FLAMINGO STUDY

Volume II

Standardized ring resightings and data collection

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AIMS OF THE FLAMINGO STUDY

The Greater flamingo study is a long-term project aimed at reaching an understanding of the behaviour, demography and ecology of the Camargue and West Mediterranean population of flamingos. This is done to a large extent by monitoring their numbers (breeding season, winter) and by studying their breeding biology, breeding success, survival and mortality through the resightings of individually ringed birds (see FLAMINGO STUDY VOLUME I).

Every resighting can contribute to several aspects of the flamingo study, for instance:

- Survival. This is estimated on a 6-month to annual basis and requires observer effort in both winter and summer. Survival can be estimated in relation to a) body condition at ringing b) sex, age and cohort c) wintering/summering areas and d) weather conditions etc…

- Distribution and movements. Ring re-sighting across the range of the species allows to describe migration and dispersal patterns but also to explain the process causing variations among the individuals in their movement strategy. Cohort differences and between year differences 1) outside the breeding season and 2) during the breeding season: a) colony attendance and recruitment in Camargue, Spain, Mauritania etc. b) feeding range and c) summering areas of not breeders.

- Breeding biology. Ring re-sighting at the breeding colony allow a detailed understanding of breeding parameters, e.g.

- plumage development
- age structure of breeding colony
- laying dates, breeding success, incubation shifts (age and cohort differences)
- breeding success in relation to nest location
- re-nesting rates (important for calculations of colony size)
- understanding display (timing and functions)
- chick survival in the crèche (from observations of ringed adults feeding chicks)
- various aspects of behaviour (parent-chick recognition etc.)
- duration of pair-bonds
- chick development
- crèche dynamics

RECORDING RING RESIGHTINGS IN GENERAL

The Flamingo study depends to a very large degree upon individual recognition of flamingos and it is therefore imperative **that ring codes are correctly read**. A ring inscription which the observer is not sure of must never be recorded. It is equally important that mistakes are not made when observations are copied or entered into the computer.

Observers must be familiar with the different types of rings used in the main countries of ringing (Appendix III or www.flamingoatlas.org). Sightings of Camargue rings should be reported to flamingoring@tourduvalat.org.

Observers must make sure that a ring is visible in its entirety and that not just three letters of a 4-digit code are erroneously recorded. Other pitfalls to be avoided are indicated below along with details of codes used in Camargue.

Even though it may be indicative of the origin of the birds, it is not necessary to record ring colour anymore. Both white and yellow have been used in the Camargue and after ten years most still hold

their original colour. However, some yellow rings have faded and look like the white ones which have veered to cream. Only white plastic is now in use across the Mediterranean countries with the exception of the rings used in continental Italy which are blue with white letters. As codes have all been different, irrespective of ring colour, the colour is not critical to the identification of the birds. Once the observer is certain of the ring code it can then be recorded into the dedicated application. Each entry onto the ring sheet should be accompanied by an arrow indicating the direction in which the ring was read. Some combinations read upwards, others downwards i.e. ↑↓.

Figure 1. Illustration of a ring read AUI↓ or AUI Down

A ringed flamingo should be recorded each time it is seen. If it is seen in two or more sites, the same day then it must be recorded at each of these sites if clearly separated geographically or ecologically. Sex should be recorded when possible by judging the size compared to others members of the group; a large bird (with thick legs) should be recorded as a male, a small one as a female. If a bird is clearly paired then sex must be recorded (along with status paired, see below).

Away from the breeding colony most birds will be recorded as status 00 meaning simply a healthy wild bird. This will not be the case, however, if the bird is either injured or paired, displaying etc… There are 99 possibilities for recording a bird's status; those used so far are indicated on appendix I.

THE "GREEN BIRDS" OF THE CAMARGUE

In addition to the flamingos marked as chicks at the Etang du Fangassier some full-grown birds (59) were ringed when held in captivity in January 1985. These were picked up weak during severely cold weather and afterwards released at either Pont de Gau, Palavas or Béziers. The rings used were those remaining after the 1982 chick ringing operation and they can only be told from the1982 cohort in the field by the fact that the ring is placed on the **left tibia**. These birds (mostly of unknown age and all of unknown origin) are treated just as those marked as chicks and should be entered into files in the same way. They are commonly referred to as "green birds" because that series of rings carried a green tape.

Most of the coloured tapes used from 1979 through to 1984 (placed vertically between codes in order to distinguish year of ringing when code not readable have now disappeared.

RING LOSS AND RING CONDITIONS

In order to monitor PVC ring losses a second ring has been placed on the left tibia of all chicks marked in 1986 and since then. These are stainless-steel rings 2,5 cm high and carry a code composed of four numbers preceded by the letter P (=Paris) (P0001 onwards). In the event of a flamingo being seen with such a ring **and without the PVC band** on the right tibia, then every effort must be made to read the metal ring. The bird's sex and plumage detail should also be noted. The codes on the metal rings can be read at about 70 m.

Any ring which appears to be damaged or have barnacles on it should be reported to the ringing office with details.

LEG COUNT FOR PROPORTION OF RINGED BIRDS

Leg-counts can be used to a) estimate the proportion of ring birds, b) the proportion of a flock belonging to different cohorts, and origin (Camargue versus Fuente de Piedra), and c) the proportion of breeding birds feeding in different localities/habitat types. Whenever and wherever possible groups of flamingos of any size should be checked for the numbers of birds carrying rings. **Both legs** (tibias) must be controlled and the number of **birds** (not legs) checked recorded on the special data collection sheet (p.21). The rings read must be listed thus allowing distinction to be made between the different cohorts. Metal rings must also be recorded although these may not necessarily be of French origin. Note: these Leg counts should be made regularly in foraging habitats in summer and in winter.

RECORDING RINGED FLAMINGOS RESIGHTED AT THE COLONY

Each day that a ringed flamingo is identified at the colony it must be recorded, along with other relevant data (sex, status). The status is coded according to the bird's activity and /or body condition (or both) at the time of the observation. If this changes during the day then the highest ranking in relation to breeding is automatically retained by the computer programme (appendix I) i.e. paired over-rides simple presence at the colony, an indication that a bird is breeding over-rides the fact that it is paired. Each time that an egg or chick is seen then this must be indicated by the code. When a chick is indicated, check the guide for ageing it (appendix II). Please note if the egg is clean, indicating freshly laid.

In view of this it is necessary for an observer to spend a certain amount of time watching an individual if its status is to be recorded correctly. With experience and according to the bird's activity this can vary from a few seconds (paired, displaying…) up to several hours if it is to see whether a bird yet has an egg. In this case, rather than spend such a long time continuously on the same bird it may be better to look elsewhere for other birds regularly returning momentarily with the telescope to the particular nest.

Birds seen near the colony fall into two categories, **visitors** or **breeders**.

Away from the egg or chick a breeding bird's status is 20 (when in the neighbourhood of the colony) or 00 elsewhere.

A **breeding flamingo** is a bird whose egg or chick has been seen by the observer (**confirmed breeder**) or whose behaviour (when the contents of the nest are hidden) and repeated presence at a nest allow the observer to presume that it is breeding (**accepted breeder**). An accepted breeder must first of all be reported as a **probable breeder (29)**, this assumption being based on the bird's behaviour. **It is only accepted as a confirmed breeder if it is seen more than one day later in the same place on the breeding site and again having the behaviour of a breeding bird, i.e. standing briefly, turning egg or changeover of partners (39).** When an observer first sees a flamingo (s)he believes to be breeding s(he) must therefore check to see if the bird is a known breeder (having already been accepted or confirmed). If it is not, then (s)he should check to see if it is a probable breeder. If not, then it should be recorded as such (status 29). If recorded status 29 on the previous day, then it should again be recorded 29. If recorded as 29 earlier than the previous day, then it must be accepted as a breeder (presumed breeding) and recorded status 39. Status 39 should only be given to a bird which the observer is fully convinced is breeding, this conviction only normally being brought about through the bird's regular presence over a period of days at a particular spot on the island or dike, the nest contents being hidden to the observer.

Other confirmed breeder may result from the observation of an egg (42) or when a chick is observed (43, 44 or 45). 40 is when nest contents not visible but bird is still apparently breeding. A bird can go back from 39 (and 40) to 29 if it fails his first breeding and start again breeding with another partner on another spot of the colony. Each time that a new breeder is accepted (39) or confirmed (42/43) then the nest location must be indicated on the recording application.

Ranking of status (appendix I). There are 99 possibilities for recording the status of a flamingo. Our ultimate aim is to establish whether or not a bird makes a breeding attempt, where, when etc. Since the computer programme is only designed to retain one status it has been necessary to list those we use in order of importance in relation to our aims. This order is as follows: any 40 (proof or breeding), 39, 29, 38, 30, 53, 33, 56, 36, 52, 37, 32, 55, 54, 34, 31, 51, 50, 20. In several cases these numbers refer to a combination of behaviour, activities and/or body condition. This means for example that in our opinion status 32 (paired) is a more powerful indication that a bird may be intent on breeding (or breeding) than status 31 (displaying). Indeed, it may be that none of the 30's (not the 50's) with the exception of 39 and perhaps 38 may be reliable indicators. It is sometimes important to keep two interesting pieces of information recorded the same day. For instance, « individual seen in pair (and sexed) and a few minutes later "individual incubating an egg". To keep these two different codes recorded in the same day, it is possible to keep the first observation as it is and record the second by adding an hour to the date field (e.g. "12/05/20 12:00"). The database will keep the two pieces of information.

Sex: if recorded differently for the same bird on the same day then the computer will accept this as not having been determined.

Plumage: if recorded differently for the same bird the same day then the computer will accept the most advanced rating.

RECORDING INCUBATION SHIFTS

This is an optional monitoring protocol which is interesting as it may indicate how efficiently or how far away the off-nest bird is feeding. If a large enough sample of nests can be monitored each year then they may also reflect annual differences in food availability. The sample of nests under observation is thus never large enough!

Whenever a ringed bird is found breeding on a nest which can be seen from the tower then this **must** become a nest to be followed by all observers. It may be a high mound inside the colony but is more usually situated on the edge facing the observation site. The nest will become known as that of the ringed birds. Observers will then regularly (every hour) check to see which of the partners is in attendance. Details are recorded in one's notebook and then summarised at the end of the day on the Daily sheet (or if preferred recorded directly onto the Daily sheet).

Examples:

Nest ABC partner on 06-08 hrs. ABC in. 09-21 hrs. Nest TFX n to changeover at 07:22 hrs. the partner rest of day. When a changeover of partners is seen this should be indicated with exact time.

Many changeovers take place late in the evening, perhaps also at night, and early in the morning. It is not always possible to actually witness a change of partners but by observing regularly it will be possible to locate this to within an hour or two which is quite acceptable for this study. However, if ABC incubates at nightfall but the partner is on the nest at day break then it will not be known to within 8-10 hours when the changeover took place.

By knowing the bill patterns of both partners it may be possible to determine who is incubating when the right tibia is not visible. A particular bird may not easily be located by an observer for the first time just by the bill pattern, if in doubt do not record.

NEST SITE DESCRIPTION

Every breeding attempt made by a ringed bird must be documented, including 2nd and 3rd attempts. Each time that an observer locates a new breeding bird, or new attempt, then details of the nest and positioning in colony must be described by the finder. Exceptionally, if the bird sits and is lost to view before the description can be made then this may need completing at a later date and/or by another observer. This description will allow another observer to locate the nest, or yourself to relocate it and is a permanent record of where breeding took place.

Nest position: a peripheral nest is on the edge of the occupied part of the breeding site. A marginal nest has one nest between it and the edge of the colony, an inner is several mounds inside the colony whilst a centrally-placed mound is well in towards the middle of the colony. This position may change as the colony extends or contracts and this should be mentioned as is the case following the initial description. Nest size and density are judged according to the range throughout the colony. High mounds are automatically well spaced. Nest protection from both spray and gulls is judged by the observer. The following codes will be used to describe the characteristics of the nest of a flamingo once it is confirmed to be breeding.

THE NORMAL SEQUENCE OF EVENTS DURING THE BREEDING SEASON

Pairs are already formed on arrival at the colony (few displaying flamingos are later found breeding). The pair seeks a nest site prior to laying; this may be several days or just a few hours before the egg is laid. Shortly after the egg is laid the male often tales over incubation. After this changes become less frequent and not always regular and often occur early in the morning or late in the evening but can take place at any time of the day or night. The egg is never left unattended. Individuals incubate for two to four days usually but longer periods have been recorded. After a changeover the departing bird may stand/preen in the vicinity of the nest but more usually is not seen again by the observers in the tower until it returns again to attend the nest. Shortly before hatching the attendant bird stands frequently. After hatching chicks are closely incubated for the first day or two.

Most years there are heavy egg and small chick losses due to a combination of adverse weather and predation by gulls. If a breeding bird is observed standing away from the nest (or in the vicinity) then it is quite likely to have lost its egg (or very small chick). The chicks leave the nest at about one week of age and move into a crèche on the island. At about three weeks they move into the crèche in the water and never return to the island.

Up to three breeding attempts may be made during the season, about 12 days separating loss of first (or 2nd) egg and the laying of the second (or 3rd) egg. For the whole colony laying is often spread over 6 weeks or more. The first eggs to be laid can be seen shortly after the flamingos spend their first night on the island. If these first clutches are not abandoned (because of adverse weather, disturbance or an insufficient nucleus of birds) then this is the date accepted as the beginning of laying. This is often during the first days of April (formerly mid-April). The last viable clutches to be laid are calculated back from the sightings of the youngest chicks to enter the crèche.

FLOW CHART OF OBSERVATIONS TO BE MADE FROM THE OBSERVATION SITE

Start observing at dawn, recording extension of colony (island and dyke) and record weather. Scan with telescope over island and dyke (if occupied) and check birds in water regularly. Record all rings seen with bird's status. Most time will be spent observing the birds on the island (and dyke) but those in the water should be checked every hour at least. Attempt to read metal rings if any seen near the observation site.

Midday or early afternoon: make counts of proportion of ringed birds on island and on dyke (if occupied), distinguishing between these two parts of the colony.

Early afternoon: a short siesta if needed and a good time for entering the day's observations into the computer.

Installation in the observatory

In the notebook should be written:

1. Date
2. Hour
3. Weather:
    a. Wind: direction and speed
    b. Cloudiness
    c. Temperature
    d. Time (h/s)
    e. "Exotics" flamingos presents
    f. Observations

If using the Database Siam Field (developed by Tour du Valat and available upon request):

1. Open the data base
2. The date and day are written automatically
3. Attach the name of the observer

Write the code of the ring and the reading direction. The base will save the historic observations of individuals at the site. The database will show the record of the observation of the bird in the Fangassier. Check that the ring exists and that the ring has not been read the same day. If It is the first time that the ring is read, the observation appears in yellow in the life story. It is possible to add a second observation of the individual if the status of the new observation is greater than the first one. Note the status of the bird systematically.

If the bird has a status greater than or equal to "39 new confirmed breeder", nest density and nest shape should be recorded:

- Nest coordinates, X: metallic landmarks, Y: x (near), y (middle), z (behind).
- Nest position in the colony (central / inner / periphery / border)
- Nest shape (High / Medium / Low / Flat / Depression)
- Nest Density (High / Medium / Low)
- Notes

MONITORING OF FLAMINGO POPULATION SIZE

Counts are generally exhaustive and are made from the ground, pond by pond relying on a network of partner NGO's all along the French Mediterranean coast. We generally make two total counts per year. One in winter, around the 15th of January and one in Spring around the 15th of May (set as close as possible to the peak of incubation). When impossible to access some sites (e.g., Saltpans of Salins in the Camargue in 2002-2003), fly over Cessna (high wing aircraft), 700-900 feet above sea level. In Spring additional aerial counts are generally required to precisely estimate the number of breeding pairs. Aerial counts can be done either by plane or with a drone.

Aerial count by plane:
To count the number of breeding pairs, the plane must fly over the island at a height of 1000 feet and the photograph must be taken as vertically as possible above the island. If possible, an observer on the ground estimate the number of birds which are not seated on a nest. This number will be subtracted to the total number of birds counted on the photo.
Photos count of the nursery can be taken a bit lower, i.e. starting at 900 feet and progressively descending to 750 feet while constantly checking the reaction of the crèche.

Aerial count by drone:
The use of unmanned aerial vehicles (UAVs) for aerial photography has many advantages: ease of deployment, lower cost, low disturbance of birds, image quality. It is important to ensure first of all the regulatory compliance of the flight, and to obtain the agreement of the owners and users of the site flown over. Obstacles that may compromise the flight must first be identified: trees, telephone lines, buildings... At least two people are needed to carry out the flight. The telepilot who will direct the drone and take the pictures, and his assistant who will have to make sure that no third person interferes with the pilot and who will be in charge of monitoring the evolution of the drone with binoculars, paying particular attention to the birds' reaction. Every situation is different, so you have to approach a colony at 80 m high, then descend to 50 m if the birds do not react (Fig. 2). The nervous reactions are as follows: the flamingos rise from their nest and start flapping their wings, the next step is the mass desertion of the colony. In the Camargue, the Flamingos have so far been very tolerant of the UAVs.

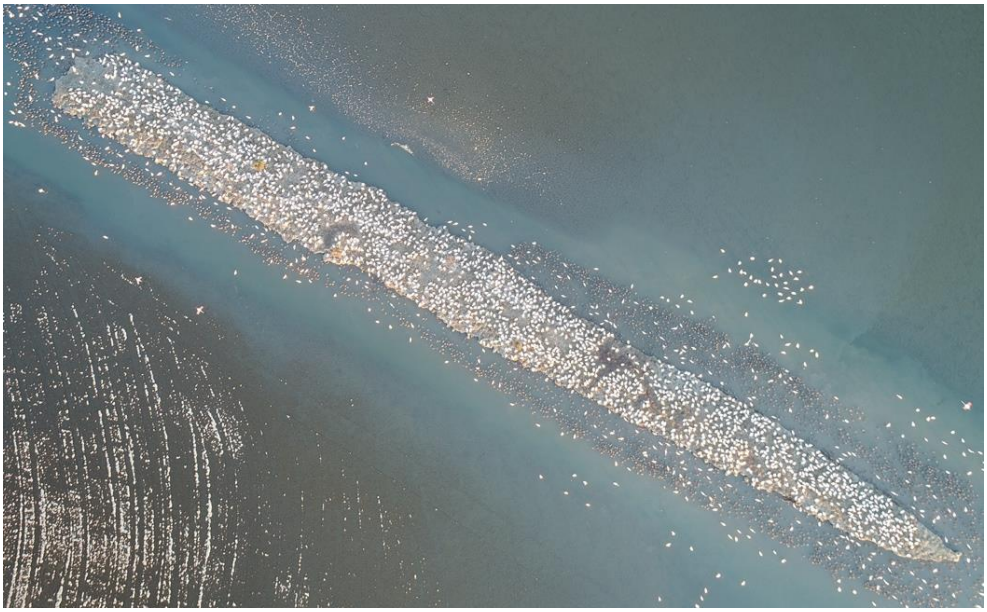

Figure 2. Picture made by an UAV at 50 m above the colony in the saltpans of Aigues-Mortes in June 2020.

Automatic count of pictures:

Tour du Valat has developed with INRIA an automatic counter for flamingo pictures. The software called FLAMINGO needs that you provide the size (in number of pixel) of the small and large axis of the ellipse represented by a flamingo. It then runs to estimate the number of birds taking into account possible overlaps of birds (Fig. 3). This free software can be downloaded for free at www.flamingoatlas.org.

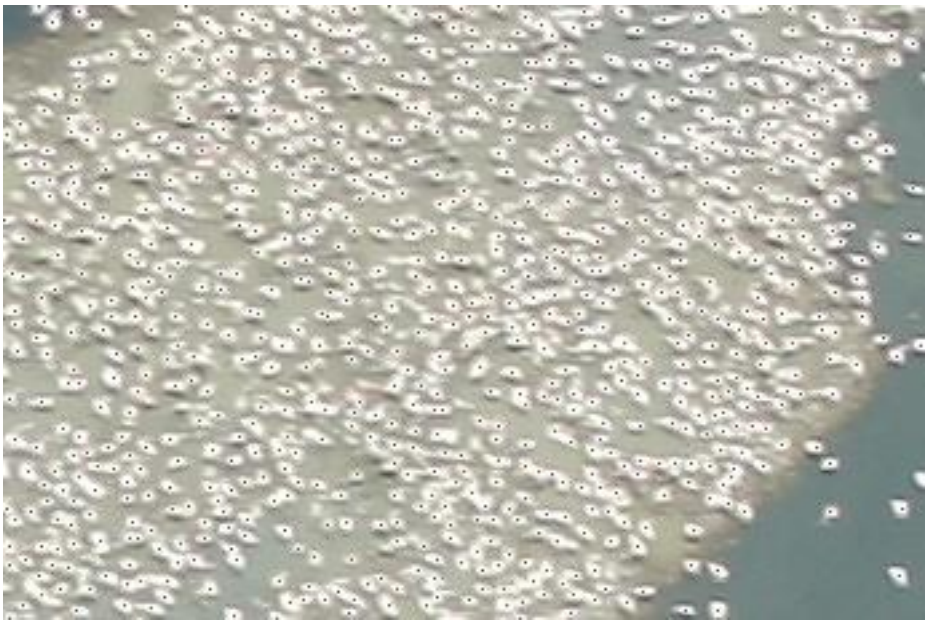

Figure 3. Example of output from the flamingo software.

APPENDIX I

Coding status of Ringed Flamingos

Code	GB	Commentaire
00	Without precision	Not necessary, out-date
01	Only ring(s) found	
02	Dead	
03	Injured or ill	
04	Injured or ill, released	
05	Injured or ill, kept in captivity	
06	Trapped and released	
07	Trapped, kept in captivity	
08	Released	A observation before should be sing in order to indicate when the bird was cachted (status 05 or 07)
720	On or near colony	
22	Single (observed alone before colony settlement)	
29	**Believed breeding (egg / chick not visible)**	**When it has been seen in the nest, without see the chick or the egg. It's very important try to know the localization more exactly of the nest (landscape, angle taken with the telescope and compass…)**
31	Display	
32	Paired	
33	Copulates	
34	Copulates with ringed bird	Write the code of the ring
35	Building a nest	
36	Dirty bird (having built a nest?)	
37	Paired with ringed bird	note the code of the partner's ring in a separate field and do not forget the opposite observation
39	**Accepted breeding (egg / chick not visible)**	**When seen on the nest without seeing either egg or chick and that the individual was seen**

		29 (probable repro) at least 48h before, at the same position on the islet
40	**Known breeders (egg / chick not visible)**	**When seen on the nest without seeing either egg or chick and the individual has been seen 39 (accepted repro) at least 24 hours before, or 42 (Couveur, egg vu) at the same position on the island**
42	Incubating, egg seen	
43	Attending chick on nest	
44	Feeds/attends chick in creche on island	
45	Feeds/attends chick in creche having left island (ring not visible)	
46	Feeds ringed chick	Note the code of the chick's ring in a separate field and it should be written the observation opposite (codes 60, 61 or 62)
47	Feeds chick not ringed	After the ringing sesion
60	Fed by ringed adult	noter le code de la bague du parent dans un champ séparé et ne pas oublier l'observation inverse (code 46)
61	Fed by unringed adult male	
62	Fed by unringed adult female	
63	Fed by unringed adult	
99	Darvic ring lost, metal ring read	

APPENDIX II

Description of different types of plumage after leaving the nest to adult

a. Down of the bill grey; legs black or grey, dark articulation. Brown-grey spotted body; dark wing
b. Bill and legs as a. Body dirty white, a bit spotted in the bac and grey neck. Dark wing
c. Bill and legs as a. Body white, neck a bit grey and dark wing
d. Grey or pinky-grey bill, grey legs with dark articulation. Body as c; pink or half-pink wing
e. Grey-pink pale bill, scaly pink-grey legs, dark articulation. Body as C. Red-pink wing
f. Pale pink neck, pale pink uniform legs or with dark articulation. Body as C with pale grey or white neck; red wing.
g. Pink bill and pink. The bird is not adult if: bill still pale, legs are pales or with dark articulation or the neck is grey
h. Bright-pink bill and legs. Pink-white body; carmine red wing
i. Vermilion ping bills and legs. All the body pink, sometimes neck and head bright-pink

Every flamingo is progressing from type A plumage to type F. Then, type I can be get after G, after H or after G and H.

The description of plumage has not explained the feathers details; it was more like a distance guide in order to be useful for knowing the age of the flamingo in the field. Before to get the adult's plumage (sometimes after) the variation of colors tonality are big even for the same age invidious. So, if a bird has not exactly the same plumage as one of the category, we will note the category more similar

APPENDIX III

Rings of flamingos in Europe

http://flamingoatlas.org/downloads/FlamingoBandsGB.pdf

Greater flamingo (*Phoenicopterus roseus*) banding schemes in the Mediterranean region from 1977 to 2018 (1/8)

Special character	Composition and range of codes			Colour	Banding site	Year	Number of bands	Example
No	2 letters			green	Lac Uromiyeh (I.R of Iran)	1999	295	
	3 numbers			white	Etg. du Fangassier (France)	1984	781	
	2 letters, 1 number	A-- to K--	AA5 to FX6, HB3 to JF3, JF6 to JH3, JJ3 to KB9, KH3 to KL6, KN4, KN5, KS3 to KS5, KX3 to KZ9	white	Etg. du Fangassier (France)	1982	650	
			FX7 to HA9, KL7 to KN3, JF5, JH5 to JH9, KC3 to KF9, KN6 to KP9, KS6 to KV7 (adults)	white	Etgs. de l'Hérault & Pont de Gau (France)	01.1985	59	
		L-- to Z--		yellow	Etg. du Fangassier (France)	1983	720	
	3 letters	A-- or B--	AAA to ARI, ARK to BZZ	yellow	Etg. du Fangassier (France)	1977	559	
			ARJ	white	Etg. du Fangassier (France)	2015	1	
		C-- or D--		white	Etg. du Fangassier (France)	1978	650	
		F-- to K--	FAA to HZX, KAA to KRZ	yellow	Etg. du Fangassier (France)	1979	651	
			JPT	white	Etg. du Fangassier (France)	2015	1	
		L-- to S--	LAA to LZZ, NAA to SZV	white	Etg. du Fangassier (France)	1980	761	
			MAX	white	Salins d'Aigues- Mortes - Etg. du Roi (France)	2018	1	
		T-- to Z--		yellow	Etg. du Fangassier (France)	1981	697	
	4 letters	A---	AA-- to AC--	yellow	Etg. du Fangassier (France)	1985	552	
			AD-- to AH--	yellow	Etg. du Fangassier (France)	1986	599	
			AJ-- to AL--	yellow	Etg. du Fangassier (France)	1987	600	
			AN-- to AS--	yellow	Etg. du Fangassier (France)	1988	600	
			AT-- to AZ--	yellow	Etg. du Fangassier (France)	1989	594	
		B--- to CB--	BA-- to BC--	yellow	Etg. du Fangassier (France)	1990	598	
			BD-- to BHAB, BHBD to BHPD, BHSA to BHSF, BHTS to BHZV	yellow	Etg. du Fangassier (France)	1991	518	
			BHAF to BHAS (2 juveniles, 1 immature, 2 adults)	yellow	Al Wathba Reserve, Abu Dhabi (UAE)	2007	5	
			BHAT, BHAV (adults)	yellow	Al Wathba Reserve, Abu Dhabi (UAE)	2009	2	
			BHAX, BHAZ (1 immature, 1 adult)	yellow	Bul Syayeef, Abu Dhabi (UAE)	2010	2	
			BHPN to BHPX, BHTH to BHTL (2 juveniles, 7 immatures)	yellow	Ras Al Khor, Dubai (UAE)	2006	9	
			BHTA to BHTF (1 juvenile, 2 immatures, 2 adults)	yellow	Al Wathba Reserve, Abu Dhabi (UAE)	2005	5	
			BHTN (2nd civil year)	yellow	Etg. de Campignol (France)	11.2004	1	
			BJ-- to BN--	yellow	Etg. du Fangassier (France)	1992	839	
			BP-- to BV--	yellow	Etg. du Fangassier (France)	1993	875	
			BX-- to CB--	yellow	Etg. du Fangassier (France)	1994	850	
		CC-- to CZ--	CC-- to CH--	yellow	Etg. du Fangassier (France)	1995	870	
			CJ-- to CP--	yellow	Etg. du Fangassier (France)	1996	800	
			CS-- to CZ--	yellow	Etg. du Fangassier (France)	1997	954	
		D--- to FF--	DA-- to DD--	yellow	Etg. du Fangassier (France)	1998	800	
			DF-- to DL--	yellow	Etg. du Fangassier (France)	1999	800	
			DN-- to DT--	yellow	Etg. du Fangassier (France)	2000	800	
			DV-- to FA--	yellow	Etg. du Fangassier (France)	2001	800	
			FB-- to FF--	yellow	Etg. du Fangassier (France)	2003	786	
		FH-- to FZ--	FH-- to FNPZ	white	Etg. du Fangassier (France)	2004	823	
			FNSA to FNXS, FNZA to FNZL, FPAA to FPXN, FSAA to FSDJ, FSFA to FPXN, FSHA to FSPN, FSSA to FTAS, FTCA to FTCZ, FTFA to FTJZ, FTNA to FTTV, FTZA to FVCF, FVFH to FVFZ	white	Etg. du Fangassier (France)	2005	643	
			FNXT to FNXZ, FNZN to FNZZ, FPXP to FPZZ, FSDL to FSDZ, FSFJ to FSFZ, FSPP to FSPZ, FSVA to FSVZ, FTAT to FTBZ, FTDA to FTDZ, FTLA to FTLZ, FTTX to FTXZ, FVCH to FVFF, FVHA to FZZZ	white	Etg. du Fangassier (France)	2006	777	

Greater flamingo (*Phoenicopterus roseus*) banding schemes in the Mediterranean region from 1977 to 2018 (2/8)

Special character			Composition and range of codes	Colour	Banding site	Year	Number of bands	Example
No	4 letters	J---	JABB, JADF to JAFZ, JALX to JAPZ, JAXP to JAZZ, JBAF, JBFJ to JBFZ, JBLS to JBPZ, JBZA to JBZZ, JCDP to JCFZ, JCXV to JCZZ, JDAF, JDDC to JDLF, JDLJ to JDLT, JDNB to JDPD, JDPJ to JDTH, JDTS toJFAH, JFBA to JFBF, JFBJ, JFBL, JFCA to JFCF	white	Etg. du Fangassier (France)	2009	367	
			JDLH, JDPF, JDTJ to JDTP, JFAJ to JFAZ, JFBH, JFBN to JFBZ, JFCH to JLPZ	white	Etg. du Fangassier (France)	2010	812	
			JLSA to JLXX, JNAA to JNVD, JNXA to JPPZ	white	Etg. du Fangassier (France)	2011	423	
			JLZA to JLZZ, JNVF to JNVZ, JPSA to JXBZ	white	Etg. du Fangassier (France)	2012	805	
			JXCA to JXXZ	white	Etg. du Fangassier (France)	2013	179	
			JXZA to JZZZ	yellow	Etg. du Fangassier (France)	2013	239	
		K---	KAAA to KBSZ	white	Etg. du Fangassier (France)	2013	388	
			KBTA to KCJX, KCNA to KCXN, KCZA to KDDA, KDHA to KDPC, KDSA to KDZD	white	Salins d'Aigues-Mortes - Etg. du Roi (France)	2014	432	
			KHAA to KHDA	white	Lagune de Korba (Tunisia)	2014	45	
			KCJZ to KCLZ, KCXP to KCXZ, KDDB to KDFZ, KDPD to KDPZ, KDZF to KFZZ, KJJA to KLAZ, KLBB to KLSV, KLTS to KNBF, KNCA to KNDZ	white	Etg. du Fangassier (France)	2015	782	
			KLBA, KLSX to KLTP, KNBH to KNBZ, KNFA to KSPT, KSSA to KSTJ, KSVA to KSVV	white	Salins d'Aigues-Mortes - Etg. du Roi (France)	2017	594	
			KSPV to KSPZ, KSTL to KSTZ, KSVX to KXTZ	white	Salins d'Aigues-Mortes - Etg. du Roi (France)	2018	673	
	3 letters	I--	IAA to IBP	blue	Laguna di Orbetello (Italy)	1994	26	
			IBV to IHZ	blue	Salines di Comacchio (Italy)	2000	66	
			IJA to IKN, ILA to INL, IPD to ITV, IVA to IXK	blue	Salines di Comacchio (Italy)	2001	116	
			IKP to IKZ, INN to IPC, ITX to ITZ, IXL to IZZ	blue	Salines di Comacchio (Italy)	2002	44	
		P--	PYK (wild adult escaped after 2 years of rehabilitation captivity)	blue	Bioparco, Rome, (Italy)	2010	1	
	4 letters	I---	IAAA to IANP, IAPA to IAVN, IAXA to IBDS	blue	Salines di Comacchio (Italy)	2002	302	
			IANS to IANZ, IAVX, IAVZ, IBDT to IBZZ, ICAA to ICAH, ICBA to ICBC, ICCA to ICCK, ICDA to ICDJ	blue	Salines di Comacchio (Italy)	2003	195	
			ICAJ to ICAZ, ICBD to ICBZ, ICCL to ICCZ, ICDK to IDNK, IDPA to IDSL, IDTA to IDTV, IDVA to IDVJ, IDZA to IDZJ	blue	Salines di Comacchio (Italy)	2004	395	
			IDNL to IDNZ, IDSN to IDSZ, IDTZ, IDVK to IDVZ, IDZK to IFTD, IFVA to IFZC, IJAA to IJAK, IJBA to IJBZ	blue	Salines di Comacchio (Italy)	2005	255	
			IFTF to IFTZ, IFZD to IHZZ, IJAL to IJAZ, IJCA to IJZZ	blue	Salines di Comacchio (Italy)	2006	448	
			IKAA to INDZ	blue	Salines di Comacchio (Italy)	2007	501	
			INFA to IPVJ	blue	Salines di Comacchio (Italy)	2008	366	
			IPVK to IPVV	blue	Valle Dogà, Venezia (Italy)	2008	7	
			IPVZ to IVDV, IVFA to IVHV	blue	Salines di Comacchio (Italy)	2009	554	
			IVDZ, IVHZ to IZZZ	blue	Salines di Comacchio (Italy)	2010	362	
		M---	MAAA to MCAZ	red	Stagno di Molentargius (Sardinia)	1997	404	
			MCBA to MCBC, MCCA to MCHT, MCL-, MCS-, MDAA to MDCT, MDL-, MDV-, MDZA to MDZD, MFC-, MFFB to MFFZ, MFLA to MFPH	red	Saline di Macchiareddu (Sardinia)	1999	200	
			MCBD to MCBZ, MCHV to MCJZ, MCP-, MCTA to MCZZ, MDCV to MDJZ, MDPA to MDTZ, MDX-, MDZF to MFBZ, MFD-, MFHB to MFJZ, MFPJ to MHAZ	red	Stagno di Molentargius (Sardinia)	2000	383	
			MHBA to MJJT	white	Saline di Macchiareddu (Sardinia)	2003	312	
			MJJV to MLPH, MVJN	white	Saline di Macchiareddu (Sardinia)	2004	499	
			MLPJ to MPLZ	white	Saline di Macchiareddu (Sardinia)	2005	426	
			MPNB to MTSZ	white	Saline di Macchiareddu (Sardinia)	2006	493	
			MTTA to MZNV	white	Saline di Macchiareddu (Sardinia)	2007	418	
			MZNZ to MZZZ	white	Saline di Macchiareddu (Sardinia)	2008	76	
		W---	WAAA to WBBZ	white	Saline di Macchiareddu (Sardinia)	2009	255	
			WBCA to WDHZ	white	Stagno di Molentargius (Sardinia)	2011	509	
			WDJA to WHJL, WHKA to WHKV	white	Saline di Macchiareddu (Sardinia)	2013	470	
			WHJN to WHJZ, WHKZ to WHNZ	white	Stagno di Molentargius (Sardinia)	2016	36	
			WHPA to WJDZ	white	Stagno di Molentargius (Sardinia)	2017	134	
			WJFA(?) to W???	*white*	*Stagno di Molentargius (Sardinia)*	*2018*	*149*	
	1 letter, 3 numbers	M---	M001 to M640	white	Saline di Macchiareddu (Sardinia)	2008	495	
			M641 to M999	white	Saline di Macchiareddu (Sardinia)	2009	246	

Greater flamingo (*Phoenicopterus roseus*) banding schemes in the Mediterranean region from 1977 to 2018 (3/8)

Special character	Composition and range of codes			Colour	Banding site	Year	Number of bands		Example
Yes, 2 dots ":" after the E	1 letter, 2 dots, 3 letters	E:---	E:AAA to E:ADZ	blue	Salines di Comacchio (Italy)	2010	60		
			E:AFA to E:BTJ	blue	Salines di Comacchio (Italy)	2011	352		
			E:BTK to E:DBZ	blue	Salines di Comacchio (Italy)	2012	293		
			E:DCA to E:DTJ, E:DVA to E:DVF	blue	Valle Paleazza, Venezia (Italy)	2013	159		
			E:DTK to E:DTZ, E:DVH to E:DZS	blue	Saline di Priolo (Sicily)	2015	29		
			E:DZT to E:FLZ	blue	Saline di Priolo (Sicily)	2017	120		
			E:FNA to E:HBJ	blue	Saline di Priolo (Sicily)	2018	104		
Yes, 1 bar "|" between the two first characters	1 letter, 1 bar, 2 numbers	A|-- to C|--	All except A|62, A|91, C|01, C|09, C|10	orange	Laguna de Fuente de Piedra (Spain)	1986	628		
			A|62	orange	Laguna de Fuente de Piedra (Spain)	1988	1		
			A|91	orange	Doñana (Spain)	2004	1		
			A|92	orange	Doñana (Spain)	2011	1		
			C|01, C|09 (adults)	orange	Laguna de Fuente de Piedra (Spain)	2010	2		
			C|10 (adult)	orange	Laguna de Fuente de Piedra (Spain)	2013	1		
			C|14 (adult)	orange	Laguna de Fuente de Piedra (Spain)	2014	1		
	1 letter, 1 bar, 2 letters	A|--	A|AA to A|AX, A|CH to A|CX, A|NR to A|NX, A|TV to C|TF	A|HV(1st civil year)	orange	Doñana (Spain)	2011	244	1	
			A|FA		orange	Salinas Cabo de Gata (Spain)	2011	1		
			A|FH, A|FJ, A|HN to A|HR, A|HX	A|FT (adult), A|HS (1st civil year)	orange	Doñana (Spain)	2006	6	2	
			A|FM (adult)		orange	Salinas de la Tapa (Spain)	2009	1		
			A|FN, A|FP (adults)		orange	Salinas de la Tapa (Spain)	2011	2		
			A|FT (adult)		orange	Laguna de Tiscar (Spain)	2006	1		
			A|FX (1st civil year)		orange	Moriles (Spain)	2009	1		
			A|HA (1st civil year)		orange	Laguna Dulce (Spain)	2011	1		
			A|HC (adult)		orange	Laguna de Fuente de Piedra (Spain)	2012	1		
			A|HT, A|HU (adults)		orange	Doñana (Spain)	2010	2		
			A|PA to A|TU	A|CA to A|CF (adults)	orange	Doñana (Spain)	2007	41	3	
	1 letter, 1 bar, 1 letter, 1 number	A|-- to Z|--	A|A0 to A|A4, A|A6, A|A9 to A|B9, A|C1 to A|C4, A|C6, A|C9, A|F0, A|F6, A|H0 to A|H6, A|H9, A|K0 to A|N4, A|N6, A|N9 to A|P4, A|P6, A|S0 to A|T4, A|T6, A|T9, A|V0 to A|V4, A|V6, A|V9, A|X0 to A|X4, A|X6, A|X9 to B|B0, B|B2, B|C2 to B|C6, B|F0 to B|V6, B|X2 to B|Z2, B|Z6 to C|A4, C|A6, C|A9 to C|C4, C|C6, C|C9 to C|F4, C|F6, C|F9 to C|H4, C|H6, C|H9, C|K0, C|L0 to C|L4, C|L6, C|L9, C|N0 to C|N4, C|N6, C|P6, C|P9, C|S0 to C|T4,C|T6, C|T9 to H|L4, H|L6 to H|N6, H|P1 to K|K2, K|K4 to K|Z9, L|A1 to L|H1, L|N0 to L|S1, N|A0 to N|P4, P|A0 to P|F4, T|A1 to T|K1		orange	Laguna de Fuente de Piedra (Spain)	1987	701		
			A|A5, A|A7, A|U6 to A|U9, A|V5, A|V7, A|W1 to A|W7, A|X5, A|X7, C|A5, C|A7, C|A8, C|C5, C|C7, C|C8, C|F5, C|F7, C|F8, C|H5, C|H7, C|H8, C|J0 to C|J9, C|L5, C|L7, C|L8, C|M0 to C|M9, C|N5, C|N7, C|N8, C|P5, C|P7, C|P8, C|R0 to C|R9, C|T5, C|T7, C|T8		orange	Doñana (Spain)	2011	70		
			A|H7 (1st civil year)		orange	Laguna Dulce (Spain)	2011	1		
			A|C0, A|F1 to A|F4, A|F9, B|B1, B|B3 to B|C1, B|C9, B|V9 to B|X1, B|Z3, B|Z4, C|H6, C|H9, C|K1 to C|K9, C|N9 to C|P4, H|P0, K|K3, L|A0, L|H2 to L|L6, L|S2 to L|Z9, N|S0 to N|Z9, P|F6 to P|N9, P|S0 to T|A0, T|K2 to Z|Z9		orange	Laguna de Fuente de Piedra (Spain)	1988	637		
			A|J0 to A|J7 (adults)		orange	Laguna de Fuente de Piedra (Spain)	2000	8		
			A|N5, A|N7 (adults)		orange	Doñana (Spain)	2000	2		
			A|U0, A|U2, A|U3 (adults)		orange	Laguna de Fuente de Piedra (Spain)	2004	3		
			A|U5 (adult)		orange	Doñana (Spain)	2004	1		
			A|U1 (adult)		orange	Doñana (Spain)	2005	1		
			A|F8		orange	Salinas Cabo de Gata (Spain)	2006	1		
			A|J8		orange	Doñana (Spain)	2006	1		
			A|P5, A|P7, A|P8, A|R0 to A|R9, A|T5, A|T7, A|T8	A|C5, A|C7, A|C8 (adults)	orange	Doñana (Spain)	2007	16	3	
			H|L5 (adult)		orange	Laguna de Fuente de Piedra (Spain)	1998	1		
			P|P0 to P|P9		orange	Laguna de Fuente de Piedra (Spain)	1990	6		
	1 letter, 1 bar, 1 number, 1 letter	A|-- to C|--	A|0A to A|9H, A|9K, A|9L, A|9N, A|9P, A|9S, A|9T, A|9X to C|0H, C|0K, C|0L, C|0N, C|0P, C|0S, C|0T, C|0V, C|0X to C|2H, C|2K to C|2P, C|2S to C|3H, C|3K to C|4Z, C|6A to C|6H, C|6K, C|6L, C|6N, C|6P, C|6S, C|6T, C|6V to C|6Z, C|9A to C|9L, C|9N to C|9T, C|9V, C|9X to F|4Z		orange	Laguna de Fuente de Piedra (Spain)	1988	362		
			A|9J, A|9M, A|9R, A|9U, C|9M		orange	Doñana (Spain)	2011	5		
			C|0J, C|0M, C|0R, C|0U, C|0W (adults)		orange	Laguna de Fuente de Piedra (Spain)	2010	5		
			C|1J (adult)		orange	Laguna de Fuente de Piedra (Spain)	2014	1		
			C|1M, C|1R (adults)		orange	P.N. Marismas del Odiel (Spain)	2014	2		

Greater flamingo (*Phoenicopterus roseus*) banding schemes in the Mediterranean region from 1977 to 2018 (4/8)

Special character	Composition and range of codes			Colour	Banding site	Year	Number of bands		Example
Yes, 1 bar "|" between the two first characters	1 letter, 1 bar, 1 number, 1 letter	C|-- to H|--	C|1U (adult)	orange	P.N. Marismas del Odiel (Spain)	2015	1		
			C|1W, C|6M, C|6R, C|6U (adults)	orange	Laguna de Fuente de Piedra (Spain)	2015	4		
			C|6W, C|7A, C|7W (adults)	orange	P.N. Marismas del Odiel (Spain)	2016	3		
			C|7F, C|7H (adults)	orange	Laguna de Fuente de Piedra (Spain)	2017	2		
			C|2J, C|2R (adults)	orange	Doñana (Spain)	2012	2		
			C|3J (adult)	orange	Laguna de Fuente de Piedra (Spain)	2011	1		
			C|5A to C|5J (adults)	orange	Doñana (Spain)	2010	5		
			C|6J	orange	Veta la Palma (Spain)	2013	1		
			C|7N (adult)	orange	Laguna de Fuente de Piedra (Spain)	2018	1		
			C|8A to C|8X (adults)	orange	Laguna de Fuente de Piedra (Spain)	2013	15		
			C|9U, C|9W (adults)	orange	P.N. Marismas del Odiel (Spain)	2013	2		
			F|6A to H|1Z	orange	Laguna de Fuente de Piedra (Spain)	1990	54		
	1 number, 1 bar, 2 characters (number and/or letter)	0|--	0|00 to 0|7C, 0|80 to 0|MF, 0|N0 to 0|XW	orange	Laguna de Fuente de Piedra (Spain)	1990	547		
			0|7F to 0|7M, 0|7P to 0|7X	orange	Doñana (Spain)	1991	11		
			0|7N, 0|MH, 0|MJ (adults)	orange	Doñana (Spain)	1999	3		
			0|ML to 0|MX	orange	Doñana (Spain)	2011	10		
		1|--	1|00 to 1|03 (1st civil year)	orange	Doñana (Spain)	1988	4		
			1|04 to 1|06 (1st civil year)	orange	Chiclana de la Frontera (Spain)	1988	3		
			1|07 to 1|11 (adults)	orange	Doñana (Spain)	1997	20		
			1|13 to 1|1N (adults)	orange	Doñana (Spain)	1998	15		
			1|1R to 1|1X, 1|A0 to 1|FX (adults)	orange	Doñana (Spain)	2001	81		
			1|20 to 1|32, 1|34 to 1|4U, 1|4W to 1|5F, 1|5J to 1|5U, 1|5W to 1|6C, 1|6H to 1|6T,1|6V to 1|6X, 1|71 to 1|7U 1|33, 1|5H, 1|5V, 1|6F, 1|70 (adults)	orange	P.N. Marismas del Odiel (Spain)	1998	139	5	
			1|4V, 1|6U, 1|7V, 1|7W (1st civil year)	orange	Doñana (Spain)	1999	4		
			1|80 to 1|87 (1st civil year)	orange	Laguna Dulce (Spain)	2001	7		
			1|88 to 1|8M (adults)	orange	Doñana (Spain)	2010	8		
			1|90 to 1|94, 1|1P (adults)	orange	Doñana (Spain)	2002	6		
			1|95 to 1|97, 1|H0 (adults)	orange	Doñana (Spain)	2003	4		
			1|99 to 1|9T, 1|9W, 1|L0 to 1|RX, 1|T7 to 1|XX	orange	P.N. Marismas del Odiel (Spain)	2004	253		
			1|9U, 1|9V; 1|9X, 1|H1 to 1|H6, 1|J0 to 1|JX (adults)	orange	Doñana (Spain)	2006	34		
			1|HU to 1|HX 1|8N to 1|8X, 1|H8 to 1|HT (adults)	orange	Doñana (Spain)	2011	4	21	
			1|T0 to 1|T6 (adults)	orange	Laguna de Fuente de Piedra (Spain)	2004	7		
		2|--	2|00 to 2|3M, 2|40 to 2|JP	orange	Laguna de Fuente de Piedra (Spain)	1990	361		
			2|3N to 2|3X, 2|JR	orange	Doñana (Spain)	1991	9		
			2|JT to 2|XX	orange	Laguna de Fuente de Piedra (Spain)	1991	255		
		3|--	3|00 to 3|PT	orange	Laguna de Fuente de Piedra (Spain)	1991	465		
			3|PU to 3|UF	orange	Doñana (Spain)	1991	67		
			3|UM (adult)	orange	Doñana (Spain)	1998	1		
			3|V0, 3|V2	orange	Doñana (Spain)	1994	2		
			3|V3, 3|V4 (adults)	orange	Doñana (Spain)	1997	2		
			3|UN to 3|UW, 3|V5 to 3|VH (adults)	orange	Doñana (Spain)	2000	13		
			3|VV to 3|WW	orange	Doñana (Spain)	2004	28		
			3|X0 to 3|XX	orange	Doñana (Spain)	2003	23		
		4|--	4|00 to 4|3P, 4|40 to 4|74, 4|8L to 4|CF, 4|F0 to 4|HJ, 4|L0 to 4|RC, 4|T0 to 4W3	orange	Laguna de Fuente de Piedra (Spain)	1994	474		
			4|3R to 4|3X, 4|75 to 4|7X, 4|CH to 4|CX, 4|HP to 4|HX, 4|RF to 4|RX, 4|W4 to 4|XW	orange	Doñana (Spain)	2004	101		
			4|J3, 4|J5 (adults)	orange	Laguna de Fuente de Piedra (Spain)	2004	2		
			4|J6, 4|J7 (adults)	orange	Laguna de Fuente de Piedra (Spain)	2003	2		
			4|J8, 4|J9 (1st civil year)	orange	Doñana (Spain)	2002	2		
			4|JA to 4|JR (adults)	orange	Laguna de Fuente de Piedra (Spain)	2001	9		
			4|JT to 4|JX (adults)	orange	Laguna de Fuente de Piedra (Spain)	2002	5		
		5|-- to 7|--	5|05 to 5|FC, 5|FL to 7|HL, 7|M0 to 7|MR	orange	Laguna de Fuente de Piedra (Spain)	1996	1300		
			5|FF to 5|FJ	orange	Doñana (Spain)	2004	3		
			7|HM to 7|LX, 7|MT to 7|XX	orange	Doñana (Spain)	2003	221		

Greater flamingo (*Phoenicopterus roseus*) banding schemes in the Mediterranean region from 1977 to 2018 (5/8)

Special character	Composition and range of codes				Colour	Banding site	Year	Number of bands		Example
Yes, 1 bar "|" between the two first characters	1 number, 1 bar, 2 characters	8|--	8|F5 to 8|JX, 8|R0 to 8|RX, 8|U0 to 8|UX, 8|X5 to 8|XX (adults)		orange	Laguna de Fuente de Piedra (Spain)	1998	125		
			8|0J to 8|7L, 8|7N to 8|CX, 8|L5 to 8|PX, 8|T5 to 8|TX, 8|V5 to 8|WW	8|7M (adult)	orange	Doñana (Spain)	2003	255	1	
	1 letter, 1 bar, 2 characters (number and/or letter)	J|-- to T|--	J|00 to J|LN		white	P.N. Marismas del Odiel (Spain)	2008	390		
			J|LP to J|XV, L|01 to L|5W		white	P.N. Marismas del Odiel (Spain)	2009	340		
			L|5X to M|6U		white	P.N. Marismas del Odiel (Spain)	2010	548		
			M|6W to N|4V		white	P.N. Marismas del Odiel (Spain)	2011	476		
			N|4W to P|9V		white	P.N. Marismas del Odiel (Spain)	2013	520		
			P|9W to P|LX, P|N5 to R|8N		white	P.N. Marismas del Odiel (Spain)	2014	500		
			P|M0 (*Phoenicopterus minor*)		white	Laguna de Fuente de Piedra (Spain)	2014	1		
			R|8P to R|XX		white	P.N. Marismas del Odiel (Spain)	2015	406		
			T|00 to T|MX		white	P.N. Marismas del Odiel (Spain)	2016	424		
			T|P5 to T|XX		white	P.N. Marismas del Odiel (Spain)	2017	145		
	1 number, 1 bar, 3 letters	0|--- to 2|---	0|A-- to 0|D--		white	Laguna de Fuente de Piedra (Spain)	1997	1142		
			0|F-- to 0|JCF, 0|JJF to 0|NBJ		white	Laguna de Fuente de Piedra (Spain)	1998	1339		
			0|JCH to 0|JJD, 0|NBL to 0|R--		white	Laguna de Fuente de Piedra (Spain)	1999	868		
			0|S-- to 0|V--		white	Laguna de Fuente de Piedra (Spain)	2000	863		
			0|X-- to 1|BJ-		white	Laguna de Fuente de Piedra (Spain)	2001	1000		
			1|BL- to 1|FHH		white	Laguna de Fuente de Piedra (Spain)	2002	800		
			1|FHI to 1|IJN		white	Laguna de Fuente de Piedra (Spain)	2003	611		
			1|IJP to 1|LLV		white	Laguna de Fuente de Piedra (Spain)	2004	600		
			1|LLX to 1|PPX		white	Laguna de Fuente de Piedra (Spain)	2006	611		
			1|PPZ to 1|STF		white	Laguna de Fuente de Piedra (Spain)	2007	616		
			1|STH to 1|VVS		white	Laguna de Fuente de Piedra (Spain)	2009	600		
			1|VXB to 2|AAB		white	Laguna de Fuente de Piedra (Spain)	2010	613		
			2|AAC to 2|CBJ		white	Laguna de Fuente de Piedra (Spain)	2011	600		
			2|CBN to 2|DZF		white	Laguna de Fuente de Piedra (Spain)	2013	539		
			2|DZH to 2|IBD		white	Laguna de Fuente de Piedra (Spain)	2014	610		
			2|IBF to 2|JJR, 2|JJT to 2|LCZ	2|JJS, 2|LNA, 2|LNB (1st civil year)	white	Laguna de Fuente de Piedra (Spain)	2015	604	3	
			2|LDA to 2|LLZ, 2|LNC to 2|PNT		white	Laguna de Fuente de Piedra (Spain)	2017	603		
			2|PNV to 2|SXL		white	Laguna de Fuente de Piedra (Spain)	2018	598		
		9|---	9|AAA to 9|ALL		white	P.N. Marismas del Odiel (Spain)	2017	120		
			9|ALN to 9|BZJ		white	P.N. Marismas del Odiel (Spain)	2018	381		
	1 letter, 1 bar, 3 letters	T|---	T|AAA to T|AVF		white	Çamalti Tuzlası, Gediz Deltası (Turkey)	2003	200		
			T|AZA to T|CAK		white	Çamalti Tuzlası, Gediz Deltası (Turkey)	2004	247		
			T|CBA to T|CBZ, T|CDA, T|CFA to T|CSZ, T|CVH, T|CZA to T|DBZ, T|DDA to T|DLZ		white	Çamalti Tuzlası, Gediz Deltası (Turkey)	2005	270		
			T|CAL to T|CAZ, T|CCA to T|CCZ, T|CDB to T|CDZ, T|CTA to T|CVF, T|CVJ to T|CVZ, T|DCA to T|DCZ, T|DNA to T|FCZ, T|FDH, T|FDJ		white	Çamalti Tuzlası, Gediz Deltası (Turkey)	2007	216		
			T|FDA to T|FDF, T|FDK to T|HZZ		white	Çamalti Tuzlası, Gediz Deltası (Turkey)	2009	247		
	1 letter, 1 bar, 3 numbers or 3 letters	X|---	X|000 to X|399	X|419, X|420 (adults)	white	Punta de la Banya, Delta de l'Ebre (Spain)	2004	399	2	
			X|402 to X|404 (adults)		white	Punta de la Banya, Delta de l'Ebre (Spain)	2013	3		
			X|405 (adult)		white	Punta de la Banya, Delta de l'Ebre (Spain)	2014	1		
			X|406 (2nd civil year)		white	Punta de la Banya, Delta de l'Ebre (Spain)	2015	1		
			X|407 to X|410 (2nd civil year)		white	Punta de la Banya, Delta de l'Ebre (Spain)	2016	4		
			X|421 to X|820	X|418 (adult)	white	Punta de la Banya, Delta de l'Ebre (Spain)	2006	400	1	
			X|821 to X|BCA	X|416, X|417 (1st civil year and adult)	white	Punta de la Banya, Delta de l'Ebre (Spain)	2007	400	2	
			X|BCB to X|CLL, X|CPJ to X|CZC	X|414, X|415 (adults)	white	Punta de la Banya, Delta de l'Ebre (Spain)	2008	350	2	
			X|CLN to X|CPH, X|CZD to X|FPS	X|413 (1st civil year)	white	Punta de la Banya, Delta de l'Ebre (Spain)	2009	400	1	
			X|FPT to X|JJH	X|412 (adult)	white	Punta de la Banya, Delta de l'Ebre (Spain)	2010	400	1	
			X|JJJ to X|JTH, X|JTT to X|LBT, X|LCB to X|LTX, X|LVT to X|NBB	X|400 (1st civil year) X|411, X|NDB, X|NDC, X|NDD (adults)	white	Punta de la Banya, Delta de l'Ebre (Spain)	2011	350	5	

Greater flamingo (*Phoenicopterus roseus*) banding schemes in the Mediterranean region from 1977 to 2018 (6/8)

Special character	Composition and range of codes				Colour	Banding site	Year	Number of bands		Example
Yes, 1 bar "|" between the two first characters	1 letter, 1 bar, 3 numbers or 3 letters	X|---	X|JTJ to X|JTS, X|LBV to X|LCA, X|LTZ to X|LVS, X|NBC to X|NDA, X|NDF to X|PTN	X[401 (1st civil year) X|PTP to X|PVC (adults)	white	Punta de la Banya, Delta de l'Ebre (Spain)	2012	400	10	
			X|PXA to X|PXZ, X|SFH to X|SHC, X|SPS to X|SSP, X|TAS to X|TBT, X|TJA to X|TJX	X|PVD (2nd civil year) X|TTH, X|TTJ (adults)	white	Punta de la Banya, Delta de l'Ebre (Spain)	2016	71	3	
			X|PZA to X|SFF, X|SHD to X|SPP, X|SST to X|TAP, X|TBV to X|THZ, X|TJZ to X|TTF, X|TTL to X|VBC	X|PVH, X|VBD, X|VBF (adults) X|PVF, X|PVJ (1st civil year)	white	Punta de la Banya, Delta de l'Ebre (Spain)	2017	400	5	
			X|VBH to X|XVZ	X|XXA to X|XXD (adults)	white	Punta de la Banya, Delta de l'Ebre (Spain)	2018	400	4	
Yes, 1 bar "|" in the middle	1 letter, 1number, 1 bar, 1 number, 1 letter	A-|-- B-|--	A0|0A to A1|3Z		yellow	Garaa Ezzemoul (Algeria)	2006	208		
			A1|4A to A1|4L		yellow	Lac El Goléa (Algeria)	2009	8		
			A1|4N to A1|5Z, A1|7A to A5|9Z		yellow	Garaa Ezzemoul (Algeria)	2009	636		
			A6|6S to A6|7Z, A6|9A, A7|1A to A7|1Z, A7|4A, A7|4B, A8|1A to A8|2Z		yellow	Sebkhet Safioune (Algeria)	2011	62		
			A1|6A to A1|6Z, A6|0A to A6|6P, A6|8A to A6|8Z, A6|9B to A7|0Z, A7|2A to A7|3Z, A7|4C, A7|4X to A8|0Z, A8|3A to B3|0Z		yellow	Garaa Ezzemoul (Algeria)	2011	895		

Ringed outside the Mediterranean region and not only Greater flamingos, but birds potentially observable in the region

Special character	Composition and range of codes						Colour	Banding site	Year	Number of bands			Example
			Phoenicopterus roseus	*Ph. roseus* x *Ph. chilensis*	*Ph. roseus* x *Ph. ruber*	*Phoenicopterus chilensis*							
No	2 letters, 2 numbers	ZV--	ZV06			ZV01 to ZV05, ZV07, ZV08	red	Venn Nature Reserve (Germany)	1995	1			7
			ZV12		ZV17	ZV09 to ZV11, ZV13	red	ture Reserve (Germany)	2001	1		1	4
			ZV15		ZV18	ZV16, ZV19, ZV20	red	ture Reserve (Germany)	2003	1		1	3
			ZV22 (2nd year)				red	Anjum (Netherlands)	2001	1			
						ZV23, ZV24	red	ture Reserve (Germany)	2002				2
					ZV25	ZV21, ZV26, ZV27	red	ture Reserve (Germany)	2004			1	3
			ZV33	(ZV28)	ZV34	(ZV28), ZV29 to ZV32, ZV35, ZV36	red	ture Reserve (Germany)	2005	1	(1)	1	6 (7)
			ZV42			ZV38 to ZV41	red	ture Reserve (Germany)	2006	1			4
			ZV48	(ZV46), ZV47		ZV43 to ZV45, (ZV46)	red	ture Reserve (Germany)	2007	1	1 (2)		3 (4)
			ZV51	ZV52	ZV54	ZV49, ZV50, ZV53	red	ture Reserve (Germany)	2011	1	1	1	3
						ZV55 to ZV57	red	ture Reserve (Germany)	2012				3
				(ZV61), (ZV63)	(ZV61), (ZV63)	ZV58, ZV59, ZV60, ZV62	red	ture Reserve (Germany)	2013		1 (2)	1 (2)	4

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Elements to be communicated for a band reading

Date

Site (be as precised as you can, if you transmit GPS co-ordinates, do not forget to also transmit the reference of the used co-ordinates system)

Position of the read band (right or left tibia)

Code of the read band (**do not forget to note the possible presence of the bar or the 2 dots**)

Reading direction of the read band (from bottom to top or from top to bottom)

Colour of the ring

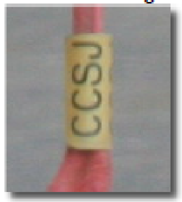
Age of the bird: juvenile / immature / adult

First and last names of the observers (2 maximum)

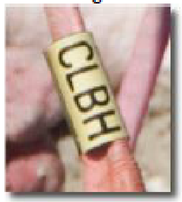
Other possible elements, as the sex, flock size, the breeding status...

Note: Always try to transmit the maximum of information, for example if a bird is found dead, to note the decomposition state, the possible cause of the death, etc...

Reading directions of PVC rings

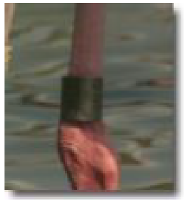


CCSJ Up

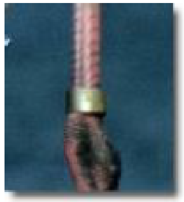


CLBH Down

Metal Rings



Large



Narrow

Greater flamingo (*Phoenicopterus roseus*) banding schemes in the Mediterranean region from 1977 to 2018 (8/8)

Used characters in ring codes according to the kind of bands

Used characters legend: ? all positions; ? never in first postion; ? only in first position

Kind of band	Banding country	Colour	Number of characters	Usual* reading direction	Usual* location	Stripe	Metal Ring	Used characters
???	France	Light (white/yellow)	3	↑ or ↓	Right	No	No	0 1 2 3 4 5 6 7 8 9 A B C D F G H I J K L N P R S T U V X Y Z
????	France	Yellow	4	↑ or ↓	Right	No	Large	A B C D F H J K L N P S T V X Z
????	France	White	4	↑ or ↓	Right	No	Large	A B C D F H J K L N P S T V X Z
M???	Italy - Sardinia	Red	4	↑	Right	No	Narrow	A B C D F H J L M P S T V X Z
M???	Italy - Sardinia	White	4	↑ or ↓	Left	No	Narrow	0 1 2 3 4 5 6 7 8 9 A B C D F H J K L M N P S T V Z
W???	Italy - Sardinia	White	4	↓	Left	No	Narrow	A B C D F H J K L N P S T V W Z
I??	Italy	Blue	3	↑	Left or Right	No	Narrow	A B C D F H I J K L N P S T V X Z
I???	Italy	Blue	4	↑ or ↓	Right	No	Narrow	A B C D F H I J K L N P S T V X Z
E:???	Italy (Continental & Sicily)	Blue	4	↑ or ↓	Left or Right	No	Narrow	A B C D E F H J K L N P S T V Z
?|??	Spain - Andalousia	Orange	3	↑	Left	Yes	Narrow	0 1 2 3 4 5 6 7 8 9 A B C F H J K L M N P R S T U V W X Z
?|??	Spain - Andalousia	White	3	↓	Left	Yes	Narrow	0 1 2 3 4 5 6 7 8 9 A C F H J L M N P R T U V W X
?|???	Spain - Andalousia	White	4	↓	Left	Yes	Narrow	0 1 2 9 A B C D F H I J K L N P R S T V X Z
T|???	Turkey	White	4	↑ or ↓	Right	Yes	Large	A B C D F H J K L N P S T V Z
X|???	Spain - Catalonia	White	4	↓	Right	Yes	Narrow	0 1 2 3 4 5 6 7 8 9 A B C D F H J L N P S T V X Z
??|??	Algeria	Yellow	4	↑ or ↓	Right	Yes	No	0 1 2 3 4 5 6 7 8 9 A B C D F H J L N P S T V X Z
Z???	Germany Netherlands	Red	4	↑ or ↓	Left or Right	No	Narrow	0 1 2 3 4 5 6 7 8 9 V Z

* The term "usual" is used to acknowledge the exceptions caused by misapplications