead).
- 7 Metal ring **added, where a metal ring was already present**. N.b. within EURING there is an explicit agreement that ringers must not add a metal ring when one is already present (except in circumstances where the existing ring needs to be replaced because of wear).

Other Marks Information (not a conventional metal ring)

alphabetic, 2 characters

This gives information about any other marks associated with the bird. There are five 2-letter codes which are special cases (although most encounter records will have the special case ZZ – no marks other than metal ring.) For all other codes, the first character gives the type of mark and the second gives the state of this marking.

Where two or more marks have been used, then one of the special case codes must be used. The codes for these marks can then be entered in the **More Other Marks** field

First character:

Permanent marks:

- B Coloured or numbered leg-ring(s) or flags.
- C Coloured or numbered neck-ring(s).
- D Coloured or numbered wing tag(s).
- E Radio-tracking device.
- F Satellite-tracking device.
- G Transponder.
- H Nasal mark(s).
- K GPS logger.
- L Geolocator logger (recording daylight).

Temporary marks:

- R Flight feathers stamped with the ring number.
- S Tape on the ring.
- T Dye mark (some part of plumage dyed, painted or bleached).

Second character:

- B Mark added.
- C Mark already present.
- D Mark removed.
- E Mark changed.
- Unknown.

Special cases:

- MM More than one mark added/present/removed.
- OM Other mark(s) present.
- OP Other permanent mark(s) present.
- OT Other temporary mark(s) present.
- ZZ No other marks present or not known to be present.

Examples:

- BB Coloured or numbered leg-ring fitted to bird.
- DC Coloured or numbered wing tags on the bird when it was encountered.
- GD Transponder removed from bird.
- LE Geolocator logger changed.
- SE Tape on ring changed.
- T- Dye mark – unknown if it was already present, removed, added or changed at this encounter.

Additional information about marks (e.g. colour combinations) can be added in the **Remarks** field if this is required by the scheme during recovery processing. Details of colour marks are not stored in the EDB.

Species and Subspecies as **Mentioned** by the person who handled the bird.

integer, five digits

A five digit code which specifies the species, or subspecies, uniquely.

The full list of codes can be downloaded or accessed interactively at:

www.euring.org/data_and_codes/euring_code_list/index.html

This field is for the species as reported by the finder, whether or not he has correctly identified the species. If the species is reported as 'unknown bird' or similar, use the code 00 000. If it is reported as a member of a group 'gull', 'duck' etc., use the appropriate code ending in the digit 9. The full, correct species code will be given in the next field, **Species as concluded by the scheme**. Where a bird has been incompletely, or incorrectly, identified by the finder, these two species codes will then be different.

The numeric code for species was originally derived from sequential numbering of *List of Recent Holarctic Bird Species*, (Voous K.H. 1977). Published for The British Ornithologists' Union by Academic Press. Recent and anticipated taxonomic changes and newly encountered species now make it impossible to retain a stable species code list which serves both to identify the species and give taxonomic order. The existing species codes are therefore maintained but the, ever-changing, taxonomic order can be found in a table on the Data and Codes web pages. This table will be updated as required by the BTO and is based on the IOC taxonomy.

Almost all species codes remain exactly as they have been. The few exceptions include former subspecies now elevated to species level and other species splits. The species names in the on-line tables will be updated to current practice.

Subspecies. Traditionally the fifth digit was used only where the bird has been recognized by the ringer (or finder) as being of the particular subspecies given and not simply allotted to a particular subspecies because of the place or date of capture. This remains the same for many species but where species have been split (e.g. *Larus argentatus*) a non-zero fifth digit will indicate a full species.

Where the species has only been allocated to a group, the fifth digit is 9 (e.g. (*Ardea* sp., *Larus* sp.).

Missing codes. If you need a code for a bird not on the web site tables, then email edb@bto.org with details of the bird.

Feral species. It is up to the ringer is to judge whether a particular bird is feral or not. Clues can come from plumage, structure, size, habitat, circumstances, other birds nearby etc.

Hybrids. There are potentially very large numbers of hybrids and intermediates. It is unproductive to give them all an individual code-number. The EURING code does give many of them the same code: 24 998: hybrids or intermediates. However, there are some commonly occurring hybrids, such as Pleske's Tit, and these have now been given their own codes (codes 90 000 and above).

| First code | Last code | Use |
|------------|-----------|---|
| 00 000 | 49 999 | EURING bird species |
| 50 000 | 51 999 | Obsolete - European bats |
| 52 000 | 59 999 | Obsolete - Reserved for a world list of bats |
| 60 000 | 64 999 | Obsolete - Sea-mammals world list |
| 65 000 | 69 999 | Reserved for personal/scheme use |
| 70 000 | 79 999 | Reserved |
| 80 000 | 89 999 | Reserved |
| 90 000 | 94 999 | EURING bird species – hybrids and intermediates |
| 95 000 | 99 998 | Reserved |
| 99 999 | | Ring lost or destroyed |

Species and Subspecies as **Concluded** by the scheme.

integer, five digits

The importance of this field is to confirm if the Scheme considers the species, given by the person who handled the bird, is correct or not.

Coding this field is the same as in the previous field.

Note that this field should be the same in all records of a particular bird. Thus, if a bird is ringed as a Redwing but reported incorrectly by a finder as a Song Thrush, the **Species as reported** would be 12 000 but this field would be 12010. If the report was of an unspecified thrush, the species codes would be 12 069 and 12010 respectively.

Manipulated

alphabetic, one character

The options are presented in order with the most important first.

| | |
|---|---|
| H | Hand reared. |
| K | Fledging provoked. |
| C | Captive for more than 24 hours (code date of release). |
| F | Transported (more than 10 km) from co-ordinates coded. |
| T | Transported (more than 10 km) to co-ordinates coded. |
| M | Manipulated (injection, biopsy, radio- or satellite telemetry etc.). |
| R | Ringling accident. |
| E | Euthanised; bird humanely destroyed (reasons will be explained in Circumstances). |
| P | Poor condition when caught. |
| N | Normal, not manipulated bird. |
| U | Uncoded or unknown if manipulated or not. |

Code R to be used where ringling has caused injury to the bird and code P where the bird was already in poor condition when it was caught. Note that accidental loss of more than half the rectrices should cause these codes to be used but not if the loss was during the normal course of the bird's moult.

If more than one of these codes applies to any bird, the appropriate code furthest up the list should be used.

Moved Before the Encounter

integer, one digit

- 0 Not moved (excluding short movements, usually on foot, from catching place to ringing station).
- 2 Moved unintentionally by man or other agency.
- 4 Moved intentionally by man.
- 6 Moved by water (e.g. found on shoreline).
- 9 Uncoded or unknown if moved or not.

The movement indicated by these codes is that which has happened before the encounter has been reported and indicates that the bird may have last been alive in the wild state at some place other than the capture / recapture / recovery locality coded.

Moved by water will include not only birds floating down river or drifting in the tide at sea, but also corpses found stranded on the tide-line, found in flotsam inland after floods or found on the shore of large lakes (big enough to have possible significant displacement of the body after death).

Moved intentionally by man will include caged birds offered for sale in markets or shot game birds offered for sale where it is not possible to discover where they were caught or killed. It should also be used for ring or ring and leg (02 and 03 respectively in the field **Circumstances**) found in circumstances where it is obvious that they have been moved by man intentionally (e.g. in a Post Office, in a drawer).

Moved by other agency will most commonly be used for unintentional movement by man when the bird has been struck by and stuck in a moving vehicle. However it can be used for birds killed by predators where they may have moved their (ringed) prey a significant distance.

Catching Method

alphabetic, one character

- (one 'hyphen') not applicable, because there was no catching at all (for example 'found' or 'found dead' or 'shot'). Field sightings of colour-marked birds or metal rings should be coded with the hyphen but given **Circumstances** code 28 or 80 – 89.
- A **Actively** triggered trap (by ringer).
- B trap automatically triggered by **Bird**.
- C **Cannon** net or rocket net.
- D **Dazzling**.
- F Caught in **Flight** by anything other than a static mist net (e.g. flicked).
- G Nets put just under the water's surface and lifted up as waterfowl (ducks, **Grebes**, divers) swim over it.
- H By **Hand** (with or without hook, noose etc.).
- L c**Lap** net.
- M **Mist** net.
- N On **Nest** (any method). Not applicable to nestlings which are still in the nest. Use – for these.
- O Any **Other** system (the alphabetic character O).
- P **Phut** net.
- R **Round up** whilst flightless.
- S Bal-chatri or other **Snare** device.
- T Helgoland **Trap** or duck decoy.
- U Dutch net for **PIU**vialis apricaria.
- V Roosting in ca**V**ity.
- W Passive **Walk-in** / maze trap.
- Z Unknown.

Catching Lures

alphabetic, one character

- Not applicable, because there was no catching lure at all (for example 'found' or 'found dead' or 'shot').
- U Unknown or not coded.
- A Food.
- B Water.
- C Light.
- D Decoy birds (alive).
- E Decoy birds (stuffed specimens or artificial decoy).
- F Playback call (same species).
- G Playback call (other species).
- H Sound from mechanical whistle.
- M More than one lure used.
- N Definitely no lure used.

Sex, as **Mentioned** by the person who handled the bird.

alphabetic, one character

- U Unknown.
- M Male.
- F Female.

Sex, as **Concluded** by the Scheme.

alphabetic, one character

Coding in this field is the same as in the previous field.

- U Unknown.
- M Male.
- F Female.

The importance of this field is to confirm if the Scheme considers the sex, given by the person who handled the bird, is correct or not.

Age, as Mentioned by the person who handled the bird.

alphanumeric, one character

The age code is a statement about the plumage of the bird rather than about its age in years. **Do not calculate the age** of a retrapped bird even if you know the exact age of the bird from its ringing circumstances. The task of calculation of ages belongs to the analyst, not the ringer or data coder.

- 0 Age unknown, i.e. not recorded.
- 1 Pullus: nestling or chick, unable to fly freely, still able to be caught by hand. Note that this includes wildfowl, waders etc. which may have well developed body plumage but primaries insufficiently grown to allow sustained flight and thus can be considered to be hatched in the vicinity of the ringing location.
- 2 Full-grown: able to fly freely but age otherwise unknown.
- 3 First-year: full-grown bird hatched in the breeding season of this calendar year.
- 4 After first-year: full-grown bird hatched before this calendar year; year of hatching otherwise unknown.
- 5 2nd year: a bird hatched last calendar year and now in its second calendar year.
- 6 After 2nd year: full-grown bird hatched before last calendar year; year of hatching otherwise unknown.
- 7 3rd year: a bird hatched two calendar years before, and now in its third calendar year.
- 8 After 3rd year: a full-grown bird hatched more than three calendar years ago (including present year as one); year if bird otherwise unknown.
- 9 4th year: a bird hatched three calendar years before, and now in its fourth calendar year.
- A After 4th year: a bird older than category 9 – age otherwise unknown.
- B 5th year: one year older than category 9 – age known exactly to the year.
- C, D, E, F, G, H onwards *et seq.*

Because the calendar year is used throughout this coding system all birds change code overnight on December 31st – January 1st. Every code from 2 upwards has two added to the age because a bird identifiable at the end of December as 'First-year' (code 3) will, at the beginning of January, be 'Second-year' (code 5) and so on. After the autumn moult, the age code reverts to a lower value.

In this system, odd numbers indicate that the calendar year of hatching can be determined exactly from the state of the plumage; even numbers indicate that the year cannot be known exactly from the plumage. With each increasing year of knowable age, the code increases by 2. Note that letter codes will only be usable on a very small number of birds – even a very large bird of prey is unlikely to be ageable as anything higher than G or H at the very most. Codes over 6 are unlikely to be usable on small passerines.

Note that, in many cases where birds are reported by members of the public, the age code will be 0 or 2.

Age, as Concluded by the Scheme.

alphanumeric, one character

These age codes follow the same coding system as the **Age as mentioned**. In general, if there is no conflict between the age codes for the ringing and subsequent encounter, the Age as concluded values should be the same as the **Age as mentioned** values.

The importance of this field is that it will be the prime field used by analysts for selecting cohorts of birds by age. As for the **Age as mentioned field**, this field is a statement about plumage. If the record refers to the first encounter of a bird, this field will be, almost invariably, the same as that given by the ringer. For subsequent encounters it will serve to confirm whether or not the Scheme considers the age, given by the person who handled the bird, is correct or not. Coding this field is the same as in the previous field, although the alphabetic codes will rarely be used.

Where there is a conflict between the age as reported on two successive encounters of a bird, the scheme must amend either or both of the **Age as concluded** records. However, in all cases, the **Age as concluded** must be no higher than that which could be determined by examination of the birds' plumage. Thus, a Blackbird which had been ringed 10 years before its recovery should not be given an age code higher than 6. In general this will mean rounding the age code to a lower, even number.

The examples below are intended to show how this field is determined in cases of conflicts. As with the **Age as mentioned** field, the age of the bird in calendar years must not be calculated by the scheme. It is the work of the analyst to calculate ages in calendar years from recapture histories if that is what is needed.

- 1 A member of the public reports a 'baby Great Tit' in August. The bird was ringed as an adult Coal Tit *Parus ater* (age 6) in the previous spring. The age as reported will be 3 (for a bird of the year) but the age as concluded will be 4 (by August the adult will have moulted and not be ageable any longer as 6). In this case, of course, the species as reported will be 14610 but the species as concluded 14640. The ringing record remains unchanged.
- 2 A Wren *Troglodytes troglodytes* is ringed as a nestling but retrapped in July by a ringer who calls it an adult female – mistaking the bare juvenile belly for a brood patch. The age as concluded will be 2 (the age was obviously not clear from the plumage). The Sex as reported will be F but the sex as concluded must be U. The ringing record remains unchanged.
- 3 A returning White Stork *Ciconia ciconia* in spring is reported by a member of the public reading the ring (who has also misunderstood the EURING coding system) as age code P because he is familiar with this bird which returns to the same nest site each year. He also says it is in full adult plumage. The age as concluded must be 6 because, with annual complete adult moult, birds of more than two years cannot be further aged just by examination of the plumage.
- 4 A ringer catches a previously-ringed Bullfinch *Pyrrhula pyrrhula* in January and gives it age code 6. It had been ringed the previous November and given age code 3. Here there is a disagreement between ringers. In the absence of any other information, it must be treated as of unknown age. The ringing record must be changed to have age as concluded 2 and the control record be given the age concluded code 4.
- 5 An Oystercatcher *Haematopus ostralegus* was ringed as a pullus in 2000 and reported by a member of the public as a long-dead black and white bird late in 2013. The Age as reported must be 0 because no age was mentioned by the finder. The Age as concluded must be 2 because, from the reported information we can know no more than the bird had developed, at least, its first set of feathers.
- 6 An Oystercatcher *Haematopus ostralegus* was colour-ringed as a pullus in 2000 and already had a long, known history of resightings. It was resighted again in 2013 by a person who had read, but not understood, this manual. He reported the age as V (now in its 14th calendar year). The Age as reported must be V. However, the Age as concluded must be 8 because that is the highest age code that can be determined from plumage alone.

Status

alphabetic, one character

All full-grown birds must have a Status code, even if it is the unknown/not recorded code, U. Birds ringed as pulli must be coded with a hyphen. These codes are in order of priority. Thus if a wintering Blackbird is caught at a roost, the Status code will be R, not W. Likewise a moulting bird which is also nesting should have the status code N.

These codes are listed in descending order of priority.

- bird a pullus (one 'hyphen').
- U Unknown or unrecorded.
- N Nesting or Breeding.
- R Roosting assemblage.
- K In Colony (not necessarily breeding but not pullus).
- M Moulting assemblage (whether bird moulting or not).
- T MoulTing.
- L Apparently a Local bird, but not breeding.
- W Apparently a bird Wintering in the locality.
- P On Passage – certainly not a local breeding nor wintering bird (includes birds attracted to lighthouses).
- S At Sea – birds on boats, lightships or oil rigs.

Code U (unknown or unrecorded) must be used unless there is complete certainty about the status. Do not make conclusions based on "I do come here often and the birds always behave in that way".

Brood Size only for records of nestlings

integer, two digits

The biologically important information is the number of young alive at the time of ringing, regardless whether they were already ringed, were ringed at that time, or not ringed at all.

Note the two 'unknown' codes 00 and 99 apply to broods from one and more than one female respectively.

If the bird is not a nestling:

- Bird is not a nestling (two hyphens).

If the brood is from one female:

- 00 Unknown or not coded.
- 01 1 chick in the nest.
- 02 2 chicks in the nest.
- ...
- 12 12 chicks in the nest.
- ...

If the brood is from more than one female:

Add 50 to the number in the brood (unless the number in the brood is unknown or not recorded).

Examples.

- 52 2 chicks in the nest (brood from more than one female, $50 + 2 = 52$).
- 65 15 chicks in the nest (brood from more than one female, $15 + 50 = 65$).
- 72 22 chicks in the nest (brood from more than one female, $22 + 50 = 72$).
- 99 Unknown/not recorded (brood from more than one female).

Pullus Age

integer, two digits

| | |
|-----|-------------------------------------|
| -- | Bird is not a pullus (two hyphens). |
| 99 | Pullus age not recorded. |
| 00 | Pullus age 0 days. |
| 01 | pullus age 1 day. |
| ... | ... |
| 06 | Pullus age 6 days. |
| 13 | Pullus age 13 days. |
| 44 | Pullus age 44 days. |
| ... | ... |

For accuracy of pullus age see **Accuracy of Pullus Age** field.

Accuracy of Pullus Age

Alphanumeric, one digit

| | |
|---|---|
| - | Bird is not a pullus (a 'hyphen'). |
| 0 | Accurate to the day. |
| 1 | Accurate to within 1 day either side of day coded. |
| 2 | Accurate to within 2 days either side of day coded. |
| 3 | Accurate to within 3 days either side of day coded. |
| 4 | Accurate to within 4 days either side of day coded. |
| 5 | Accurate to within 5 days either side of day coded. |
| 6 | Accurate to within 6 days either side of day coded. |
| 7 | Accurate to within 7 days either side of day coded. |
| 8 | Accurate to within 8 days either side of day coded. |
| 9 | Accurate to within 9 days either side of day coded. |
| U | Unrecorded / not known. |

Date

integer, eight digits

This field must have exactly 8 numbers: do not omit leading zeros for either day or month.

The date in days, months and years to be coded as follows:

| | ddmmyyyy |
|--------------------------------|-----------------|
| 1 st January 1977 | 01011977 |
| 5 th September 2013 | 05092013 |
| 17 th June 1949 | 17061949 |
| 30 th March 1965 | 30031965 |
| 15 th October 1923 | 15101923 |
| 29 th August 1949 | 29081949 |
| 2 nd July 2008 | 02072008 |
| 30 th December 1977 | 30121977 |
| 29 th May 2002 | 29052002 |
| 9 th November 1896 | 09111896 |
| 18 th February 2102 | 18022102 |

Any inaccuracy of date is indicated by the contents of the column concerning **Accuracy of Date**. An estimated real date should always be entered in these eight columns.

Do not use hyphens when exact dates are unknown. For example, if the exact day in February 1999 was not known, code **Date** as 15021999 and **Accuracy of Date** as 4.

Accuracy of Date

integer, one digit

- 0 Accurate to the day.
- 1 Accurate to within 1 day either side of date coded.
- 2 Accurate to within 3 days either side of date coded.
- 3 Accurate to within 1 week either side of date coded.
- 4 Accurate to within 2 weeks either side of date coded.
- 5 Accurate to within 6 weeks either side of date coded.
- 6 Accurate to within 3 months either side of date coded.
- 7 Accurate to within 6 months either side of date coded.
- 8 Accurate to within some years only.
- 9 Date of issue of ring or other earliest possible use of ring (only for ringing record) **or**, date of recovery report (either on letter or postmark) **or**, date of finding coded, but bird long dead, found mummified, ring in owl pellet, hunters collection etc. (may be used even if ringing date within the previous 6 months).

Code inaccuracy as 8 when the time of year given but actual year in doubt: e.g. 'Found over Christmas either 2004 or 2005' should be coded 8 in this column and 25 12 2004 as date, rather than 7 in this column and 25 06 2005.

Note that codes 2-8 should be used to indicate lack of accuracy in the reporting letter – e.g. 'I found this bird about three weeks ago' and **never** because of the finders estimate – e.g. 'it looked as though it had been dead for about three weeks'.

Exact coding of inaccurate dates will depend on exactly what is said by the finder and whether the date to be coded is recent or not. For example 'End of September' might be 27 09 accuracy 2 if the letter was received early in October 2008 but 25 09 accuracy 3 if it was written in December 2008.

Time

alphanumeric, four characters

The actual time of the day in hours and minutes, according to a 24 hour clock in local time:
0008, 0948, 1556, 2359 etc.

When you analyse data be aware of summer- and winter-time in some countries.

When the time is unknown or has not been recorded, use four hyphens, ----

When only the hour of the day is recorded, the last two characters should be hyphens.

| Time | Code | Time | Code |
|-------------|-------------|-------------|-------------|
| 0000-0059 | 00-- | 1200-1259 | 12-- |
| 0100-0159 | 01-- | 1300-1359 | 13-- |
| 0200-0259 | 02-- | 1400-1459 | 14-- |
| 0300-0359 | 03-- | 1500-1559 | 15-- |
| 0400-0459 | 04-- | 1600-1659 | 16-- |
| 0500-0559 | 05-- | 1700-1759 | 17-- |
| 0600-0659 | 06-- | 1800-1859 | 18-- |
| 0700-0759 | 07-- | 1900-1959 | 19-- |
| 0800-0859 | 08-- | 2000-2059 | 20-- |
| 0900-0959 | 09-- | 2100-2159 | 21-- |
| 1000-1059 | 10-- | 2200-2259 | 22-- |
| 1100-1159 | 11-- | 2300-2359 | 23-- |

Place Code (at time of encounter)

alphanumeric, four characters

The full list of codes can be downloaded or accessed interactively at:

www.euring.org/data_and_codes/euring_code_list/index.html

The purpose of the Place Code is solely to identify particular geographical areas in terms of the administrative region at the time of the encounter. No political statements are implied by any of these codes.

Administrative boundaries of both countries and internal regions change from time to time. For instance a place now in the administrative region of North Lincolnshire in the UK, GBLN was until recently in Humberside, GBHU and, before that in Lincolnshire, GB32. Searching for records in, say, Humberside coded as GBHU would miss all relevant records coded as GB32 or GBLN. Including these codes in the search criteria would then include records from other parts of Lincolnshire which were never part of Humberside. The situation may be more complicated in various other parts of Europe.

For this reason this place code is now to be the place code at the time of the encounter. Once applied to a record it must never be changed. In order to accommodate the current administrative region name an additional field has been defined **Current Place Code**. At the time of encoding the record that field can have the same value as this field, or be left blank. When there are administrative changes, the Current Place Code can be amended appropriately.

In both place code fields:

The **first pair of characters** identifies the country and are always alphabetic.

The **second pair of characters** identifies the sub-division of the country.

These are either alphabetic or numeric.

The use of '00' as the last two characters can mean either a specific sub-division of a country (e.g. ES00 is Álava, Spain) or that codes have not been allocated to subdivisions of that country (e.g. YS00, Somalia).

When the area within a country with subdivisions is not known, e.g. bird reported in 'The Netherlands', then the third and fourth characters should be coded as '--'. Do not use '00' as this could mean a specific part of the country concerned.

When possible all spellings of the names of countries and provinces refer to *The Times Comprehensive Atlas of the World. Tenth edition 1999, reprint with changes 2000. Times Books, 77-85 Fulham Place Road, London W6 8JB, ISBN 0-7230-0792-6*, in this publication always referred as *the Times Atlas*. All boundaries were also taken from this atlas. Subsequent changes to region names and boundaries have used locally available official information. In many cases the country code used is the ISO 3166-1 country code. For subdivisions of countries use the links from the Wikipedia pages http://en.wikipedia.org/wiki/ISO_3166-1

Old Place Codes

Old, numeric place codes can be found in the *EURING Code Manual* (1966) and in the *Code Manual New EURING* (1979). Both are available on the EURING website www.euring.org

Internet gazetteers.

There are internet sites where you can search for geographical names and their co-ordinates. A few of those sites are given here, but remember that websites come and go unpredictably.

<http://earth.google.com> <http://nationalmap.gov/> <http://www.multimap.com/>

<http://maps.google.com> <http://www.postleitzahl.org/>

<https://www.cia.gov/library/publications/the-world-factbook/>

Updating the Place Code

Whenever you cannot find a country code in this list please contact edb@bto.org

Geographical Co-ordinates

integer, fifteen digits

Co-ordinates in degrees, minutes and seconds are becoming less used in favour of degrees with decimal points. This format which EURING has used has also become increasingly awkward because of the sometimes unpredictable way in which spreadsheets handle variables which have numbers and arithmetic signs. Two new fields have been defined: **Longitude** and **Latitude**. Schemes may continue to use this field or use the two new fields as most convenient. When data are loaded into the data bank it will be longitude and latitude which will be held (although, clearly, it is simple to convert between the two formats if required).

If schemes submit co-ordinates in the new Longitude and Latitude fields, then this field should be included as a string of 15 dots '.....'

This field must have exactly 15 characters. Do not omit leading zeroes. Note particularly that the longitude requires three digits for the minutes and thus occupies one more position than the latitude.

Ringling schemes should continue to use their own traditional system for rounding or truncating co-ordinates. Co-ordinates should be given to as high a degree of accuracy as possible and appropriate but it is recognised that, often, the nearest minute of longitude or latitude will be appropriate. Analysts should note that co-ordinates in 1969 EURING code were stored to the nearest tenth of a degree only (and this may have been truncated or rounded). Any records converted from 1969 code will have this further measure of uncertainty.

The co-ordinate datum system is WGS 84.

The field is formatted thus:

ABBCCDDWXXXYYZZ where ABBCCDD represents the latitude and WXXXYYZZ the longitude:

Latitude

| | | |
|----|------------|---|
| A | Hemisphere | North is + and South is - (1 character). |
| BB | Degrees | in the range from 0 to 90 (2 characters). |
| CC | Minutes | in the range from 0 to 59 (2 characters). |
| DD | Seconds | in the range from 0 to 59 (2 characters). |

Longitude

| | | |
|-----|------------|---|
| W | Hemisphere | East is + and West is - (1 character). |
| XXX | Degrees | in the range from 0 to 180 (note 3 characters). |
| YY | Minutes | in the range from 0 to 59 2 characters). |
| ZZ | Seconds | in the range from 0 to 59 (2 characters). |

When the co-ordinates are not known exactly, for example when the subdivision in seconds is not known, make a best estimate and code the field **Accuracy of co-ordinates** accordingly. Do not use hyphens in the code when the seconds are not known. For example, use +571800+0015200, do not use +5718--+00152--

Examples:

| | | | |
|-----------------|----------------|-----------------|-------------------------------|
| +340311-1181456 | (34° 3' 11" N | 118° 14' 56" W) | USA, Los Angeles |
| +592624+0244741 | (59° 26' 24" N | 24° 47' 41" E) | Estonia, Tallinn |
| +515706+0054513 | (51° 57' 06" N | 5° 45' 13" E) | Netherlands, Vogeltrekstation |
| +522526+0004449 | (52° 25' 26" N | 0° 44' 49" E) | England, Thetford |
| -335405+0182902 | (33° 54' 05" S | 18° 29' 2" E) | South Africa, Cape Town |
| -351748+1490731 | (35° 17' 48" S | 149° 7' 31" E) | Australia, Canberra |
| +474425+0085853 | (47° 44' 25" N | 8° 58' 53" E) | Germany, Radolfzell |
| +620238+1294221 | (62° 2' 38" N | 129° 42' 21" E) | Russian Federation, Yakutsk |
| -210832-1751218 | (21° 8' 32" S | 175° 12' 18" W) | Toku Islands, Nuku'alofa |
| +384352-0092634 | (38° 43' 52" N | 9° 26' 34" W) | Portugal, Lisboa |
| -225439-0431322 | (22° 54' 39" S | 43° 13' 22" W) | Brasil, Rio de Janeiro |

Co-ordinates according to the CD-ROM: *Worldmap* from Wolters-Noordhof, the Netherlands.

Accuracy of Co-ordinates

Alphanumeric, one digit

The original accuracy of co-ordinates field was defined in the days when recovery processing was paper-based. We now have machinery which allows far greater precision in finding location and has the capacity to deal with multiple encounters of the same bird, often very near to each other. For this reason a second scale of accuracy measurements is defined. It is alphabetic so it is implicit in the code itself which scale is being used. Schemes are free to use whichever scale is most convenient, indeed there is no need for all records from one scheme to use the same scale.

When information about the accuracy of data in a particular field is required, the accuracy is normally given in the same units of measurements as the main data. This causes a problem for co-ordinates as an inaccuracy in longitude of one degree on the equator has a higher impact than one degree in the north of Norway. Therefore the accuracy of co-ordinates is given in distances rather than in differences of co-ordinates.

Numeric scale

- | | |
|---|--|
| 0 | Accurate to the given co-ordinates (somewhere in a circle with radius 1 km). |
| 1 | Somewhere in a circle with radius 5 km. |
| 2 | Somewhere in a circle with radius 10 km. |
| 3 | Somewhere in a circle with radius 20 km. |
| 4 | Somewhere in a circle with radius 50 km. |
| 5 | Somewhere in a circle with radius 100 km. |
| 6 | Somewhere in a circle with radius 500 km. |
| 7 | Somewhere in a circle with radius 1,000 km. |
| 8 | Reserved. |
| 9 | Somewhere in the country or region given in the field Place Code . |

Alphabetic scale

| Code | Accuracy | Notes |
|-------------|--|---|
| A | Somewhere in a circle with radius 1 m | |
| B | Somewhere in a circle with radius 5 m | |
| C | Somewhere in a circle with radius 10 m | |
| D | Somewhere in a circle with radius 50 m | |
| E | Somewhere in a circle with radius 100 m | |
| F | Somewhere in a circle with radius 500 m | |
| G | Somewhere in a circle with radius 1 km | |
| H | Somewhere in a circle with radius 5 km | |
| I | Somewhere in a circle with radius 10 km | |
| J | Somewhere in a circle with radius 50 km | |
| K | Somewhere in a circle with radius 100 km | |
| L | Somewhere in a circle with radius 500 km | |
| M | Somewhere in a circle with radius 1,000 km | |
| ... | | |
| Z | | Somewhere in the country or region given in the field Place Code . |

Schemes should exercise great caution when using the alphabetic scale. GPS co-ordinates as precise as 1 m (i.e. Code A) are almost universally unreliable. For much general ringing the default code is likely to be at least F, quite probably G or even H. Codes D or C are likely to be appropriate only where an encounter is located within, say, a particular mist net. Codes B and A are probably only appropriate for the location of a particular nest or song post.

Condition

integer, one digit

This field codes condition of the bird when found and is only modified by other columns where 9 in the field **Accuracy of date** is used to indicate that a bird has been dead for a very long time.

- | | |
|---|---|
| 0 | Condition completely unknown. |
| 1 | Dead but no information on how recently the bird had died (or been killed). |
| 2 | Freshly dead – within about a week. |
| 3 | Not freshly dead – information available that it had been dead for more than about a week. N.b. for very long dead birds, use 9 in the field Accuracy of Date , and 3 here. |
| 4 | Found sick, wounded, unhealthy etc. and known to have been released (including ring or other mark identified on a bird in poor condition without the bird having being caught). |
| 5 | Found sick, wounded, unhealthy etc. and not released or not known if released. |
| 6 | Alive and probably healthy but taken into captivity. |
| 7 | Alive and probably healthy and certainly released (including ring or other mark identified on a healthy bird without the bird having being caught). |
| 8 | Alive and probably healthy and released by a ringer (including ring or other mark identified on the bird by a ringer without the bird having being caught). 'A ringer' means any licensed ringer, not just the ringer who ringed that bird. |
| 9 | Alive and probably healthy but ultimate fate of bird is not known. |

Only where the finder provides wholly reliable information enabling a better estimate of the date of death to be determined from the circumstances of finding should that date of death be used (with appropriate accuracy code). Where there is any doubt the **finding** date must be coded and not an unreliable estimated date of death.

For example:

- 1 The finder reported the bird was 'dead for about three weeks'. Code the date of finding as given and give condition code 3.
- 2 I visit the local lake every day to bird watch and noticed, on 1st January 2008, the body of a swan on an island. The bird had not been there the previous day. On 15th February a fisherman took me to the island in his boat and I found the enclosed ring on the Swan's remains. Code 01 012008 and 2, not 15 022008 and 3.

Circumstances

integer, two digits

The code for circumstances of the encounter has two digits: the first is traditionally referred to as the primary division. The list of primary divisions is given here. The full list of 2-digit codes can be downloaded or accessed interactively at:

www.euring.org/data_and_codes/euring_code_list/index.html

- 0 Unknown circumstances or unknown whether through man's agency or naturally (includes attracted to domestic animals).
- 1 Intentionally by man -shot.
- 2 Intentionally by man – other means (includes trapped, poisoned, ring number read in field etc.). All captures (=ringing data) and recaptures (caught and released).
- 3 Accidentally by man – pollution.
- 4 Accidentally through human agency (not pollution): includes traffic accidents, collision with wires etc., entering man - made artefacts, accidents with machinery, drowned at artificial water. N.b. attracted to domestic animals is 0. Note that 40 – 42 represent traffic accidents and 43 – 45 collisions with static objects.
- 5 Natural causes – diseases and other natural ailments.
- 6 Predation by any animal other than man (except hunted by falconer's bird – which would be covered by 2 above).
- 7 Other natural causes. Drowned (natural water bodies), trapped, tangled and collided with natural objects and also weather and starvation or thirst.
- 8 Bird identified from something else than the metal ring.
- 9 Other special circumstances.
- 99 Totally unknown circumstance: not even stated to be 'found'.

Note that coding of this field is sometimes inter-related with some other fields including **Manipulated, Circumstances Presumed, Moved, Condition**.

In all parts of this field where a bird has been reported as dead, the fact of killing is given in the code entered for the field **Condition**.

In practice 8|61 (condition=8, circumstances=61) could be used for an apparently healthy bird taken by a ringer from a cat and released.

Circumstances code 48 - some examples

Schemes have asked for some typical examples of this code.

| | |
|--------------|--|
| Industrial | caught in moving belt; blasting operation at mine |
| Agricultural | caught in fruit cage, trapped by plough |
| Forestry | killed when tree felled, crushed between floating logs |
| Sporting | killed by golf ball, hit during boat race |
| Military | killed on bombing range, concussed by artillery fire |

Circumstances Presumed

integer, one digit

- 0 No doubt about the circumstances.
- 1 Circumstances presumed.

Circumstances Presumed can be used in combination with the entries in the field Circumstances to modify the circumstances, e.g. Circumstances presumed, code 1, changes 43 'Killed against wires' to 'Found under wires' etc.

EURING Code Identifier

integer, one digit

This field shows the history of the record. It is included because some information may be lost when records are translated from one version of the code to a newer one. Analysts will need to be aware, for instance, that records that were originally in 1966 code had co-ordinates given to the nearest tenth of a degree rather than to the nearest minute.

All data in the EURING Data Bank will be held in EURING2020 code. Any data submitted in earlier codes will be converted to 2000+ code but this field will remain unchanged. Thus, for example, a record originally coded in 1966 code, translated by the scheme to 1979 code and submitted to the EDB in that form will have code identifier 1. When that record is exported from the EDB it will be in 2020 code but still retain code identifier 1 even though it is now in 2020 code. This code indicates the history of the record up to the point at which it was submitted to the EDB.

Because of changes in taxonomy it is important to be able to separate records where former species have been split from those where they have not been split. Any records directly coded in 2020 format must have the current species codes (e.g. *Larus argentatus* will be 05921 rather than the former aggregate code 05920). A EURING identifier of 6 will indicate that all species coding is current. Other codes will indicate the record has been translated from earlier versions so species will need to be treated appropriately.

- 0 *EURING Code Manual* (1966). Directly coded (no translation).
- 1 *Code Manual New EURING* (1979), but translated from *EURING Code Manual* (1966).
- 2 *Code Manual New EURING* (1979).
Directly coded (no translation of older codes).
- 3 Translated from earlier code but exact route uncertain.
- 4 *EURING exchange-code 2000 or 2000+*.
Directly coded (no translation of older codes).
- 5 Direct translation from 2000 or 2000+ code. Note that older records with identifiers 1, 2, 3 will still hold the same identification code when they are further translated to 2020 code.
- 6 *EURING exchange-code 2020*
Directly coded (no translation of older codes).

Distance

integer, maximum of five characters

Calculated by computer as the distance between the current record and the first record (=ringing data). The distance is given in kilometres (00000 - 99999).

A distance is always calculated, even if the geographical co-ordinates are given as inaccurate. Analysts should check the field **Accuracy of co-ordinates**.

If the distance is not present in the first record (=ringing data), in that case code the code is ----- (five hyphens).

Note that the distance and direction between two points can be calculated either according to orthodrome (shortest distance) or loxodrome (constant direction) methods. These two methods can give rather different results (Imboden & Imboden 1972). The method preferred by EURING is loxodrome. Analysts should check which method is used in the data or else feel free to recalculate distances before analysis.

Direction

integer, three characters

Calculated by computer as the direction to the current record from the first record (=ringing data). The direction is given in degrees (000 - 359).

A direction is always calculated, even if the geographical co-ordinates are given as inaccurate. Analysts should check the field **Accuracy of co-ordinates**.

The direction is not present in the first record (=ringing data). In that case use the code --- (three hyphens).

Note that the distance and direction between two points can be calculated either according to orthodrome (shortest distance) or loxodrome (constant direction) methods. These two methods can give rather different results (Imboden & Imboden 1972). The method preferred by EURING is loxodrome. Analysts should check which method is used in the data or else feel free to recalculate distances before analysis.

Elapsed Time

integer, maximum five characters

Calculated as the elapsed time between the current record and the first record (=ringing data). The elapsed time is given in days (00 000 - 99 999). Schemes should always calculate this field before submitting data to the EURING Data Bank.

Elapsed time is always calculated, even if the date is given as inaccurate. Users should check the field **Accuracy of date**.

The elapsed time is not given on the first record (=ringing data), in that case use the code ----- (five hyphens).

Wing Length

numeric

In millimetres, to a maximum precision of 0.5 mm. Normally, wing length will be recorded only to the nearest millimetre.

This is the maximum chord measurement, as described by Svensson (1992).

Third Primary

numeric

Length of the third primary feather, in millimetres, to a maximum precision of 0.5 mm.

This is the third primary feather length (Federlänge), measured with a 1.4 mm diameter vertical pin at the zero end of the ruler as first described by Berthold and Friedrich (1979). For an English description see Bairlein (1995).

State of Wing Point

alphabetic, 1 character

The condition of the longest primary feather. Wing measurements will not normally be taken if the codes B, G or V are applied. If the field is unpopulated it will be assumed that the wing is 'normal' and so any wing length is representative.

| | |
|---|--------------------------|
| U | Unknown or not recorded. |
| A | Abraded. |
| B | Broken. |
| G | Growing. |
| M | Feather M issing. |
| V | Very abraded. |

Mass

numeric

In grams, measured to a maximum precision of 0.1 g.

Moult

alphabetic, one character

A single letter code for main, clearly identifiable moult states.

| | |
|---|---|
| B | active B ody and/or covert moult not as part of post-juvenile or main moult. |
| J | wholly J uvenile plumage. |
| M | active M oult which includes flight feathers (primary and/or secondaries). |
| P | partial P ost-juvenile moult which does not include flight feathers. |
| X | Examined for moult, no moult found and not in juvenile plumage. |
| U | U nknown, not examined for moult or not recorded. |

Plumage Code

alphanumeric, one character

For extra information to enhance age code. One character from either the numeric or alphabetic lists. For many passerines, this code may remain empty. For waders, the traditional numeric codes can be used.

Alphabetic codes for any species

| | |
|---|--|
| U | Unknown or not recorded. |
| A | Adult plumage (if no other codes applicable). |
| B | Breeding plumage – where species have a distinct breeding plumage. |
| D | Downy – for nestlings and nidifugous chicks. |
| E | Eclipse plumage (ducks). |
| F | First winter (typically corresponding to EURING age codes 3 or 5). |
| I | Immature (except for first winter plumage). |
| J | Juvenile. |
| W | Winter plumage – where species have a distinct winter plumage. |

Numeric codes for waders only

| | |
|---|-------------------------------|
| 1 | Full winter plumage. |
| 2 | Trace of summer plumage. |
| 3 | $\frac{1}{4}$ summer plumage. |
| 4 | $\frac{1}{2}$ summer plumage. |
| 5 | $\frac{3}{4}$ summer plumage. |
| 6 | Trace of winter plumage. |
| 7 | Full summer plumage. |

Hind Claw

numeric

In millimetres, to a maximum precision of 0.1 mm. For details of method see Svensson (1992).

Bill Length

numeric

In millimetres, to a maximum precision of 0.1 mm. Normally, lengths over 100 mm will be given to the nearest millimetre.

If this measurement is recorded, then a code must be given in the next field, **Bill method**.

Bill Method

alphabetic, one character

A single letter code. For details of methods see Svensson (1992). This field is mandatory if the **Bill Length** is given.

| | |
|---|-------------------------------|
| C | From tip to C ere. |
| F | From tip to F eathers. |
| N | From tip to N ostril. |
| S | From tip to S kull. |

Total Head Length

numeric

In millimetres, to a maximum precision of 0.1 mm. Normally, lengths over 100 mm will be given to the nearest millimetre. For details of the method see BTO Ringers' Manual.

Tarsus

numeric

In millimetres, to a maximum precision of 0.1 mm. Normally, lengths over 100 mm will be given to the nearest millimetre.

If this measurement is recorded, then a code must be given in the next field, **Tarsus Method**.

Tarsus Method

alphabetic, one character

A single letter code.

- | | |
|---|---|
| M | Maximum tarsus – folded foot to extreme end of tarsal joint. (BTO Ringers' Manual). |
| S | Minimum tarsus (Svensson 1992) – length of tarso-metatarsal bone. |
| T | Tarsus and Toe – from extreme end of tarsal joint to tip of longest toe with foot flattened on a rule. (BTO Ringers' Manual). |

This field is mandatory if the **Tarsus** is given.

Tail Length

numeric

In millimetres, to a maximum precision of 0.1 mm. Normally, lengths over 100 mm will be given to the nearest millimetre. For details of the method see Svensson (1992).

Tail Difference

numeric

In millimetres, to a maximum precision of 0.1 mm, normally given to the nearest millimetre.

The difference in length between longest and shortest tail feathers measured along the axis of the tail with the tail closed. The sign is ignored (i.e. rounded and forked tails will both have positive values). For details of the method see Svensson (1992).

Fat Score

integer, one digit

Codes are defined for three methods of assessing fat – the BTO Biometrics Working Group, ESF and Operation Baltic. If a fat score is given, then the relevant code must be given in **Fat Score Method**.

B – Biometrics Working Group

http://bto.org/sites/default/files/u17/downloads/about/resources/fat_scores.pdf

| Score | Description |
|-------|--|
| 0 | Furcular region: No visible fat. Abdomen: Dark red. |
| 1 | Furcular region: trace of fat. (~E0.5). Abdomen: Light red/pink. |
| 2 | Furcular region: base of tracheal pit obscured by fat to about one third full. (~E1.0). Abdomen: Yellow-pink. |
| 3 | Furcular region: tracheal pit about two-thirds full. Muscle within tracheal pit visible between fat and clavicles. (E~1.5). Abdomen: Yellow-pink. |
| 4 | Furcular region: completely filled up to far end of clavicles but still concave (not bulging). (~E3.0). Abdomen: Pale yellow. |
| 5 | As ESF. |
| 6 | As ESF. |
| 7 | As ESF. |
| 8 | As ESF. |

E – ESF system

http://bto.org/sites/default/files/u17/downloads/about/resources/fat_scores.pdf

| Score | Description |
|-------|---|
| 0 | Furcular region: no visible fat. Abdomen: dark red. |
| 1 | Furcular region: wide wedge of fat. Abdomen: trace of fat, light red. |
| 2 | Furcular region: completely covered but deeply concave. Abdomen: slips of fat, light yellow. |
| 3 | Furcular region: moderate fat reserves cover ends of inter-clavicles but concave. Abdomen: flat or slightly bulging pad, light yellow. |
| 4 | Furcular region: filled up to far end of clavicles. Abdomen: covered by clearly bulging pad of fat, yellow. |
| 5 | Furcular region: convex bulge, perhaps overlapping breast muscles. Abdomen: extreme convex bulge, yellow. |
| 6 | Furcular region and Abdomen: fat covering breast muscles by several mm. |
| 7 | Furcular region and Abdomen: 3/4 of breast muscles covered, yellow. |
| 8 | Furcular region and Abdomen: breast muscles not visible, yellow. |

P – Operation Baltic

www.seen-net.eu/index.php?id=24

| Score | Description |
|-------|--|
| 0 | Furcular region: Air sac visible, may be some visible fat. Abdomen: No visible fat, or reddish traces only. |
| 1 | Furcular region: All interior covered with fat. Abdomen: No visible fat, or reddish traces only. |
| 2 | Furcular region: All interior covered with fat. Abdomen: Some infused fat but intestine still visible. |
| 3 | Furcular region: All interior covered with fat. Abdomen: Covered in fat, intestine not visible but liver still visible. |
| 4 | Furculum: Fat is flat or concave. Abdomen: Covered in fat. |
| 5 | Furculum: Fat is convex. Abdomen: Covered in fat. Pectoral muscles: without stripes of fat. |
| 6 | Furculum: Fat is convex. Abdomen: Covered in fat. Pectoral muscles: with stripes of fat. |
| 7 | Furculum: Fat is convex. Abdomen: Covered in fat. Pectoral muscles: partly covered by fat. |
| 8 | Furculum: Fat is convex. Abdomen: Partly covered in fat. Pectoral muscles: Completely covered in fat. |

Conversion table between fat score methods

| BWG | ESF | Operation Baltic |
|-----|-----|------------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |

Fat Score Method

alphabetic, one character

One character code to indicate fat score method used. This field must be populated whenever the **Fat Score** is populated.

| | |
|---|--|
| B | Biometrics Working Group (Ringers' Manual, BTO). |
| E | ESF (Ringers' Manual, BTO). |
| P | OPeration Baltic (www.seen-net.eu/index.php?id=24). |

Pectoral Muscle Score

integer, one digit

A single numeric code to describe state of pectoral muscle.

- | | |
|---|--|
| 0 | Sternum sharp, muscle depressed. |
| 1 | Sternum easy to distinguish, muscle neither depressed nor rounded. |
| 2 | Sternum still discernible, muscle slightly rounded. |
| 3 | Sternum difficult to distinguish, Muscle fully rounded. |

Brood Patch

alphanumeric, one character

A single character to describe, in chronological order, the state of the brood patch in the breeding season. If a brood patch is present, but its state has not been recorded, use code P.

- | | |
|---|----------------------|
| 0 | No patch detectable. |
| 1 | Starting. |
| 2 | Well-defined. |
| 3 | Veined and red. |
| 4 | Wrinkled. |
| 5 | Feathering over. |
| P | Present. |

Photographs illustrating these codes can be downloaded from:

http://www.bto.org/sites/default/files/u17/downloads/about/resources/brood-patch-rb08_0.pdf

Primary Score

integer, 2 digits

The sum of the (usually 10) primary scores. (see **Primary Molt** for details). For birds (e.g. finches) where the outermost primary is minute, the score may be out of 45 rather than 50. For birds with 11 primaries, the outermost, tiny primary is ignored. Scores of V or X are regarded as zero.

Primary Moults

alphanumeric, 10 characters

Ten digits, each in the range 0-5 (or V or X).

| | |
|---|--|
| 0 | Old feather present. |
| 1 | Old feather missing or new feather still completely in pin. |
| 2 | New feather just emerging from quill up to one-third grown. |
| 3 | New feather between one and two thirds grown. |
| 4 | More than two thirds grown but waxy sheath still present at base of quills. |
| 5 | Feather completely new, no waxy sheath remains visible. |
| V | Feather Very old (from a generation previous to feathers being moulted). |
| X | Feather not present on the species (e.g. outermost primary on most finches). |

These digits are arranged from inner to outer primaries. For example, a Collared Dove *Streptopelia decaocto*, which had arrested a full-post juvenile moult in the autumn, with three outer primaries unmoulted, and now had begun to moult the inner primaries as part of its first complete adult moult, might be given a code of 5554100VVV. A Chaffinch *Fringilla coelebs*, with nearly completed moult might be given a code of 555554321X.

Old Greater Coverts

Alphanumeric, one character

The number of unmoulted greater coverts retained after post juvenile moult. This code is normally only applicable for passerines. There is some disagreement over whether there are 9 or 10 greater coverts. The code A is used to indicate '10 old greater coverts'.

Analysts should, therefore, note that a code of 9 could indicate either 9 or 10 retained feathers – according to the convention used. Both 9 and A will indicate that all 9 conventional greater coverts have been retained.

Alula

Alphanumeric, three characters

Three characters to describe the state of the three alula feathers (or three outermost for species with more than three). The characters are given in order smallest feather to largest.

| | |
|---|-----------------------------|
| 0 | Old. |
| 1 | New or growing. |
| U | Unknown whether new or old. |

Thus typical codes may be U10, 110, 111 etc. Always use U for the smallest feather if it cannot be found to ensure there are exactly three characters in this code.

Carpal Covert

integer, one digit

A single integer to describe state of moult of the carpal covert.

| | |
|---|------|
| 0 | Old. |
| 1 | New. |

Sexing Method

alphabetic, one character

The Sexing Method code is to enable analysts to select data appropriately for analyses where sex is a factor. For instance, it would be pointless to perform an analysis of difference in size between the sexes if the sexes of all, or even some, individuals had been determined using some measure of size such as wing length.

Not all schemes, or ringers, record sexing method. Thus the absence of a sexing method code indicates that the method was not recorded explicitly by the ringer or else is not a field held in the scheme's records and is equivalent to a code U.

Some species are sexed by an absolute difference in plumage (e.g. adult Great Spotted Woodpecker, *Dendrocopos major*, or Blackbird *Turdus merula*). In the absence of code P for such birds, or even if the code U is given, it is safe to assume that these have been sexed using the absolute difference in plumage.

- A Activity – sexed by observation of activity or behaviour in the field (including song).
- B Brood patch (for females of some species).
- C Cloacal protuberance for males of some species.
- D Analysis of DNA sample.
- E Internal Examination of cloaca (e.g. for wildfowl).
- L Laparoscopy.
- P Absolute difference in Plumage.
- S Size or brightness. The bird has been sexed on the basis of some measurement or assessment of brightness of plumage where there is no absolute sexual dimorphism (e.g. on *Parus caeruleus*).
- T Post-mortem dissection.
- U Method Unknown or Unrecorded. Note that this means the sexing method, not the sex, is unknown or not recorded.

Place Name

text

The name of the place where the encounter occurs. This will be the name given by the ringer/finder or as amended by the ringing scheme.

This field is primarily for use in between-scheme recovery processing and this field will not be stored in the EDB. More information about handling this, and the next two, fields in the data submission process is given in Chapter 7.

The place name can be written in the normal format which can include commas to separate the various levels. Under no circumstances must the pipe character '|' be used anywhere within this field.

For exchanging data between schemes during recovery processing, it is helpful if place names with more than one level give the widest level first. The levels should be separated by semi-colons.

For example:

Paris; LesHalles
Genève; Jetée des Pâquis
Jersey; St. Peter; Les Augerez
Copenhagen

Remarks

text

This field is free for any relevant remarks or other details. It is primarily for use in between-scheme recovery processing and it will not be stored in the EDB. It could be used, for example, to hold some of the finder's details which the scheme needs for recovery processing. Note that any data stored must comply with relevant national data protection legislation. Fuller information is in chapter 7.

Ringling schemes could also use this field for recording colour-ring codes or details of other unconventional marks. This field must not contain the pipe character '|'.

Reference

text

The scheme's own reference for this bird encounter. This field was initially primarily for use in between-scheme recovery processing and was not stored in the EDB but in future may be stored if submitted. Its function is to identify that bird encounter uniquely even if the record has been amended in some way (e.g. by correcting the date of the encounter). This code is to be used for re-encounters, and for ringing data.

The following protocols must be used. Once this field has been completed for an encounter record it must never be altered, even if other details of the record are changed.

The reference is generated by the scheme that owns the original report of the re-encounter in the following form:

the three characters identifying the scheme
the code that the scheme uses to identify the data

For example:

FRP123456789
HES0A654321
NOS_20131202120000_VBA_2

Existing references as filled by other schemes (or the reporting scheme) must be left unaltered. The reference code is unique in each scheme's database, and with the scheme's three letter code, is therefore unique within EURING.

Latitude

Numeric

Longitude in degrees and decimal points of degrees with a maximum of four decimal places. Typically there will be no more than three decimal places. The decimal point should be a full stop, not a comma.

Points in the northern hemisphere will be positive, those in the southern hemisphere negative.

If location is given in the **Geographical Co-ordinates** field, then this field and the **Latitude** field can be empty. See the instructions given for **Geographical Co-ordinates**.

Longitude

Numeric

Longitude in the same format as Latitude.

Co-ordinates west of the Greenwich meridian will be negative, those to the east will be positive.

Current Place Code

Alphanumeric, four characters

This field can initially be left blank or else hold the same value as the **Place Code**. When there are changes such that the **Place Code** becomes obsolete this field should be used to hold the current value.

Thus if the original place code was AB12 but administrative changes meant the location was now in region YZ89, **Place Code** should still retain AB12 but **Current Place Code** should hold YZ89. Note that care will be needed where a large former region has been replaced by several smaller ones and the Co-ordinate Accuracy in a particular record is not very precise.

More Other Marks

text

This field will be empty unless details of more than one type of other mark need to be given. In that case, **Other Marks Information** will hold one of the codes MM, OM, OP, OT and details of the multiple marks can be held here. The codes are as described in **Other Marks Information** and should be given in alphabetic order, with pairs of letters separated by a space (it is very important not to use any other separator such as a comma).

For example, if a bird carrying a colour ring and radio-tracking device were retrapped, the tracking device removed and replaced with a geolocator the codes here would be: BC ED LB

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For calculations of distances and directions

Distances and directions were originally calculated according to:

Imboden C. & D. Imboden 1972. *Formel für Orthodrome und Loxodrome bei der Berechnung von Richtung und Distanz zwischen Beringung- und Wiederfundort.* Die Vogelwarte 26(4): 336-346.

Distances can now be calculated using various on-line sources or the R package Geosphere.

<https://cran.r-project.org/web/packages/geosphere/geosphere.pdf>

5 DATA SUBMISSION TO THE EDB

Questions relating to data submission should be emailed to edb@bto.org

5.1 Outline of the data submission process

- 1 Schemes are invited to submit their entire recovery data set annually, at a time of year to suit the ringing scheme.
- 2 The data should contain all new recoveries, corrected recoveries and all old recoveries that were submitted previously.
- 3 Data will be validated at the EDB. Details of errors will be sent back to the schemes.
- 4 Provided checks are satisfactory, the existing data in the EDB will be deleted and the new data set loaded.

5.2 Rationale

It may seem unnecessary to resubmit the entire scheme's recovery data set annually. However, the alternatives would be for schemes to submit data only in response to requests or else submit new recovery data annually, together with any corrected recovery data. Both these superficially sensible systems have major administrative disadvantages both for schemes and the EDB.

For ringing schemes, and for the EDB, it should be very simple to submit all recovery data every year. A scheme's routine for selecting records to be submitted will always be the same – include all data. Likewise, the system at the EDB will always be the same – delete all the old data and load all the new. These systems can be entirely automatic with the computer doing almost all the work.

The time of submission should be arranged to suit the individual scheme. This allows schemes to arrange the annual submission to be done at a time when it is most convenient to do so. This should also be better for the EDB. If schemes were all asked to submit data at the same time, the workload at the EDB would become too great at that particular time of year. Far better to allow the workload to be spread throughout the year.

5.3 Which code – 1979, 2000, 2000+ or 2020?

It is hoped that all schemes will soon be able to submit data in EURING 2000+ or EURING 2020 code format. However, it is recognised that for schemes which are already submitting in 1979 code, considerable work may have to be done to change this system. All schemes are under great pressure of time and other resources. Sometimes it will be better to wait for an appropriate time before embarking on the work of changing to the 2000+ or 2020 format. For example, if it is anticipated that the scheme's computer system is to be reorganised in one or two years, then it might be better to wait for this major change – when new systems have to be created anyway – to change to the newer code. EURING 2000+ code continues to be welcome, although there have been a number of changes from 2000+ to 2020 code. These can easily be made at EDB if the scheme does not hold the additional data fields.

Schemes submitted data to the EDB for the first time should 2000+ or 2020 code.

5.4 Submission of local recaptures and ringing data

In early 2020 the EURING Board agreed to publish the following standards, which are set out at <https://euring.org/data-and-codes/euring-databank>:

Contributing Ringing Schemes are expected to contribute at least the following types of data to the EDB:

- 1 Ringing and final encounter details for all birds ringed in their country and recovered fresh or long-dead, sick or injured.
- 2 Ringing and re-encounter details for all birds re-encountered alive more than 10 km from the ringing place.

In addition, some schemes may also submit:

- 3 Ringing and re-encounter details for all birds re-encountered less than 10 km from the ringing place.
- 4 First encounter details of birds that have not been recovered.

Each scheme is encouraged to follow the guidelines given above. Traditionally, some schemes have defined a lower distance or time limit for reporting live recaptures of birds. A list of schemes' practices is found at <https://eurring.org/data-and-codes/reportable-recovery-definitions>. Each scheme may determine its own lower limit (i.e. below 10km distance) for inclusion of live recaptures in their own database. The EDB will accept all records that schemes decide to include, whatever the lower distance limit may be. Schemes should submit all records for dead recoveries, even where the ringing and recovery location are the same.

The EDB is now able to accept ringing and recapture data for all birds, not only those which have been recaptured or recovered. If ringing records alone (without recovery or recapture data) are submitted, they must be in 2000+ or 2020 code.

5.5 Error checking and feedback to schemes

Software written by Vidar Bakken is freely available from the schemes' private area of the EURING web site. This checks coding in data files in 2000 or 2000+ code. Schemes submitting data in 2000 or 2000+ code should use this software to check data before submission.

Data will be further validated at the EDB before loading into the main EDB database. Some coding errors can be corrected on loading. Typical errors in this category include an incorrect value for unknown data in a particular field, perhaps a U instead of a Z. Other errors cannot be corrected in this way – dates such as 31022007, for example.

A number of consistency checks are also made when data are received by EDB. These include: change in “species concluded” between records of the same ring; a live record of a bird later than a dead record; a record of a ring before the reported ringing date; re-encounter records for a ring without a ringing record. A further set of checks validates location data: the given coordinates should be consistent with the reported place code, i.e. the location indicated by the coordinates must lie within the geographical boundaries of the administrative region identified by the current place code. Note that for historic data, the current place code can be left blank and will be completed by EDB.

Feedback from this validation is sent to schemes, as a number of error reports. For coding errors these will be spreadsheets with comments, where appropriate, on each field. Similarly, for consistency errors, the feedback will be a spreadsheet detailing records with particular errors. On receipt of these reports, schemes have two options:

- 1 If the errors can be corrected easily within a few weeks, that should be done in the scheme's own records, and either a complete new submission or details of the corrections sent to EDB.
- 2 Otherwise, schemes should let the EDB manager know that corrections will not be made immediately, and he will delete inconsistent records and load the remainder to the database. Schemes should use this feedback to help improve the accuracy of their own ringing recovery data sets by correcting erroneous records. These need not be resubmitted until the scheme's next submission (the following year).

5.6 File organisation

As far as the EDB is concerned, the organisation of files is of little importance. Schemes are free to organise their submission data files in the way most convenient to them. A single file containing all records is preferred. A number of types of software such as WinZip and internet services such as WeTransfer are available.

5.7 Extinct schemes and old place codes

Data from old schemes should normally retain the old scheme code. The only exception to this is where a scheme continues, but under a new code. This can happen as a result of political changes. In these cases, the scheme must decide at which point the scheme code changes. It is possible, for example, to change all historical records for the scheme to the new code, provided all birds with that old code were ringed with rings from the same ringing centre.

5.8 Unrecorded/unknown data

The EURING code 2000 provided opportunities for recording variables which are vital for any bird encounter record – the ring number, for instance. However, some fields may be useful for many analyses, but do not carry the same importance as others. These include fields such as the catching method or pullus age. Some schemes ask that ringers record and submit these data, others do not. Where schemes do not record such items, records should be submitted with the appropriate code for unknown or unrecorded (usually U, Z or a hyphen) rather than just leaving a blank character space.

The fields which have been added in the 2000+ and 2020 codes often do not have a value for unknown/unrecorded; missing values are represented by two pipe (|) symbols with no space between them.

5.9 Derived data

The EURING code provides three fields for derived data – distance moved, direction travelled and time elapsed since ringing. For the ringing event, these fields must all contain hyphens, not zeros. Some schemes have found difficulty in calculating the distance and direction fields. These will be calculated by the EDB when the data are loaded. In these cases they should be left as hyphens in the recovery/recapture record.

5.10 Place name, Remarks and Reference fields

These last three fields in 2000+ code have been included to enable use of the EURING Exchange Code for between-scheme recovery processing.

Schemes which are already exchanging recovery data in 2000+ format will have developed export routines which include these three fields. When submitting data to the EDB, schemes can include these three fields if they wish – it makes no difference to the EDB loading process because they will be deleted during the checking and loading process. The important thing is to minimise work for schemes. If it is more convenient to have one routine for exporting data (to other schemes or to the EDB) then it will be simpler to include these fields.

5.11 Biometric data

Data will be welcomed with or without biometric data. It is recognised that biometric data will never be available for some birds (not recorded or submitted by the ringer, old records where only basic ringing data exist on paper etc.). However, biometric data will add considerably to the value of EDB records, particularly where data are being submitted for all birds, not just those with a post-ringing encounter history.

5.12 Submitting foreign recovery and control data

Schemes should submit data only for birds ringed with their own rings, including rings from any subsumed schemes and any foreign encounters of any of these birds. Encounters of foreign-ringed birds should not be submitted because their data will be submitted by the schemes that ringed them. In this way data for all birds will be submitted without duplication of data for birds crossing national borders.

6 RINGING TOTALS: FORMAT AND SUBMISSION

For full analyses of recovery data, it is often important to know ringing totals. For this reason, EURING needs to have a full list of ringing totals for all schemes. The totals available so far are held in the EURING web site and can be found at www.euring.org/data_and_codes/index.html. Eventually it is hoped that these totals will be held in a single database and that schemes will be able to submit or edit data through an on-line application. For the present, however, submission to the EDB will be through spreadsheet or similar data files. It is hoped that schemes will be able to submit their ringing and recovery totals annually, perhaps to coincide with publication of these figures in their annual ringing report.

6.1 Historical ringing totals

Historical ringing totals will exist, for most schemes, only in printed form. Computerising of all these historical totals would be a major task, beyond the resources of ringing centres. Some schemes have succeeded in finding volunteer help for computerisation of historical ringing data. Other schemes are encouraged to find such volunteer help.

6.2 Annual totals or complete data sets?

For submission of recoveries, schemes are asked to submit complete data sets annually. Ringing totals, however, present fewer problems than recovery data. Amendments to past records happen relatively infrequently (perhaps if errors are discovered or if a ringer has submitted details after the scheme's deadline for annual submissions).

The EDB will welcome submissions either of annual totals or, as with recovery data, complete data sets annually. Please state whether any submission consists of new records only, a complete data set or else annual totals and some earlier, corrected records.

6.3 Extinct schemes

Some schemes are curators of data from extinct schemes. The EDB will welcome data from these extinct schemes. Some schemes may have recoded constituent, extinct schemes' data with the modern scheme code (for instance, DFR records now all have the new DER code.) Other schemes have left extinct scheme codes as they were (for instance HGM records remain as HGM). The EDB will accept data with either convention according to schemes' own policies, but please make it clear if extinct schemes' totals have been included with the current scheme's totals.

6.4 Missing data fields

At present, some schemes may not be able populate all the fields. For example, sometimes ringing totals are not broken into 'full-grown' and 'pulli'. In such cases, leave the corresponding spreadsheet data columns blank.

6.5 Submitting data

Send completed totals lists to edb@bto.org either in CSV format or as a spreadsheet file at a time convenient for the scheme.

6.6 Data format

Each line of data will give details of ringing of one species, in one year, by one scheme. Thus, a scheme which has been operating for 20 years and has ringed around 100 species would have about 2,000 lines of information. For examples of formatted data, examine existing data sets on the web site.

The fields which will be included are:

| Field | Notes |
|------------------------|---|
| Scheme | Three letter scheme code |
| Year | Four digits |
| Species | Scientific name |
| EURING species code | Five digits, include subspecies within species totals. |
| Pulli | Number of pulli ringed during that year. |
| Full grown | Number of fledged birds ringed during that year. |
| Grand total ringed | Total number of birds of that species ringed up-to and including those in that year since the scheme began. |
| Recoveries | Total number of recoveries reported during the year, irrespective of year of ringing. |
| Grand total recoveries | Total of all recoveries of that species up-to and including those in that year. |

6.7 Example records

| Scheme | Year | Species | EURING | Pulli ringed | Full Grown ringed | Total ringed | Grand Total ringed | Recovered | Grand Total recovered |
|---------------|-------------|-----------------|---------------|-------------------------|------------------------------|-------------------------|-------------------------------|------------------|----------------------------------|
| GBT | 2006 | Parus major | 14640 | 24995 | 38764 | 63759 | 1549382 | 271 | 9541 |
| GBT | 2004 | Parus major | 14640 | 23637 | 33870 | 57507 | 1423918 | 179 | 8958 |
| DER | 2006 | Regulus regulus | 13140 | 0 | 149 | 149 | 11427 | 2 | 83 |

For complete life histories: XXX Ringing and Recovery data, successfully processed

'XXX' is for the three letters of the EURING code of the scheme transmitting the data.

In a case where ringing data without recoveries has to be sent, the complete life histories format must be used.

Import

Several aspects have to be taken in account to program the import operation:

- detection of duplicates
- adjustment of some fields
- integrity of the field 'reference'

A checking process needs to be introduced to avoid the import of duplicates.

The field 'reference' of the EURING code 2000+ identifies data through the exchange process. In normal cases, this must be left unaltered through the exchange process (see Reference Codes below).

If the reference code is missing checking for duplicate records must be done by examination of these six fields: Scheme, Ring number, Latitude, Longitude, Date, Time. If they all match then the records are regarded as being duplicates.

Co-ordinates and hours may be subject to alteration through handling by partner schemes (see export). Therefore duplicates are not always exactly alike. A tolerance in the co-ordinates of data for which other fields are the same or synonyms will allow detection of altered duplicates. In the checking process, two sites with a difference of up to $0.03^\circ \times 0.03^\circ$ should be treated as identical.

For the purpose of checking for duplicates, the field 'time' with inclusion of minutes is regarded as equivalent to one where they are missing. The same is true for the hours.

For example,

1715 will be regarded as the same time as 17-- and ----

17-- will be regarded as the same as ---- and any valid four-digit time beginning with 17

---- will be regarded the same as any time.

Note that 1759 and 1800 are not equivalent.

All new re-encounters where scheme, ring number and date correspond to existing re-encounters, but not already removed as duplicates following these rules should be checked.

Use of the Reference Codes in data exchange

Detection of duplicates with the reference code is the most efficient way to track them. However, many data are exchanged without it within the EURING schemes. In some cases, encounters can be communicated independently and simultaneously to two different schemes, producing duplicates with two different references. Some rules of thumb have to be followed, to keep the whole data transfer clean. Moreover, duplicates have to be tracked by some way other than the reference code (See under Import).

No new reference number must be added to, or replaced by, a re-encounter obtained through another scheme, whatever is the format of the data – EURING code 2020, on paper or PDF. This is also true for any re-encounter received as a query from a scheme in another format than the exchange code 2020. No reference should be added when sent to a third scheme.

In the case where duplicates have different references from two different schemes, both schemes should agree which reference number will be retained and which must be discarded.

Mistakes

Mistakes can be detected automatically to a certain degree. It is up to the scheme to prevent the import and the spread of mistakes. Further guidance on error detection and avoidance is in chapter 8 of this manual.

Some care is needed to see if communicated mistakes are appropriately handled by the partner scheme. A

query with a wrong ring number for example should not be sent repeatedly without correction.

Development and accreditation

The development phase of newcomers is assisted by a scheme already participating to the network. To improve the quality of the data export of newcomers, the scheme joining the networks sends a set of data to the partner in 2020 code, with the corresponding regular reports. The partner checks if the data are correctly coded and if they can be imported.

To improve data import, the partner sends data in 2020 along with the former reports with which data used to be transmitted. The export in 2020 may also be tested by EDB and by using the EURING code checking program which can be downloaded from the internal area EURING web site.

It is strongly recommended that another member of the network should approve both operations before a new member is admitted to the network.

During the accreditation phase, it is important to check that queries sent in 2020 are answered correctly.

8 DEALING WITH ERRORS

8.1 Introduction

The aim of this chapter is to help schemes understand sources of error in data and thus to help to avoid them. We should be aware, however, that it is most unlikely that we will ever have a data set which is completely error-free. What we must strive to do is ensure the error rate is as low as reasonably possible.

Some errors cannot be detected. For instance, if a person misreads a map reference and the report of finding a bird is inaccurate by a few kilometres, but still within the same named place, that cannot be detected. On the other hand, if the map reference error is large it will take the claimed location into a different region and that error can be detected. Often mis-reporting by members of the public can be detected – for instance the telephone report by a non-native English speaker to the BTO of a 'Sea Eagle' together with its ring number, soon made it clear that the reporter had really intended to say 'Seagull'. Small errors, such as the slightly incorrect co-ordinates, may not be serious for European-wide analyses – an error of a few kilometres will make negligible difference to an analysis concerning many movements of many tens of kilometres. We need to concentrate on the errors which will make a difference to analyses and on frequently-occurring small errors.

8.2 Checking data before loading into the EDB

Vidar Bakken has generously written software for EURING schemes to validate records in EURING 2000 or 2000+ formats. This software is freely available from the EURING web site. In addition to checking for valid characters and codes, it also checks for inconsistencies within recapture histories and ensures that co-ordinates match the region codes reasonably well. It also checks that a recapture encounter has a later date than the ringing encounter for a bird. Very few detectable errors are not found by this program. When any gaps are found in the checking program, then it will be adapted to deal with them. Schemes which submit data in EURING codes 2000 and 2000+ are strongly encouraged to use the program and correct errors before data submission. This will, naturally, help improve the accuracy of their own data sets in addition to that held in the EDB.

When data are received by the EDB, a further, independent validation program is run which examines each record for invalid codes. These are, where possible, corrected and reported back to the schemes. No attempt is here made to link records of the same individual to look for inconsistencies in its history. This checking is described in section 5.6

8.3 The commonly occurring errors

Experience with ringing and recovery data has shown some particular types of error occur relatively frequently. This guide is not exhaustive, and it is likely that new types of error will arise from time to time, but is aimed at helping schemes to prevent erroneous data occurring. The types of error which occur most frequently depend on the software used by schemes for handling data. Spreadsheets are notorious for generating various formatting errors, whereas bespoke software may just generate systematic errors through a bug in programming. Most of the errors described will be detected by the EURING checking software but it is much better to avoid introducing the errors in the first place.

Spreadsheets are also dangerously effective at replicating errors when either the Copy & Paste or the Fill functions are used. If the initial cell is incorrect, all dependent cells will also contain the same error.

On the other hand, spreadsheets now have an excellent filter function which can be used to track invalid characters. For instance, filtering the Verification field will list all the different codes used in the sheet. If anything but 0,1 9 appears in the list then there is an invalid character present. By selecting these invalid characters in the filter, the offending records can be found and corrected.

The notes below list the most commonly occurring types of error. After the first section on invalid characters, sections follow in the order of fields in the 2000+ code manual.

Incorrect or invalid characters

Specific incorrect characters appear frequently in some fields and these are noted below. Note that the space character (ASCII code 32) is never allowed in any of the fields except the Place name and Remarks which are only used in recovery processing and are not stored in the EDB. All these errors can, very easily, be detected by simple validation checks.

Confusable characters

Some characters appear very similar to others – number 0 and capital letter O; or number 1, capital letter I and lower case letter l, for instance. Where these are used as codes (e.g. in Catching method O is valid but 0 is invalid) the error can be detected. In some other cases, such as the ring number, the error cannot be detected. For instance OI23456 and 0 123456 are both valid even though only one may be correct in a particular case. Even when they are coded in 2000 format as OI...23456 and ...0123456 they remain valid ring numbers and will not be detected by European-wide validation software (although are likely to be detected by the scheme issuing the ring).

Commas in place of dots

In biometric fields where data include fractional values, the decimal must be indicated with a dot. In many European countries, a comma is used to separate the integer from the fractional parts – this should be converted to a dot when submitting data. The comma is not valid in any field (except Place Name).

Lower case letters

Except for the three fields **Place name**, **Remarks** and **Reference** lower case letters are never valid.

Codes for unknown data

Often a code is needed to indicate that some value is either unknown or unrecorded. For various historical reasons, the code for 'unknown or not recorded', is different in some fields from others. In any particular field, the manual makes the required code clear. Sometimes, however, the wrong codes are still used. For example For Manipulated (column 30) the code for unknown is U; for Catching Method (column 32) it is Z; for Condition (column 77) it is 0 and for Circumstances (columns 78-79) it is 99. A common error is to use an incorrect unknown code for a particular field. Sometimes the letter O is used in place of the digit 0.

Ring

The EURING code specifies a particular format for ring numbers. In general, the leading letters must be separated from the trailing numbers by dots, making the whole number 10 characters in length. Thus ring TC61417 should be given as TC...61417 There have been many similar mistakes including, for example, ...TC61417, TC6...1417.

In some cases leading zeroes are missed. Thus TC06 146 might be represented as TC....6146 rather than TC...06 146. Sometimes, conversely, a leading zero may be recorded as the letter O. Thus TC06 146 becomes coded as TCO...6146.

Species

There are two problems which occur frequently with species codes.

Missing leading zeros

This can be a problem, particularly with data exported from spreadsheets. Where codes are numeric and begin with zero, even if correctly formatted on the screen, they may be exported as an integer in its usual format without a leading zero. For example species code 00 420 would be exported as just 420.

Occasionally, they are exported as real numbers given to two decimal places. Species 00 420 then becomes 420.00

Species not determined on finding

Often when a member of the public finds a bird, the species is not reported. In this case the first species code in the recovery record should be 00 000 – for reported species unknown. However, the ringing scheme **does** know the species of the bird – it is the species given by the ringer when it was ringed. In the recovery record, the second species code, Species as Determined, must be this known species and not the unknown code 00 000. The Species as determined code should never be 00 000.

Sex

Some schemes are submitting data in 2000 code but still using the 1979 sex codes of 0, 1 or 2 for U, M or F. Sometimes lower case letters have been used in place of capitals, giving f or m rather than F or M.

Age

The two age fields are both to be used as a statement of the age of a bird as revealed by its plumage and not by its encounter history. Thus a male Blackbird retrapped by a ringer in December with new, black primary

coverts must be recorded as Age 4 even if it is known that it had been ringed, say, five years previously. This is because all we can determine from the plumage is that it is not a bird hatched in that calendar year. Calculation of ages in years is a job to be done by the analyst, not by the ringer nor ringing scheme. This error is easily detected – age codes which use letters rather than numbers will be very few indeed. For most passerines, age codes higher than 6 are not possible.

Where the Age as reported is found to be wrong (for example, a Robin reported as age 5 in January which had been ringed in January of the previous year) the scheme must give an appropriately changed code in the Age as concluded field. (see page 15 for examples).

Status incompatible with brood codes

Surprisingly this is one of the most common errors in data submitted to the EDB.

If the record is of a pullus then the Status field must be a hyphen. In this case the three nestling-related fields (Brood size, Pullus age, Accuracy of pullus age) must have codes relevant to nestlings which do not have hyphens. On the other hand, if the bird is full grown the status code cannot be a hyphen but the three nestling-related fields must have hyphens only. The rule is, therefore, simple: There must be a hyphen for the status field or else hyphens for Brood size, Pullus age and Accuracy of pullus age. This is made clear in the examples below with three pairs of codes – in each case the first is incorrect and the corrected version follows.

| Age | Status | Brood | Pullus age | Pullus Age Accuracy | Comment |
|-----|--------|-------|------------|---------------------|--|
| 1 | K | 03 | 10 | 4 | Incorrect Status – bird is pullus |
| 1 | - | 03 | 10 | 4 | Corrected status code |
| 4 | - | 00 | 99 | U | Incorrect status and pullus codes – bird is adult so status should be U and pullus codes all should have hyphens. |
| 4 | U | -- | -- | - | Corrected pullus codes |
| 5 | U | 00 | 99 | U | Incorrect pullus codes – bird is adult so all should have hyphens |
| 5 | U | -- | -- | - | Corrected pullus codes. |

Note that if a bird is ringed as a pullus and recovered as a free-flying bird, the pullus-related codes in the recovery record will be hyphens.

Date

Impossible dates

Occasionally records have dates, such as 31 June 2000 (31 062000), or 29 February 1957 (29 021957) which cannot exist. These often result from simple typing errors, but they should be detectable with simple validation software and will be found by the EURING checking program.

Millennium bugs

Sometimes dates which have been converted from 1979 coded data with two digits for the years have the first two digits (19 or 20) omitted leaving two blank characters which are invalid (e.g. '43' is represented as ' 43'). In some cases, particularly for schemes where the recovery data set stretches back over 100 years, the conversion has led to the quoted year being wrong by 100 years. This can lead to birds ringed in 1999 apparently being recovered in 1901. Schemes which find recovery histories with an elapsed time of over 100 years, or a negative elapsed time, will need to convert some old records 'by hand'.

Problems generated by spreadsheets

Where records have been manipulated in a spreadsheet, the year can be exported in a format which is completely different from that on the computer screen. Spreadsheets store dates as the number of days that have elapsed since a chosen start date – for some versions of Excel the start date is 01/01/1900. Thus a date of 01/03/2008 will be stored as the integer 39 508. Sometimes exported dates will be this number, at other times dates might be exported in some other non-EURING coded format. This can be overcome, to

some extent, by formatting the Excel columns to hold text, rather than numeric, values. Be careful, however, data imported may lose formatting when imported into a spreadsheet.

It is safer when using spreadsheets to hold ringing data to use three columns for the date – one each for Day, Month and Year. These will be treated by the spreadsheet as integers and no attempt will be made by the spreadsheet to mis-format them.

Co-ordinates

Simple typing errors can introduce invalid co-ordinates, but there are many other, more subtle, ways of introducing errors. Many schemes store their data in their own national co-ordinate system. These data must be converted to geographical co-ordinates before submission.

Again, spreadsheets can lead to many errors. The new fields, Longitude and Latitude, are far less prone to these errors but they can still be made in connection with places near the Greenwich Meridian and by confusing decimal points of degrees with minutes and seconds.

Leading zeros

Similar problems may arise as for species codes – leading zeros can be lost. Thus an easting of 000°53'00" entered as 0005300 will be given as 5300.

If minutes are entered as a separate field and leading zeros lost, co-ordinates such as 53°08' will become 53°8' and from there be treated as 538 rather than 5308.

Adding latitude and longitude

Additional problems can arise if all the co-ordinates are treated as one field. In this case the spreadsheet may treat the co-ordinates as an arithmetic addition or subtraction so the valid co-ordinates entered as +531800-0011830 would be represented as 519970.

Decimal points of degrees

Another common error is to give decimal points of degrees rather than degrees, minutes and seconds. Thus 53°45' would appear as 5375 because $45' = 0.75^\circ$. Some such errors can be detected by simple validation but where the decimal part is below 0.60 they cannot be detected directly.

The Greenwich Meridian

Particular care is needed for places near the Greenwich meridian where co-ordinates change from negative to positive. National grid systems often do not use negative co-ordinates which causes problems when converting to geographical co-ordinates.

Negative co-ordinates (West and South)

Care must be taken to ensure that negative co-ordinates (i.e. west and south) have degrees, minutes and seconds all treated as negative. Consider, for example, the longitude co-ordinate 2°15'40"W. In EURING code it becomes -0021540. If this is split into separate fields in a spreadsheet, it would be all too easy to manipulate this as $-2^\circ + 15' + 40''$ instead of $-2^\circ - 15' - 40''$ with the negative sign properly applied to each field.

9 CONVERSION FROM EURING 1979 CODE TO 2000 CODE

These notes are an updated and corrected version of the notes written by Arie J. van Noordwijk of the Netherlands Institute of Ecology for the EURING General Assembly in Chemnitz, 2003. Thanks are due to Arie for the production of the initial draft and also to staff in various ringing schemes in Europe who have contributed to the improvements in the document with their queries and suggestions.

Some amendments result from changes and clarifications to the EURING 2000 code, others are corrections of errors. These notes have been included primarily to help analysts understand features of older records which have been converted from 1979 code. The change through to 2000+ code is then the addition of biometric fields and separation of fields by the pipe character which has no further impact on the 1979 to 2000 changes.

Chris du Feu, July 2014.

Preface to the 2003 version

To the EURING general assembly in Chemnitz 2003.

This document is intended to spell out and define the conversion from EURING 1979 code to the 2000 code. Most of the conversion is straightforward, since in general, the codes in the fields have not changed. However, in a number of cases, the old code had combined fields that need to be split and in several cases new information is taken up. There are two main points that should be discussed at the EURING General Assembly.

- 1 In one or two cases, the new code distinguishes two or more categories within a single previous code. e.g. the new field Primary identification method [4-5] takes information from previous column {18}. The old code 7 is equivalent to the new codes C, D,R or T. Option one is to widen the definition of one of the codes to include uncertain whether C,D,R or T (in this case I would suggest to do this with T) or option two is to create a new category (code) for colour marks other than colour rings without metal ring. This code will then only be used in old records and every analyst has to be careful (as always) for patterns of code use over time.
My recommendation is option two.
- 2 Converting the discrepancy in observed species between ringer and finder. In the old system there is one field for species and a field for discrepancy. In the new system there are four fields with species information (remember that every old record leads to two records in the new code). Two on record zero (the ringing occasion) and two on record one (the reporting occasion). In both cases there is a field for species observed and one for species concluded. If ringer and finder agree, all four species codes should be the same. If they disagree, then species observed and concluded on record zero and species concluded on record one should be the same and be the same as the species in the old code. There are two options of how to handle the species observed on record one in case of disagreement:
The first option is to back-translate the information in the old agreement column and to fill out the genus species code or the family species code for the species concluded. This is a lot of work, since the species code is not hierarchical. The alternative is always to code species observed as 00000 unrecorded if there is a discrepancy, regardless of whether the discrepancy is at the genus or family level. In practice, many discrepancies stem from misreported ring numbers (reading or typing errors) and in that case the level of discrepancy is irrelevant. Discrepancy about subspecies is relatively easy, because subspecies differ only in the last digit. Reconstructing the observed subspecies should be done by using the species code ending in 0 as the species observed.
My recommendation is to use the alternative option.

When these two points are decided, there should not be any more problems in the conversion.

Arie van Noordwijk

Introduction

This document is intended to describe the conversion from EURING 1979 code to the 2000 code. Most of the conversion is straightforward, since in general the codes in the fields have not changed. However, in a number of cases, the old code had combined fields that need to be split and several cases new information is taken up.

In following the instructions, it has become apparent that some amendments were required. These are incorporated in this version. They have been discussed by the EURING Board and the Data Management Committee. It is expected that, as more schemes proceed with code conversion, the need for further amendments will become apparent.

General Issues

The old (1979) EURING code was based on the assumption that the typical history of a bird was being ringed and being recovered. Each record contains, essentially, four blocks of information: 1) identification of the individual, 2) details of ringing, 3) details of finding, 4) several items on the connection between 2) and 3) dealing with quality of the data and with derived data.

For a number of reasons (see below) this system has been changed to a system where one record refers to one encounter with an individual. Thus, one record in the 1979 code leads to two records under the 2000 code. These records will be the same for the information in part 1, the information on the identity of the individual and the equivalent information on ringing and on finding will be found in the same fields in the first and the second record. These three blocks will in general give few problems in conversion. In the fourth block of information there are a few points where conversion could be done in different ways, here solutions to these problems are described. Here we use **record zero** for the record referring to the (first) ringing encounter and **record one** for any subsequent encounter.

Changes in philosophy underlying the code changes

The 1979 code is based on the typical situation of birds being ringed and then subsequently being recovered dead. Although this type of data is still accumulating, an ever greater proportion of data concerns birds being ringed and then repeatedly being observed alive. In the 1979 code this required a duplication of the ringing information in each record. However, there are more basic changes in philosophy.

One is that a EURING code record for a bird ringed but never recovered led to problems, because some of the fields were combinations of observation and correspondence between the observations at ringing and at recovery. In the 2000 code, every record can be fully coded before any subsequent information has been gathered.

Further there is a great need for more detailed information on methods used, both at the time of ringing and at the time of recapturing or recovering. Several new fields have been introduced for this purpose and at the same time the code has become very suitable for animals identified individually by other means such as radio or satellite tracking, transponder readings etc. where many observations on a single individual are the normal case.

Notation

O is used for the letter and 0 for the digit zero in all code descriptions. Fields in the 1979 code have been indicated by {**xx**}. Fields in the 2000 code are indicated by [**xx**], in bold.

Each EURING 1979 code record leads to two records in the 2000 code. The term record zero is used for the ringing event and record one for any later event. Where multiple records of the same individual already exist, duplicate records zero will arise that should be identical and should be removed.

There is no sequential code to indicate how many encounter events a bird has undergone. However, sorting by date and by time will give a temporal order of encounter. One of the reasons is that records already coded will not have to be changed if at a later time an earlier record emerges.

Conversion, field-by-field

Scheme [1-3]

Both in record zero and record one:

Equivalent to col. 1-3 in 1979 code. No conversion necessary. Where a scheme code has changed, leave the old codes as they are and use new codes for new records.

Primary identification method [4-5]

Both in record zero and record one:

This is a new field.

| <i>{18}</i> Factors | [4-5] Primary Identification Method |
|---------------------|-------------------------------------|
| 3 | D0 |
| 5 | B0 |
| 7 | T0 |
| all other codes | A0 |

Identification number [6 – 15]

Both in record zero and record one:

This field was extended from 8 to 10 columns. In conversion two extra dots should be placed following the rules for placing dots.

The main rule is that the code is always right justified, when there are letters followed by figures, dots are placed between the letters and the figures, with multiple letter and figure groups, dots are placed left of the rightmost group of figures. For any code already containing dots, two dots should be added to the dots already present. Examples are given in the code manual.

Verification of metal ring [16]

In record zero:

Use code 0 for all records.

In record one:

Use a conversion of *{17}*.

0, 2,4,6,B, D, F and any invalid or missing values become 0.

1,3,5,7,A, C, E become 1

The distinction between the old codes *{17}* is expressed in the matching of the fields species as reported and species as concluded by the scheme, see field [25-29]

Metal ring information [17] and other marks [18 – 19]

For record zero:

| Condition | <i>{18}</i> | [17] | [18 – 19] |
|--|-------------|------|-----------|
| Metal ring on tarsus or unknown position | 0 | 1 | ZZ |
| Metal ring on tarsus | 1 | 2 | ZZ |
| Metal ring above tarsus | 2 | 3 | ZZ |
| Not normal metal leg ring, no colour rings | 3 | 0 | OM |
| Colour ring and metal ring | 4 | 1 | BB |
| Unique colour ring mark, no metal rings | 5 | 0 | BB |

| | | | |
|--|------------|---|----|
| | | | |
| Other colour mark and metal ring | 6 | 1 | MM |
| Unique other colour marks, no metal ring | 7 | 0 | OM |
| Human interference at ringing | any letter | 1 | ZZ |

For records one:

| Condition | {18} | [17] | [18 – 19] |
|--|------------|------|-----------|
| Metal ring on tarsus or unknown position | 0 | 4 | ZZ |
| Metal ring on tarsus | 1 | 4 | ZZ |
| Metal ring above tarsus | 2 | 4 | ZZ |
| Not normal metal leg ring, no colour rings | 3 | 0 | OM |
| Colour ring and metal ring | 4 | 4 | BC |
| Unique colour ring mark, no metal rings | 5 | 0 | BC |
| Other colour mark and metal ring | 6 | 4 | MM |
| Unique other colour marks, no metal ring | 7 | 0 | OM |
| Human interference on recapture | any letter | 1 | ZZ |

Note that the letter codes P, R, M, T, F, C, H from {18} go into [30]

Species (or subspecies) as reported [20-24]

Both in record zero and in record one:

Use the same codes as the previous {12-16}.

Codes A, B, C, D, E, F in old {17} should be coded as 00 000 in field [20 – 24] in record one.

Species as concluded [25 – 29]

When the old {17}, Verification contained the codes 0,1,4,5,6,7 the species code in this field should be identical to both the species code in the field [20 – 24] and the species code in both field [20 – 24] and [25 – 29] of the record zero and record one.

When the old {17} contained code 2 or 3, (and in some cases 6 or 7) the species code here should be contained in the species code reported.

Many species codes (ending in 9) have been created for groups of birds species recognised by the reporting public.

When the old {17} contained the codes A, B, C, D, E or F there should be a discrepancy in the species codes between species reported and species concluded.

In general, the species concluded should be the species reported by the ringer.

Codes A, B, C, D, E, F in {17} should be coded 00 000 in field [20 – 24] in record one.

Manipulation [30]

For record zero:

If {18} has any alphabetic code, use that. If {18} has a numeric code then, use N for normal, non-manipulated bird. If {18} has any other code use U for unknown.

For record one:

Use code 0 for all records.

Moved before capture/recapture/recovery [31]

In general, *record zero* will be 0.

For record one:

Use the information from previous {67}.

| {67} Finding circumstances | [31] Moved |
|----------------------------|------------|
| 0, Z | 0 |
| 2, 3, B, C | 2 |
| 4, 5, D, E | 4 |
| 6, 7, F, G | 6 |

Catching method [32]

Both in record zero and record one:

This is a new column and should be Z (=unknown) in conversion, unless additional information is added.

Lures used [33]

Both in record zero and record one:

This is a new column and should be U (=unknown) in conversion, unless additional information is added.

Sex reported [34] and Sex concluded [35]

This field takes its information from previous {19}, which was a combined code for sex and its verification, which is the agreement between ringer and finder.

| {19} Sex | Previous Meaning | | Record 0 | | Record 1 | |
|----------|------------------|--------|-------------------|--------------------|-------------------|--------------------|
| | Ringer | Finder | [34] Sex reported | [35] Sex concluded | [34] Sex reported | [35] Sex concluded |
| 0 | U | U | U | U | U | U |
| 1 | M | U | M | M | U | M |
| 2 | F | U | F | F | U | F |
| 3 | U | M | U | U | M | M |
| 4 | U | F | U | U | F | F |
| 5 | M | M | M | M | M | M |
| 6 | F | F | F | F | F | F |
| 7 | U | U | U | U | U | U |
| 8 | M | F | M | M | F | M |
| 9 | F | M | F | F | M | F |

Note 1. The previous codes 7, 8 & 9 cannot be translated exactly. The transformations given here are exact as to their conclusions and suppose the most common case, where the sexing of the ringer is thought to be more reliable than that of the finder. However, if record one refers to a live recapture of a bird ringed as a pullus or juvenile, the sex of the finder may thought to be more reliable. In those cases the codes 1 and 2 in records zero and one should be reversed.

Note 2. A choice has to be made between two strategies: A) only information available at the time of the observation in the record is included in that record. Later information is not added and hence the person using the information should refer to the latest record of that individual. B) Later information is added. Under this strategy, [35] in record zero should become 1 and 2 for codes 3 and 4 in previous {19}. Strategy A is strongly recommended and adopted in this conversion table.

Age reported [36]

For record zero:

The information comes from {20} codes are the same.

For record one:

The previous system did not allow an age observation, thus in converting records code 0, for unknown should be used.

Age concluded [37]

This field has been added to allow the scheme to include a judgement whether the observer is capable of assigning the observed age. **It is not intended to include calculated ages.** Thus in converting records, the code should be equivalent to [36] in record zero and should be 0 in record one.

Status [38]

This is a new field which takes the information from part of {21} in record zero and part of {69} in record one.

For record zero:

This field should be hyphen (-) if the age is 1 (pullus) see [39 – 40].

If the age is not 1, then codes M – W are copied from {21}. Code O (or 0) becomes code U.

If the bird is not a pullus and {22} has value 5-8 inclusive (moulting flight feathers), then use the new code T when this field has no value other than unknown.

For record 1:

Use the information in {69} and, sometimes, {70} according to the table below.

| Status when found | {69} Status | Record 1, [38] |
|---------------------------------------|----------------|--|
| Nesting | 1, A, N | N |
| Roosting assemblage | 2, B, R | R |
| In colony | 3, C, K | K |
| Moulting assemblage | 4, D, M | M |
| Local but not breeding | 5, E, L | L |
| Wintering | 6, F, W | W |
| On passage (including at lighthouses) | 7, G, P | P |
| At sea | 8, H, S | S |
| Unknown, unrecorded | any other code | U or T if {70} has value in range 5-8 (moulting) |

Brood size [39-40]

This new field takes the information from part of {21}.

For record zero:

If age [36] is 1 (pullus) then old codes 1-9 become 01-09 and codes A-H become 10-17. Code O (or 0) becomes 00.

If age is not 1, this field must be -- (two hyphens).

Note: code J (more than 18 in brood, or brood from more than one female) becomes 99 on conversion unless more information can be added from other sources. In that case, J will translate to the number of pulli alive or 50+number of pulli alive in the case of broods from more than one female.

For record one:

In general, this field will be -- (two hyphens).

Pullus age [41-42]

New field takes the information from part of {22}.

For record zero:

Code O or 0 becomes 99 (unknown).

If age is not 1 (bird is not a pullus) then use code -- (two hyphens).

If age is 1 (bird is a pullus) and {22} has codes A-Z then use the table below for codes to be used in [41 – 42]

| {22} Pullus age | {23} Accuracy of pullus age | | |
|-----------------|-----------------------------|------|------------------------|
| | L, T | N, V | M, P, Q, R, U, X, Y, Z |
| A | 01 | 03 | 02 |
| B | 04 | 06 | 05 |
| C | 07 | 09 | 08 |
| D | 10 | 12 | 11 |
| E | 13 | 15 | 14 |
| F | 16 | 18 | 17 |
| G | 19 | 21 | 20 |
| H | 22 | 24 | 23 |
| J | 25 | 27 | 26 |
| K | 28 | 30 | 29 |
| L | 31 | 33 | 32 |
| M | 34 | 36 | 35 |
| N | 37 | 39 | 38 |
| P | 40 | 42 | 41 |
| Q | 43 | 45 | 44 |
| R | 46 | 48 | 47 |
| S | 49 | 51 | 50 |
| T | 52 | 54 | 53 |
| U | 55 | 57 | 56 |
| V | 58 | 60 | 59 |
| W | 61 | 63 | 62 |
| X | 64 | 66 | 65 |
| Y | 67 | 69 | 68 |
| Z | 70 | 72 | 71 |

For record one:

In general, this field will be -- (two hyphens).

Accuracy of pullus age [43]

New field takes the information from part of {23}.

For record zero:

If [42] is 99 then use U (unknown), otherwise refer to the table.

| | | | | |
|------------------------------------|------------------|------|------|------|
| {23} Accuracy of pullus age | L, M, N, T, U, V | P, X | Q, Y | R, Z |
| [43] Accuracy of pullus age | 0 | 1 | 7 | 9 |

Note that the new system allows for a greater number of coding possibilities than did the old system.

For record one:

In general the bird is not a pullus and this field will be - (one hyphen).

Date [44-51]

For record zero: this field takes the information from *{24 – 29}*.

For record one: this field takes the information from *{44 – 49}*.

Note that the year sub-field has been expanded from 2 to 4 columns, so, for the majority of old records '19' should be inserted in columns [47 – 48]. Records since 2000 will need '20' to be inserted in these columns. Exercise great care when converting records over 99 years old using software.

Accuracy of date [52]

For record zero: the information is copied from *{30}*.

For record one: the information is copied from *{50}*.

In both records, the old value of 11 should be coded as 9.

Time [53 – 56]

This is a new field. Converted records should be coded as ---- (four hyphens) in both record zero and record one unless a time was given as part of the Inaccuracy of Date fields (alphabetic characters in *{30}* or *{50}*).

For these records times should be coded as in the table below.

| <i>{30} or {50}</i> | [53 – 60] Time | <i>{30} or {50}</i> | [53 – 60] Time | <i>{30} or {50}</i> | [53 – 60] Time |
|---------------------|----------------|---------------------|----------------|---------------------|----------------|
| A | 00-- | J | 08-- | S | 16-- |
| B | 01-- | K | 09-- | T | 17-- |
| C | 02-- | L | 10-- | U | 18-- |
| D | 03-- | M | 11-- | V | 19-- |
| E | 04-- | N | 12-- | W | 20-- |
| F | 05-- | P | 13-- | X | 21-- |
| G | 06-- | Q | 14-- | Y | 22-- |
| H | 07-- | R | 15-- | Z | 23-- |

Place code [57 – 60]

For record zero: this field takes the information from *{31 – 34}*.

For record one: this field takes the information from *{51 – 54}*.

New codes have been (and will be added) but previous codes remain unchanged.

Geographical co-ordinates [61-75]

For record zero: this field takes the information from *{35 – 42}* & *{43}*

For record one: this field takes the information from *{55 – 62}* & *{63}*

The coding system has changed in several ways:

- a) the previous system worked with quadrants and 4 characters for degrees and minutes. The new system works with 6 characters for degrees, minutes and seconds for latitude and 7 characters for longitude.

- b) the old system used punch codes 11 or 12 for unknown digits. In the new system, the best estimate should be given and the accuracy coded in field [76].

The quadrant, {43} & {63}, for records zero and one respectively, must be converted to signs of latitude and longitude according to the table below.

| {43} and {45} Quadrant | [61] Sign of latitude | [68] Sign of longitude | [69] First digit of longitude |
|---------------------------|--------------------------|---------------------------|----------------------------------|
| C | + | + | 1 |
| E | + | + | 0 |
| A | - | + | 1 |
| S | - | + | 0 |
| H | + | - | 1 |
| W | + | - | 0 |
| P | - | - | 1 |
| U | - | - | 0 |

Full description of conversions

| New column | Field | Record zero | Record one |
|------------|-------------------|-------------------------|-------------------------|
| [61] | Sign of latitude | from {43} (table above) | from {63} (table above) |
| [62] | Latitude degrees | {35} | {55} |
| [63] | Latitude degrees | {36} | {56} |
| [64] | Latitude minutes | {37} | {57} |
| [65] | Latitude minutes | {38} | {58} |
| [66] | Latitude seconds | 0 | 0 |
| [67] | Latitude seconds | 0 | 0 |
| [68] | Sign of longitude | from {43} (table above) | from {63} (table above) |
| [69] | Longitude degrees | from {43} (table above) | from {63} (table above) |
| [70] | Longitude degrees | {39} | {59} |
| [71] | Longitude degrees | {40} | {60} |
| [72] | Longitude minutes | {41} | {61} |
| [73] | Longitude minutes | {42} | {62} |
| [74] | Longitude seconds | 0 | 0 |
| [75] | Longitude seconds | 0 | 0 |

If there are non-digit codes (usually hyphens) in any of the numeric fields, these should be replaced by 0 and one of the codes 3, 4, 5 respectively should be used in field [76] when there are one, two or three missing digits in either latitude or longitude.

Accuracy of co-ordinates [76]

For most converted records [76] becomes 1, accurate to about 5 km. If there are some digits of the co-ordinates missing then use values given above.

Condition [77]

For record zero: this field is always 8.

For record one: this field is a copy of {64}.

Circumstances [78-79]

For record zero: this field is always 20.

For record one: this field is a copy of previous cols. {65 – 66}.

Circumstances presumed [80]

This field contains part of the information from {67}.

For record zero: this field becomes 0.

For record one: codes A, C, E, G, 1,3,5,7 become 1; all other codes become 0.

EURING code identifier [81]

In both *record zero* and *record one*: use code 3 (translated from older codes).

Distance [82-86]

For record zero: use ----- (five hyphens).

For record one: convert from {71 – 74}.

The 2000 code uses 5 digits for distance in place of 4 digits in the 1979 code.

Distances in the range 0000 to 9999 inclusive remain unchanged, but will be preceded by an extra 0.

Distance above that will have codes A to L changed to 11 to 20 respectively.

Note that in many cases, records in 1979 code did not have distances or directions calculated. In such cases either give record one five hyphens (as for the record zero) or else calculate the distance according to the instructions in the EURING 2000 code manual. Distances can be calculated by the EDB.

Direction [87-89]

For record zero: use --- (three hyphens).

For record one: copy from {75 – 77}.

Note that the same comments apply to Direction as do to Distance [82 – 86], above. Uncalculated directions in record one must be given as three hyphens.

Elapsed time [90 – 94]

For record zero: use ----- (five hyphens).

For record one: recalculate the elapsed time from the dates of the original 1979 coded record, {24 – 29} and {44 – 49}. It is important that the elapsed time be calculated: it must not be left as hyphens. This is one way of distinguishing a subsequent encounter record from the original ringing record (which will always have hyphens in this field).

Biometrics reserved columns [151-200]

These fields should be empty, making the record length for all records 94 characters.

Relationship between fields in 1979 and 2000 codes

| EURING 1979 Code | | EURING 2000 code | | |
|------------------|----------------------------|------------------|--------------------------------|--------------------------|
| Fields | Full Record | Fields | Record Zero | Record One |
| 1 – 3 | Scheme | 1 – 3 | Scheme | |
| 4 – 11 | Ring number | 6 – 15 | Ring number | |
| 12 – 16 | Species | 20 – 29 | Species reported and concluded | |
| 17 | Verification | 16 | | Verification |
| 18 | Factors affecting recovery | 30 | | Manipulation |
| 19 | Sex and verification | 34 – 35 | Sex (reported/determined) | |
| 20 | Age | 36 – 37 | Age (reported/determined) | |
| 21 | Status & brood size | 38, 39 – 40 | Status or Brood size | |
| 22 | Moult & Pullus age | 38, 41 – 42 | Status or Pullus age | |
| 23 | Plumage/accuracy PA | 43 | Accuracy of pullus age | |
| 24 – 29 | Ringing date | 44 – 51 | Date | |
| 30 | Date accuracy | 52 | Accuracy of ringing date | |
| 31 – 34 | Ringing place code | 57 – 60 | Place | |
| 35 – 42 | Ringing co-ordinates | 61 – 76 | Co-ordinates | |
| 43 | Ringing quadrant | 61 – 76 | Co-ordinates | |
| 44 – 49 | Recovery date | 44 – 51 | | Date |
| 50 | Date accuracy | 52 | | Accuracy of ringing date |
| 51 – 54 | Recovery place code | 57 – 60 | | Place |
| 55 – 62 | Recovery co-ordinates | 61 – 76 | | Co-ordinates |
| 63 | Recovery quadrant | 61 – 76 | | Co-ordinates |
| 64 | Finding condition | 77 | | Condition |
| 65 – 66 | Finding circumstances | 78 – 79 | | Circumstances |
| 67 | Various | 31 | | Moved |
| 68 | Previous reports | 4 – 5 | Identification method | |
| 69 | Status when found | 38 | | Status |
| 70 | Moult | 38 | | Status |
| 71 – 79 | Derived data | 82 – 94 | | Derived data |

10 UPDATE HISTORY

This chapter contains details of all changes to the EURING2000+ code which have been made since the issue of Version 116 in April 2015 except for additions of Species, Place, Scheme and Circumstance codes. When new codes for these four fields are issued, they are immediately included in the on-line tables.

This list includes changes from 2000+ to 2020 code.

In addition to these changes in codes, a number of detail changes have been made to the text to increase clarity and coherence.

Changes are listed in the order of fields in this manual.

Other Marks Information

Code unchanged but additional instruction for birds with more than one type of other mark.

Species (and mentioned and as determined)

Codes remain as for 2000+ but species names held in the on-line tables updated.

Age as determined

Further clarifications added including a note on age codes for nidifugous (precocial) species where the young are not yet fully flight-capable.

Status

Clarification added about order of priority of codes.

Place Code

Codes remain unchanged but this field is now to be used solely for the code of the place at the time of the encounter.

Geographical Co-ordinates

Codes remain unchanged but should be replaced given as a default of 15 hyphens, -----, if the new fields **Longitude** and **Latitude** are used.

Accuracy of Co-ordinates

Existing code remains unchanged but an alternate, alphabetic, code can be used which can be used to give more precision to the co-ordinate accuracy.

Circumstances

Exemplifications given for code 48 Accidental recovery through active human activity.

Reference

This field was initially used in connection with between-scheme recovery processing. This field can be used where schemes already give each encounter record a unique identification code. Note that to make the record unique within the EDB it will need to be prefixed with the scheme code.

Latitude

A new field which, with **Longitude**, can be used in place of **Co-ordinates**.

Longitude

See above.

Current Place Code

A new field to be used where administrative or political boundary changes make the **Place Code** at the time of the encounter obsolete.

More Other Marks

A new field to hold information about additional marks where more than one type are used.