# COMMON CRANE (*Grus grus*) MIGRATION IN SPAIN

## José Antonio Román Álvarez (Grus Extremadura)

Cranes use two routes to reach Spain. The principal one brings the bulk of wintering cranes from the north-west of Europe. The majority of these birds come from Scandinavia, the Baltic States and central Europe, which are channelled through northern Germany and continue to north-eastern France, where they generally take a break at the Lac du Der (a reservoir) in Chantecoq; they begin arriving at the end of August in small flocks or in big waves. From here they leave continuously, if the weather conditions allow them to. If the conditions don´t allow them to leave, the population increases considerably as new migrants arrive, and when conditions are suitable they leave *en masse*. This phenomenon was seen in autumn 2019 when up to 200,000 cranes were held up in this area in late October and early November then left continuously over two days.

Their journey takes them across France, southwest to Landes in Nouvelle Aquitaine, where again they will take a break before crossing the Pyrenees (although they may cross them immediately if meteorological conditions are favourable). They generally cross the Pyrenees through the valleys of Navarra and western Aragon to make for Gallocanta Lagoon, an obligatory stop for the majority. The stay at this lagoon usually lasts a few days, but if it has dried out, as occasionally happens, cranes just spend the night here and continue their journey the next day. They also choose reservoirs or lagoons a few kilometres from this lagoon. A minority continues the journey across La Rioja without going to this lagoon, going by Tierra de Campos to El Oso lagoon on the old traditional route. This ancient route was first described by Valverde (1952) when he described the migration they were making across Castilla, this being the regular route that they used to get to the south-west Iberian wintering areas until the 1980s, to arrive in Salamanca, Extremadura, Andalucía and Portugal.

The desiccation of the majority of wetlands on this route (La Nava and others) required a change of strategy and they began to migrate through the centre of the country, diverting to Gallocanta and then continuing to some new reservoirs, such as Buendía. After crossing the centre of the country they spread out across La Mancha and some groups head south as far as Fuente de Piedra, Malaga. They occupy the border areas of Toledo, continuing to Avila, Salamanca, Valladolid and Zamora.

The bulk will continue to Extremadura, many entering through the Tajo Valley (via Valdecañas in the north-east of Caceres) to spread out across this province. Others (the majority) enter by the Cijara valley to Orellana reservoir, entering the Central Zone of Extremadura where they rest and feed, using this area as a corridor which takes them to all parts of the region, Portugal, northern Cordoba, Seville´s surrounding

countryside, Doñana and La Janda, from where some may cross the Straits of Gibraltar to winter in Morocco.

A second route which cranes use to reach the peninsula is the Baltic-Hungary route, used by some of the birds from Finland, Estonia, Latvia, Lithuania and probably from eastern Poland to migrate to Hortobagy (Hungary), then to Serbia, continuing by Croatia and Slovenia to migrate across northern Italy, flying to the south of the Alps, resting in the Po Valley, which some birds have established as a wintering area in recent years. They continue west to The Camargue (southern France) to rest and where many will spend the winter (it has also become a wintering area). Others head via Austria to the Jura Massif, France, and subsequently divert to The Camargue (Salvi, 2016). From this area they head for the Pyrenees, crossing through Catalonia or Andorra and then making for Gallocanta, while a minority will continue down the eastern side of the Iberian Peninsula to northern Africa. The Balearic Isles could be a reference point for the birds that cross the Mediterranean for north to south.

This route used to take cranes through the Italian Peninsula to The Maghreb, but at the beginning of the 21st Century it was noticed that they were beginning to divert to the Iberian Peninsula, although it should not be ruled out that they've been using this route for longer, as previously there were far fewer observers, as we have evidence of migratory movements through Catalonia since the first Grus project (Fernández Cruz 1978).

In general, the autumn migration is more leisurely and may last more than two months (from October to December), until the breeding areas are abandoned (which they begin to do in late August); migration can even be extended, occasionally, into January, as increasingly mild winters in central Europe allow many cranes to stay in or close to their breeding areas well into the season and they don´t leave until an adverse cold front moves them WSW, even as far as crossing the Pyrenees, depending on the depth of the front.

Spring migration, however, happens much more quickly, as the adults are in a hurry to reach the breeding areas, so it usually runs for just a month, from the end of February to early April, the bulk of migration starting during the last week of February. They abandon the wintering areas in mid-morning when thermal air currents form and they migrate decisively, with brief stops. Cranes from the most westerly parts of Extremadura usually take a break at Valdecañas reservoir (Caceres), while those from the Central Zone do so at Buendía reservoir (Guadalajara/Cuenca). The next stage takes them to Gallocanta lagoon (Teruel/Zaragoza), from where the majority of adults will set off the next day and, depending on the wind, they will cross the Pyrenees from Navarra or will take a break at Sotonera reservoir (Huesca). If they cross, they will continue to central France to take another break in the centre of the country before reaching Der (Chantecoq). Once here, and after a rest (which may last a few

days),they will make for Belgium, Luxembourg and The Netherlands, heading for northern or central Germany, where they may stay a few days or weeks before returning to their neighbouring countriesof origin, while Baltic and Scandinavian birds will not arrive until the end of March or early April.

At Sotonera (Huesca), if wind conditions are favourable, they cross the mountains from the valleys of Huesca or even Navarra, although sometimes the wind pushes them further east and they go through Catalunya´s valleys, especially those in Lleida, although many also use those of Gerona. Many of them may also come from Gallocanta, pushed by the north-west wind. They will then continue towards The Camargue and from there pick up the route north (to Der), some diverting eastwards by the Jura towards Austria or even following the route south of the Alps across the north of Italy to go to Hortobagy. Thanks to GPS we know that Lithuanian adults go south via Hungary but return by north-eastern France, although the juveniles usually return by their original route through northern Italy (Figure no.1). Many of them even spend their first summer at Hortobagy (Ojastepers.com).

While the adults and sub-adults migrate determinedly and actively, the young one travel more slowly and may stay in the Peninsula for several weeks before leaving. At the end of February, families begin to split up and the juveniles form flocks with non-breeding adults and other immature cranes and travel with these flocks, which may stay until well into March before crossing the Pyrenees, but finally they will leave for their countries of origin (generally).

Figure nº 1: Autumn migration by Lithuanian cranes in red. In yellow, the adults´ spring route and in blue that of the juvenile (map courtesy of ArkadiuszBroniarek).The pair left on migration from the west of Extremadura and five days later they were at Lac du Der (north-eastern France), leaving the young bird in Extremaduran dehesas, where it stayed two weeks before setting off.

In the spring of 2020, an Estonian family that had wintered in Algeria, where they arrived via the Italian Peninsula, instead of returning by the way they came, crossed to the Iberian Peninsula and headed for the Los Pedroches valley in the north of Cordoba province, where they probably split up. The juvenile stayed almost two weeks in those dehesas before returning by Gallocanta, the east of France, crossing Switzerland and diverting to Austria to reach Hortobagy (Hungary), where it stayed a few weeks then returned to its country, although it came back for a short time then went back to Estonia. This crane is called “Vilja” (figs. 2 & 3).


Figure nº 2: Autumn and spring routes taken by Vilja´s family, showing the looping route to the Iberian Peninsula (Info: IvarOjaste).

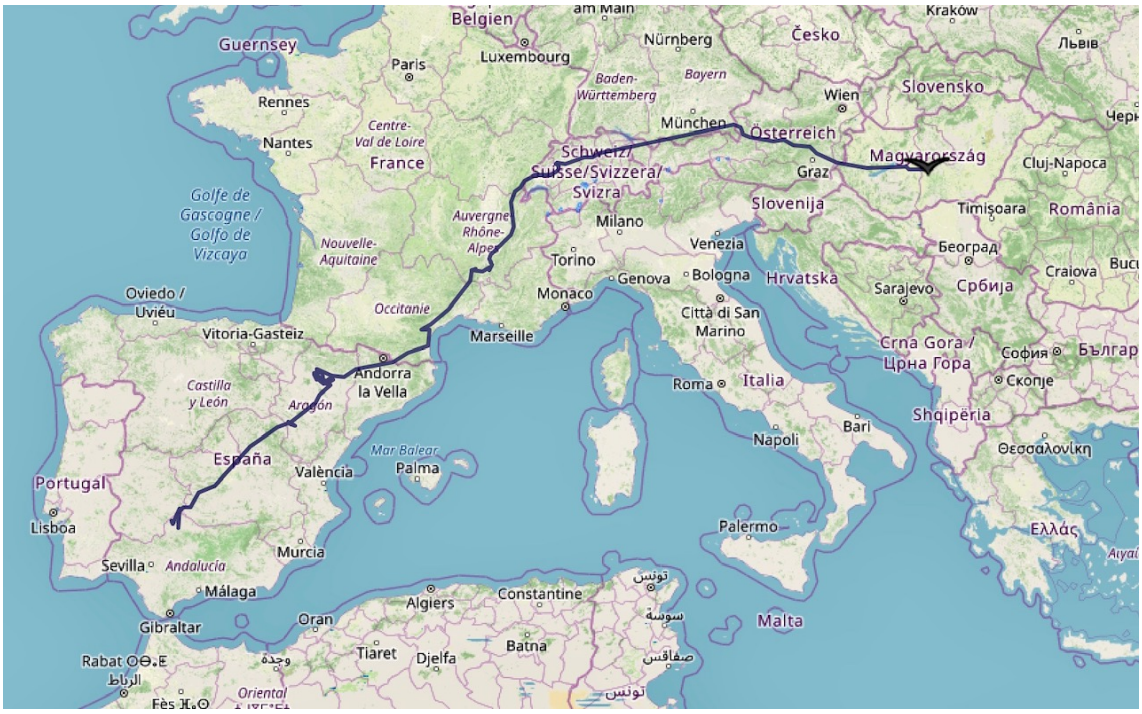


Figure nº 3:Spring route followed by Vilja from Los Pedroches to Hortobagy (BirdMap).

The migration of common cranes in Spain was described by Valverde and Bernis. Fernández Cruz included masses of data about migration in the Grus Project. The Alonso brothers (Alonso & Alonso 1990) focused their attention on spring (pre-breeding) migration at Gallocanta during the 1980s to estimate the wintering population in the peninsula. The effort in those decades was centred on knowing the wintering population and no tracking of the migration journey in Spain during both periods was made until the autumn of 2016 (Román 2017). Nevertheless, the post-breeding arrival route has been tracked since 2014 in Navarra (Lekuona 2020). Weekly censuses have been made at Gallocanta since 2005 (S.A.R.G.A.), so numbers can be extrapolated to a certain extent.

Since 2016, and thanks to a network of census participants and the profusion of social networks where crane sightings are now reported, we are collecting (as best we can) all these data. Obviously, the obtained figures never correspond with those of winter and are lower than them, which happens because a good part of migration happens at night, especially in autumn, which makes counting them very difficult, although these flocks can be detected and estimates can be made, but this would need a permanent network of observers, which we lack. Regarding nocturnal migration, this has only been studied in Navarra (Lekuona 2020), including these counts since 2016. These are more feasible to do at full moon, or increasing or decreasing phases with more than 50%, although the cranes prefer the new moon and nights closest to this phase, probably because it is easier to navigate by the stars (Lekuona *in lit*). Looking at the

published data, between 12 and 18% of the cranes that cross Navarra do so at night and it is possible that this figure is actually much higher, for the reasons previously given. This nocturnal migration is primarily post-breeding, as far as we currently know.

The chart for Navarra below shows the figures from censuses during pre- and post-breeding migration in this autonomous community from 2014to autumn 2019.

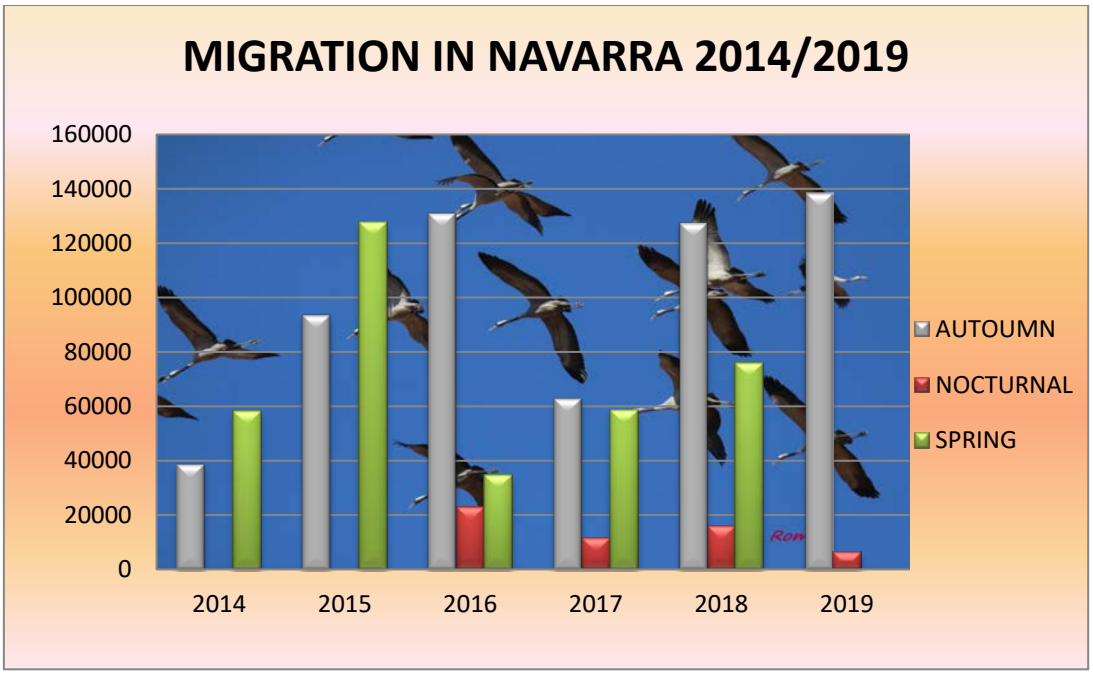


Chart nº1 Crane migration in Navarra from 2014 to 2019 (Lekuona 2020).


Picture nº 1: Cranes arriving at dusk at Gallocanta in late February. Photo José A. Román.

Regarding migration in Spain, and as we have already said, we collect all the information possible about it. The results from the seasons 2016 to 2019 can be consulted on the Grus Extremadura web site (www.grusextremadura.org) including the wintering reports.

The next chart (chart no.2) shows the results of these migration censuses. Generally more are counted in spring, for reasons including that it takes place in just two weeks, and if wind conditions allow, it is usually steady and continuous, so they are easily detectable. Also, it is a mostly diurnal migration, although some groups may be flying at night, usually because it got dark while they were looking for somewhere to rest. This is seen at Gallocanta especially at the end of the afternoon when flock after flock arrives until after nightfall, even after midnight. Birds stop until the following morning and set off again. However, during the autumn arrivals many flocks will continue on to their wintering quarters without stopping at the lagoon.

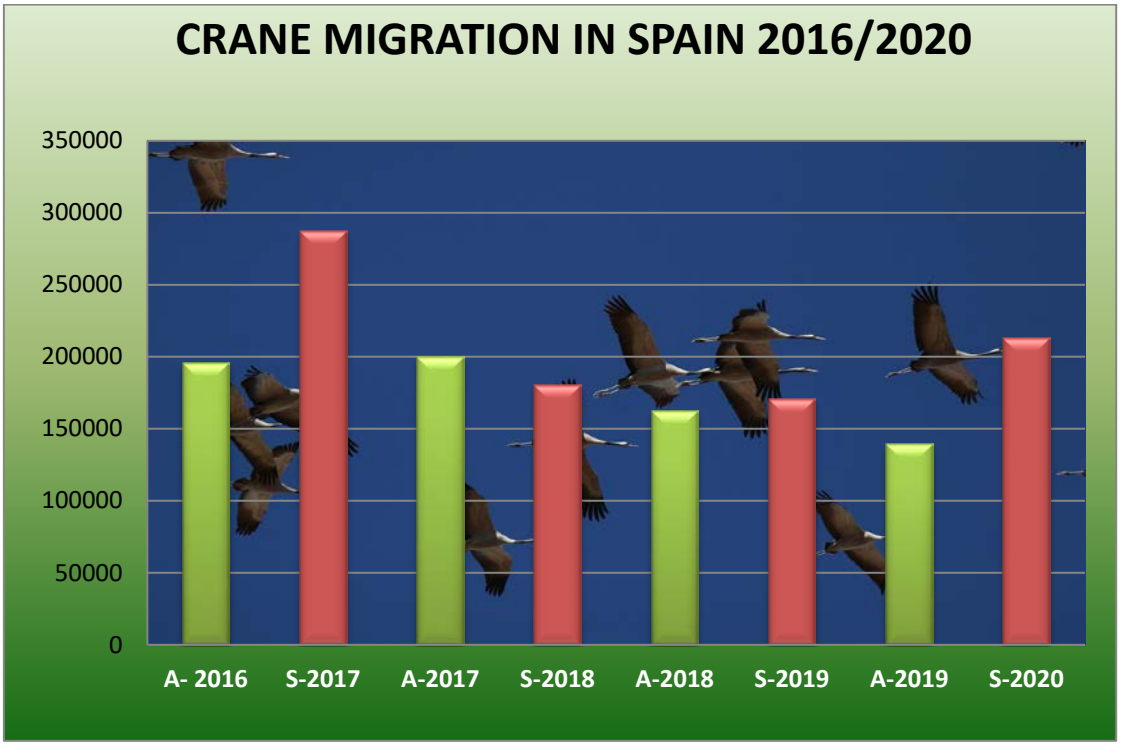


Chart nº 2: Common crane migration in Spain, 2016/2020 (A: autumn, S: spring)

We must also take into account that the number wintering in Iberia can be increased by other birds arriving from northern Africa, cranes that arrived in The Maghreb from the Italian Peninsula but then return through Iberia, as we have previously shown with the Estonian crane “Vilja”.

The following chart (chart no.3) shows migration by the autonomous communities where cranes arrive or depart from Iberia. During autumn the bulk of migrants arrive through the valleys of Navarra (up to 85%) from Landes, in Nouvelle Aquitaine, France (chart no.4). However, spring is different, as cranes that go to Gallocanta try to cross from Sotonera (Huesca), although half will go from Navarra (charts no. 4 & 5). The crossing is influenced each year by the wind, namely *El Cierzo*, which comes from the north-west. When this is strong it pushes them further east and can take them as far as the Pyrenean valleys of Catalunya, or even as far as the coast, which has happened occasionally.

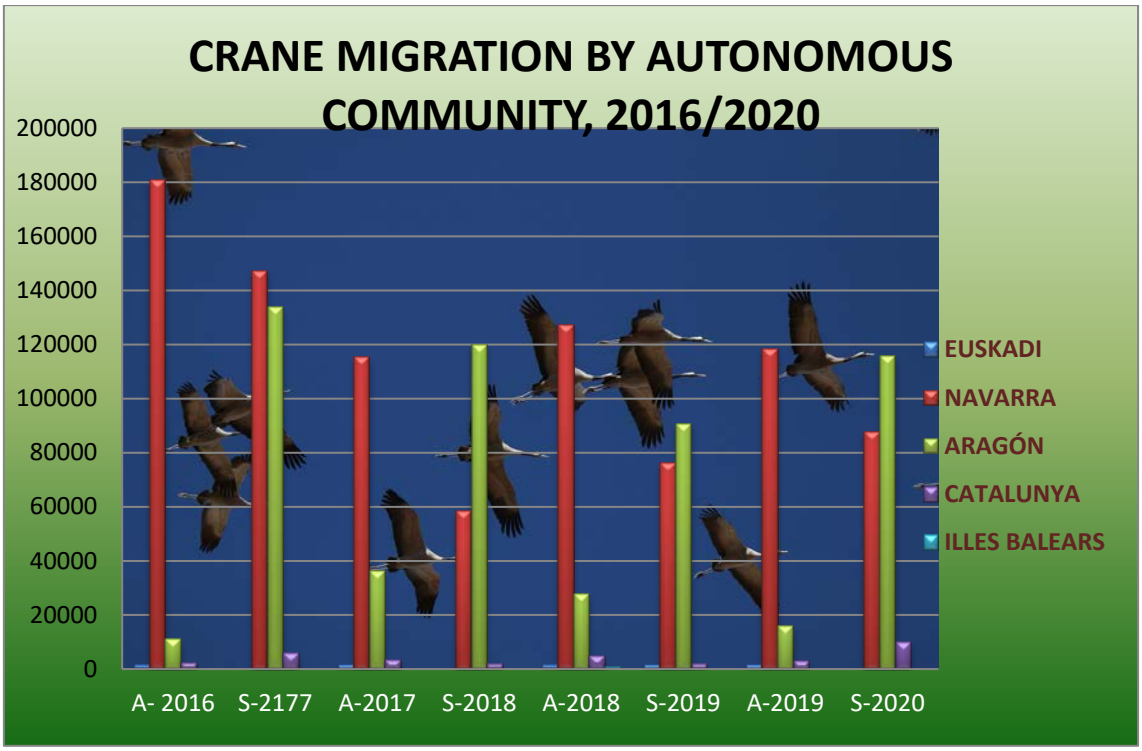


Chart nº3: Autumn (A) and spring (S) migration by autonomous community during the period 2016 to 2020.

Autumn migration through The Basque Country (Euskadi), is more significant than in spring, for the same reason as Navarra, but also as the cranes are heading north-east, going through this region would lead to delays.

The majority of cranes that enter Catalunya in autumn are heading south-west, although a minority continue down the east side, heading for the north of Africa. These cross directly from Murcia, Almeria or Malaga, not needing to go to the Straits of Gibraltar to get to this continent, except for those that winter in Morocco, which go via the centre and west of Spain (although some do arrive from the south of Spain). The spring numbers in this region are usually similar to autumn, or may be higher for spring migrants when *El Cierzo* pushes them there from Gallocanta.

Referring to migration through the Balearic Islands, very few birds have been detected (although the number could be higher), but the numbers are similar for both periods. The islands may act as a reference point for birds that head from the European continent to Africa and vice-versa.

Aragon channels almost all the migration in both periods as it has Gallocanta lagoon (Zaragosa/Teruel) as the key location, for birds resting after crossing the Pyrenees or before doing so. In autumn, those that cross into Navarra head for this lagoon and generally have a short break before continuing. For many years, having found the required tranquillity, cranes have wintered at this and nearby lagoons, and from here disperse to other wintering areas in Aragon.

Passage through Gallocanta is much faster in spring. Flocks generally arrive in the afternoon and leave the next day if meteorological conditions are favourable. Although many will go through Navarra, the majority however will try to go through the valleys of Huesca, using Sotonera as their last stop before going over the mountain range (Woutersen 2020). Here the pattern of arriving in the afternoon and leaving in the morning is repeated, the wind influencing the departures and their direction. Generally Sotonera is used over a longer period than Gallocanta(chart no.6), where it ends in the last week of February or first in March, although it begins later and goes on until the second week of March in Sotonera.

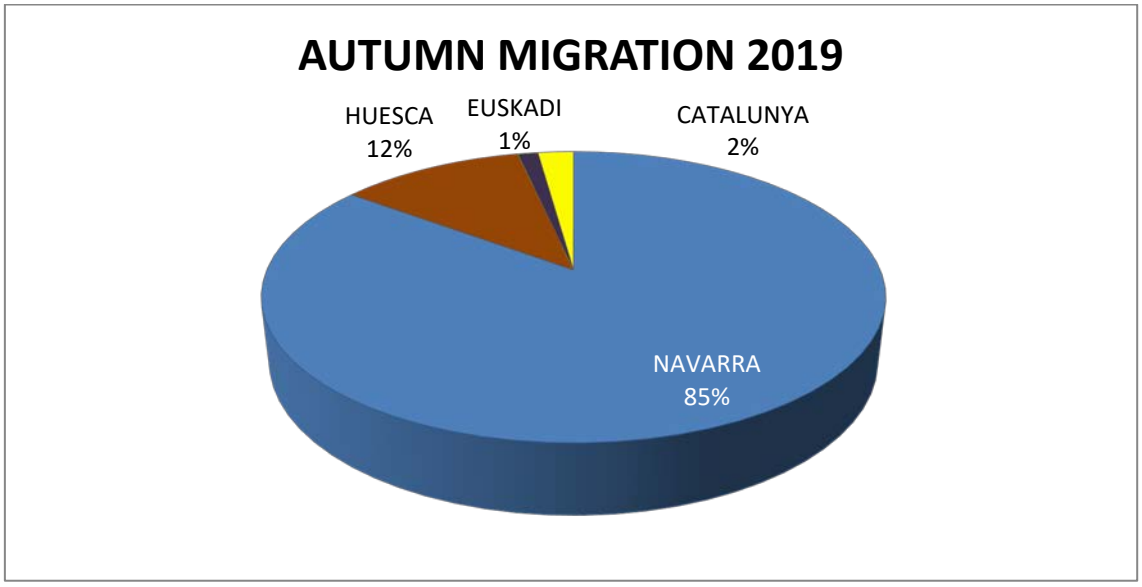


Chart nº 4: Post-breeding migration in 2019

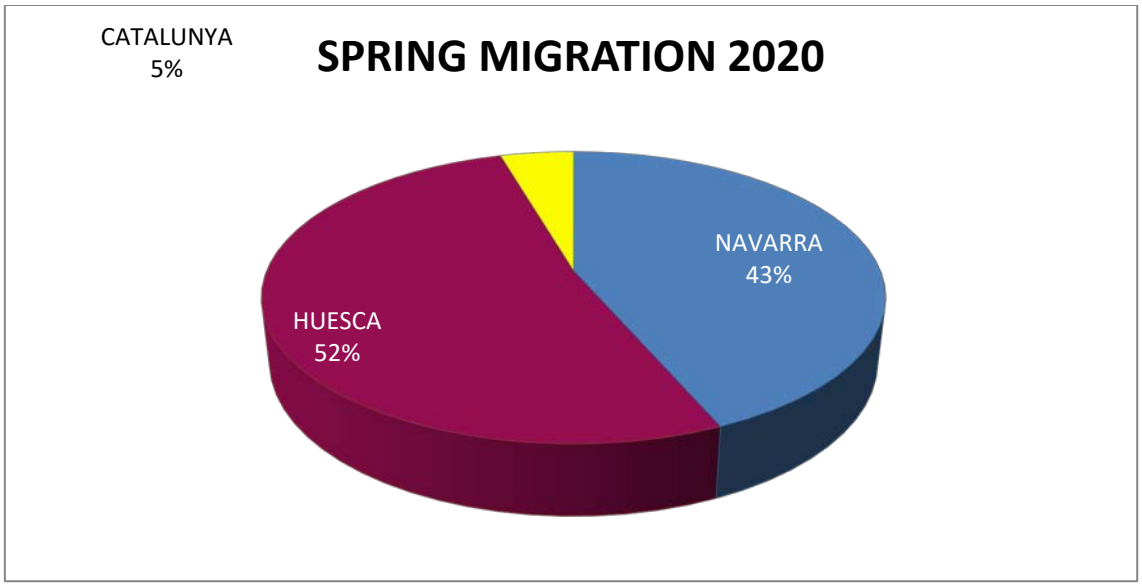


Chart nº 5: Pre-breeding migration in 2020

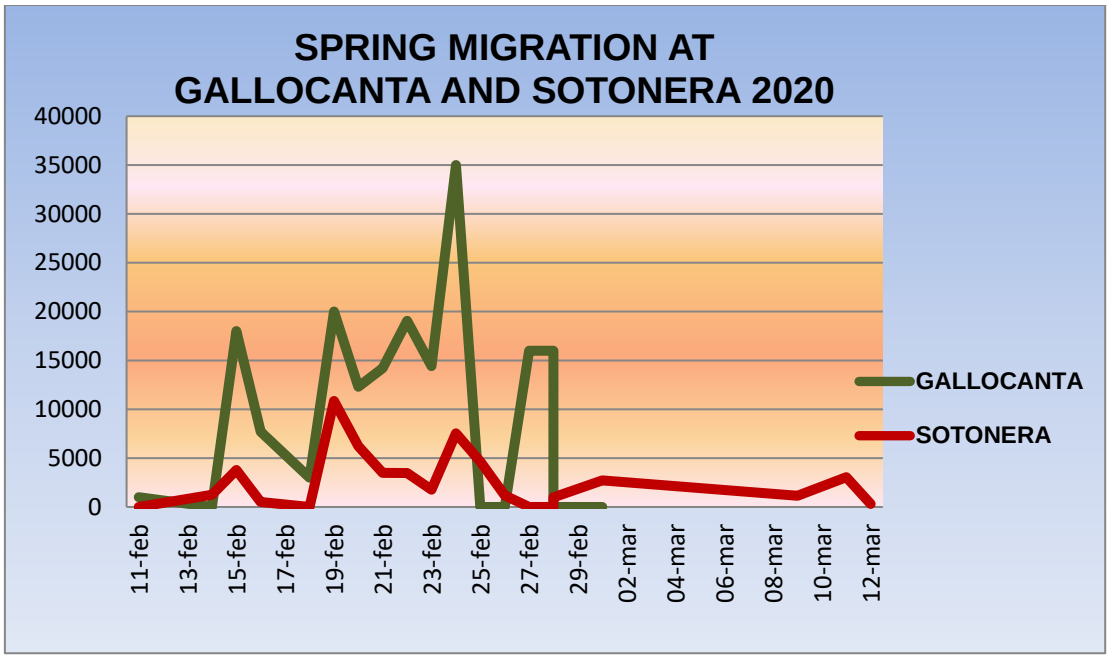


Chart nº 6: Daily comparison of pre-breeding migration in 2020 at Gallocanta and Sotonera

Since we have known about the phenomenon of global warming we are seeing that many species are advancing or delaying their migrations, and cranes are no different. Although migration monitoring has not been like the population study, we do have data from some locations, such as Gallocanta, where they have been censused weekly since 2006.

Autumn cannot be used as a reference because the migration is more leisurely and while in some years they arrive early, in others, such as 2019, they are much later through being held back by the weather in the north-east of France.

However, the spring migration can be analysed in detail, although it must be emphasized that they are weekly censuses (on the same day) and not daily, reducing the confidence margin. We therefore see that the fourth week of February has been the most significant in the majority of cases. Only in 2014 has it taken place in the second week.

In the last three seasons the third week has been shown to be the most important (as well as 2011). This could be because they have been years without problems with the wind and migration has remained constant and flowing every day. But this is not the general trend, far from it, as in some years it not only displaces the birds but also stops them and can create massive flocks for days, such as can be seen in years such as 2011, 2015, 2016 and 2018.

All of this shows that each year the migration is influenced by several factors, especially meteorological, such as wind or snow, and that each season is different, although in the last three years it seems the trend is to be earlier if the conditions are good (chart no.7).

However in some regions, such as Extremadura (the principal wintering area for the species) it seems the trend in recent seasons points to the leaving date being a few days earlier, although more data is needed to confirm this.

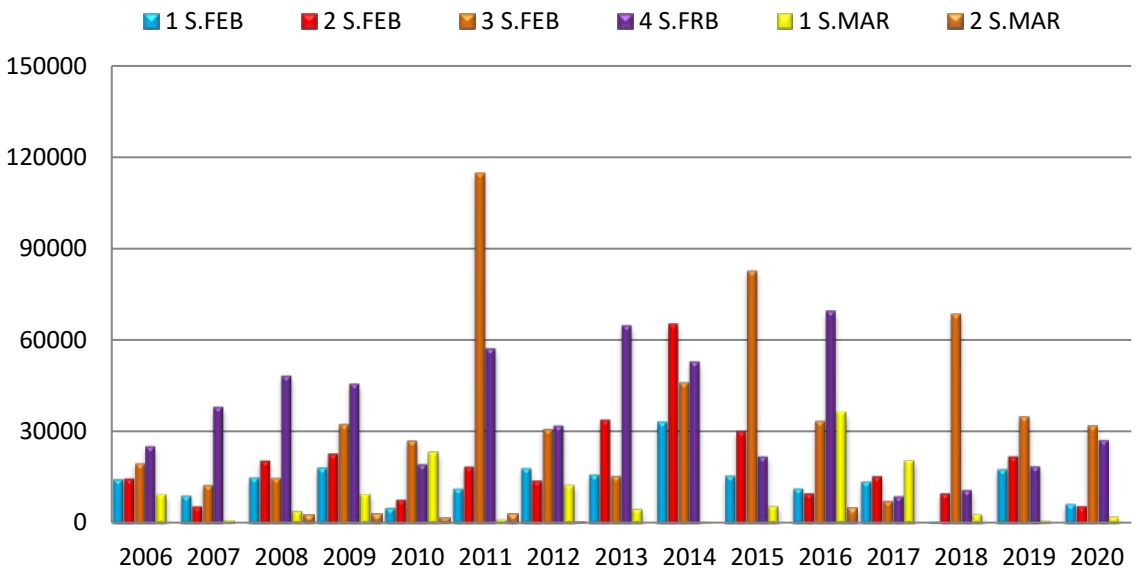


Chart nº 7: Weekly migration in spring at Gallocanta lagoon between 2006 and 2020. Source: census data from S.O.D.E.M.A.S.A. and S.A.R.G.A. (Government of Aragón).

BIBLIOGRAPHY

Alonso, J.C., Alonso, J.A. & Cantos, F.J.: “Crane spring migration over Gallocanta (Spain) Aquila 93-94: 213-222. 1987.

Alonso, J.C., Alonso, J.A., Cantos, F.J. & Bautista, L.M. “Spring Crane *Grus grus* migration through Gallocanta”, Spain. Ardea 78: 365-378. 1990

Alonso, J.A., Alonso, J.C. &Nowald, G.: “Migration and wintering patterns of a central European population of Common Cranes *Grus grus*”. BirdStudy 55: 1-7. 2008.

Bautista, L.M. “Grulla Común – *Grus grus* (Linnaeus, 1758)” Enciclopedia Virtual de los Vertebrados Españoles. Sociedad de Amigos del MNCN-CSIC. Madrid. 2009.

Bernis, F. “Aves migradoras ibéricas 1” (fasc.1-4) Sociedad Española de Ornitología. Madrid, 1966.

Fernández Cruz, M. (coord.): La migración e invernada de la Grulla común (*Grus grus*) en España. Resultados del Proyecto Grus (Crane Project). *Ardeola* 26-27:11-64. 1981

-Leito, A, Ojaste, I. & Sellis, U.: “The migration routes of Eurasian Cranes breeding in Estonia” Hirundo 24: 41-53. 2011.

Lekuona, J.M.: Estudio comparativo de la migración diurna/nocturna de la grulla, una experiencia en Navarra. II Jornadas Nacionales sobre Grulla Común en España. Añora 2020

Román, J. A., Lekuona, J. M., Onrubia, A., Mooser, R., Wourtensen, K. 2016. Migración e invernada de la Grulla Común (*Grus grus*) en España y Marruecos. Temporada 2015/16. Grus Extremadura.

Román, J. A. (coord.): *Fenología y distribución de las Grulla Común* Grus grus *en España durante 2016/19*. Grus Extremadura. 2016, 2017, 2018, 2019, 2020.

Román, J.A. La Grulla Común. Monografías zoológicas, serie ibérica, vol. 7. Tundra ediciones. Castellón 2019.

Salvi, A.: La Camargue, confluence des voies de migration européennes des Grues Cendrées *Grus grus*. *Aves*, 53/2: 49-69. 2016

Valverde, J. A. Le passages des Grues cendrees en Castille. *Nos Oiseaux*, 21: 196-198. 1952

Woutersen, K.: Condiciones climáticas y la migración de las grullas. La Sotonera-Montmesa (Huesca), primavera 2020. Grus Extremadura.