Finding and sampling colour ringed Black-tailed Godwits (*Limosa limosa*) in Parque Natural de l'Albufera (Valencia, Spain)

Spring staging February 1st till March 15th 2021 Expedition report



René Faber, Toni Alcocer Cordellat, Jos Hooijmeijer & Theunis Piersma



Figure 1 Black-tailed godwits in L'Albufera photo Toni Alcocer Cordellat

Acknowledgements

The birders of Birding Albufera [https://birdingalbufera.es/es/nosotros.html]

who are dedicated to birdlife in L'Albufera and provide the research on Black-tailed godwits with much information about their timing, whereabouts, numbers and colour ring codes

The (people of the) 'Ayuntamiento de València en la Devesa de la Albufera', who for the past years have provided us the required permits to enter (reserve) areas that are crucial to our expeditions.

Contents

The items I. – VI. in this report are based on and partly identical to the items in previous reports about searching and finding Black-tailed Godwits in Spain.

I. This report

- II. Demographic research Southwest Friesland
- III. Expeditions West-Africa and Iberia
- IV. Wintering sites Black-tailed Godwit
- V. Spring stopover in Iberia

VI. Summary and Background information of the l'Albufera Natural Park
VII. Organisation of the 2021 Expedition in L'Albufera
VIII. Maximum number of Black-tailed godwits and colour ringed birds
IX. Turnover rate
X. Ring Density
XI. Site fidelity

Appendix A Daily reports Appendix B Area Maps Appendic C Literature

I. This report

All through the spring staging period of 2021, (flocks of) Black-tailed Godwits were monitored in Parque Natural de l'Albufera, southeast of Valencia. We recorded resightings of individual birds, counted as well as sampled the flocks. In this report a daily overview is presented with photos, locations which were visited, turnover rates and site fidelity of the colour ringed godwits.

Information on Black-tailed Godwits

The Black-tailed Godwit (*Limosa limosa*; hereafter godwit) is a grassland breeding wader (Verstrael 1987; Thijse 1904). The current Dutch population is estimated at fewer than 30.000 breeding pairs (Kentie et al. 2016) and represents more than half of the total continental godwit population *Limosa limosa limosa* and 85% of the NW-European breeding population. However, the number of breeding pairs have declined rapidly over the last decades, as compared to the 120.000 pairs in the 1960s (Mulder 1972). This is mainly caused by a change in agricultural land use and urbanisation, and as a side effect increased depredation rates. Intensification and rationalisation of land use have led to degradation of the breeding habitat, resulting in low reproduction. The population in the Netherlands cannot produce enough chicks for a stable population (Vickery et al. 2001; Newton 2004; Tscharnke et al. 2005; Teunissen & Soldaat 2006; Roodbergen et al. 2012), which is annually the case for decades now. After the breeding season godwits migrate to southern Europe (Spain and Portugal) and West-Africa where they stay for wintering (Márquez-Ferrando et al. 2009; Hooijmeijer et al. 2013).

II. Demographic research Southwest Friesland

To measure the changes in population numbers and the causes, in 2004 the University of Groningen started a long-term research in the south-western part of Friesland, The Netherlands. Since then the research area has expanded to more than 11.000 hectares (Groen et al. 2012). A colour-marked population of godwits was set up to make them individually recognizable to study their breeding ecology, survival rates and migratory movements.



Colour ringed Black-tailed Godwits of French (left) and Dutch scheme (right) photo: Yanina Maggiotto

III. Expeditions West-Africa and Iberia

In November 2014 the University of Groningen, in cooperation with Global Flyway Network and financially supported by Birdlife Netherlands, embarked upon their first expedition to the wintering grounds in West-Africa and since then we visited the area 2-3 times per year. We aim to set up a demographic research project in this area in close cooperation with local scientists, volunteers and conservation organisations. The most important goal of the first missions was to get a good overview of the wintering grounds, resighting conditions, local facilities and knowledge and to make a start with setting up a dataset of individually recognizable godwits that winter in West-Africa. Secondly we made a pilot study of habitat choice and prey choice. Comparable research has already been done in Extremadura (Spain) and the Tejo/Sado estuaries near Lisbon (Portugal) since 2007 and in NP Doñana (Spain; since 2009). These are the most important stop-over sites in February. Since 2013 yearly spring staging expeditions have been made to the L'Albufera estuary on the East Coast of Spain. Here colour ring reading, counts and ring density sampling has been performed. In 2021, for the first time, research was performed all through the staging period from 1 February – 15 March 2021.

IV. Wintering sites Black-tailed Godwit

In 1983-1984 the wintering sites of godwits were explored for the first time. At that moment most godwits were wintering in rice areas along the West-African coast in Senegal, Gambia, Guinea-Bissau and further. Big numbers of godwits also occurred in the inner Niger delta in Mali (Altenburg & van der Kamp 1985), but they probably belonged to the eastern European population. Recently, the wintering behaviour has partly changed with an increasing number of godwits deciding to winter in southern Spain at National Park Doñana. In the 1980s during the first counts, only 4% of the NW-European population used this area as a wintering site but recent estimations suggest a big change with up to 23% of the population wintering in Spain. The most important reason for this is probably the creation of new artificial fishponds and rice fields. It is remarkable that this increase is not driven by climatic changes in the Sahel zone of West-Africa (Márquez-Ferrando et al. 2013). For godwits, staying Iberia can be advantageous because they can skip a 3000 kilometre (v.v.) travel over the Sahara, a potentially dangerous migration route and save their fat stores for the next breeding season. The change in wintering grounds is remarkable and an important reason why we started to do (demographic) research in West-Africa. We know now that juveniles are more likely to make these kind of shifts than adults (Verhoeven et al., 2017), but not how they develop their individual migration strategy and perhaps thereby change the migration pattern of the species. These changes can also have consequences for the survival rate of both adults and juveniles. Moreover, they can lead to differences in reproductive success, for example due to differences in body condition upon arrival on the breeding grounds. Both are demographic parameters that can rapidly influence population dynamics. A better understanding of these processes is therefore also important from a conservation point of view; the Black-tailed Godwit qualifies since 2006 as "Near Threatened" on the IUCN Red List.

We don't receive many observations of colour-marked individuals from West-Africa but since we started regular expeditions in 2014, we have accumulated much information on individuals that cross the Sahara.

Research questions we want to get into in the future with our work in West-Africa, Spain, Portugal and the Netherlands are:

- What is the overall difference in adult mortality between birds wintering in West-Africa and Iberia? And where along the flyway do these differences occur?
- Can birds change their wintering strategy during their life? And is this age-dependent?
- Does reproductive success determine where birds winter?
- Has the wintering strategy consequences for their migration and breeding phenology? And are there consequences for their reproductive success?



Five important areas where many godwits can be observed during January-March: Extremadura (1), Donaña NP (2), Tejo-Sado estuaries (3), L'Albufera NP (4), Ebro delta (5).

V. Spring stopover in Iberia

Mainly from December onwards, Black-tailed Godwits leave their wintering areas in West-Africa to stopover areas in southern Iberia where they join the godwits that already moved there earlier or did not cross the Sahara at all. Here they are largely confined to three areas: Doñana NP and Extremadura in Spain and the rice fields surrounding the Tejo and Sado estuaries near Lisbon in Portugal, with smaller numbers passing through the Spanish east coast (especially L'Albufera and Ebro delta). Since 2007 these areas are visited by experienced volunteers and researchers from the University of Groningen in search for colour-ringed godwits. Resighting colour marked birds during the stopover period is important for several reasons:

- 1. If a godwit disperses outside our study area, the chance that it will be resighted elsewhere in The Netherlands is small. Without the resightings in the stopover area, we would assume that this individual is dead and therefore underestimate annual survival.
- Secondly, with enough resightings in the Iberian Peninsula we can calculate seasonal survival. In other words, we can calculate in which period of the life cycle mortalities occur more often. Or we can find out if birds cross the Sahara have a different survival rate than birds that stay the entire winter in southern Europe.
- 3. By measuring the density of individuals with colour marks, we can monitor the population size of the western European part of the Black-tailed Godwit population. In 2016 we published a scientific paper about this, a true milestone summarizing 9 years of fieldwork in Iberia (Kentie et al., 2016).

VI. Summary and Background information of the l'Albufera Natural Park

The l'Albufera Natural Park, just south east of Valencia, is an important 14.100 ha wetland for many thousands of wintering and migrating waders and ducks along the Mediterranean coastline, including Black-tailed Godwits. They use the area during southward migration from June to September. In October numbers start building up and 200-300 birds spent the winter here; from early February numbers start to increase and they peak at about 2500-3000 individuals in late February; by half March most birds have left.

The 3.114 ha freshwater lake Laguna de l'Albufera is the centre of the park; it is the remains of a brackish lagoon and surrounding marshlands, that sized about 30.000 ha in the 18th century. It is only 1,5 m deep and it is nowadays on all sides surrounded by rice field complexes, called tancats. In February and early March, Black-tailed Godwits forage in the lowest, wettest areas/ tancats near the lagoon. They follow the trail of recently ploughed fields, which makes it easy to predict where to spot them next. In the recently ploughed fields they find spilled rice grains, invertebrates and also a



Figure 2 Ricefields surround the l'Albufera lagoon; by the midst of March ploughing is finished

lot of earthworms. The tancats near the lagoons are ploughed latest by the farmers. Sometimes the drainage of the in wintertime flooded rice fields starts already in December, further away from the lagoon. This process continues towards the lagoon (lowest part of the coastal lagoon). Normally the rice fields are completely dry by half March; also because the drainage has been optimized in recent years, apparently one of the reasons why the abundance of earthworms has increased, because long-term flooding is detrimental to worm populations. After ploughing they stay dry until after the rice has been sown in late May nowadays. The new rice cultivars need less water and keeping the fields dry ensures less weed pressure. These dry conditions have led to serious declines in local breeding bird populations. A new threat is the landscape wide spraying of pesticides against mosquitos by airplanes or from helicopters. It is supposed to be a measure against tiger mosquitos but is also to please the tourist industry. Off course this has serious consequences for the food condition for birds because the non-stinging Chironomids are eradicated as well, depriving birds of a key food source.

Another important factor is the hunting pressure. The hunting season starts in October and ends at the first weekend of February. According to local information, the hunting pressure is severe. This might have contributed to the strong decline in many waders and waterfowl in the past decades. It is experienced that there's not always adequate differentiation between non-protected and protected birds. This might mean that Black-tailed godwits can also be shot. The Raco de l'Olla Reserve, founded in February 1993, between El Saler and El Palmar is a safe haven. It is a small, new reserve

created out of a former racecourse for horses. Most ricefields that are kept wet during winter are also used for hunting.

During the 2021 prenuptial staging season we counted a maximum number of about 2300 godwits. The East coast of Spain is known to be used more frequently by eastern godwit populations, whereas most of the Dutch population passes through Portugal and western France. Icelandic godwits are rarely found in this area.

In the morning most birds seem to come together at the Raco de l'Olla Reserve. There is no indication that it is used as a night time roost; locations from birds with satellite transmitters suggest that the main roost could be at San Roc, an island on the west side of the Laguna. Artificial wetlands like Tancat de Milia and Tancat de la Pipa are also used for roosting, as -sometimes- are largely inundated tancats.

In 2021, until the 25th of February, in the course of the morning the godwits left the Reserve and flew towards the tancats to forage, but there are always a few hundred birds that remain in the reserve. Ring reading suggests a lot of exchange between the different suitable, freshly ploughed tancats and the Reserve. After the 25th of February godwits spend most of the daytime at the reserve, leaving the ricefields 'unused'. Satellite data of 'Wolvegea' showed evening activities in the ricefields. This suggests a shift from daytime foraging to evening foraging.

In total 731 resightings were made from 1-1-2021 to 18-3-2021, with 7 resightings before 1-2-2021. Of the Dutch RUG scheme, in total 53 colour ringed and 7 code flagged individuals were recorded. 124 resightings from 18 birds from other schemes were made: 2 UK breeding birds (12 resightings), 7 Finnish breeding birds (44 resightings), 1 French breeding bird (14 resightings) and 8 German breeding birds (54 resightings).



NYN/mYR, a regular staging (and wintering) bird) photo: Pedro Marin Prado

VII. Organisation of the 2021 Expedition in L'Albufera

The expedition in L'Albufera in 2021 was founded on four pillars:

1. The counts and ring reading in the Raco de L'Olla reserve on practically all weekdays, except for the weekends.

2. Field work conducted by Toni Alcocer Cordellat on February 9, 11, 15, 17, 18, 21, 22, 23, 25 & 26 + March 1 & 3.

3. The additional support of several observers that monitor birds in L'Albufera.

4. The coordinative skills of Nacho Dies who provided the field observers with accurate and most timely information on the whereabouts of Black-tailed Godwits.

Field days were based on information of satellite tagged Black-tailed Godwits; information on the presence of the Black-tailed Godwits provided by visitants of the area; patterns of presence distilled from previous years and; -of course- the availability of the observer(s).

Next to counting, ring reading and sampling of flocks in tancats where the Black-tailed godwits were found, the field observer also checkout unused tancats and described the habitat conditions of the paddies.

This has resulted in a pretty complete oversight of the spring staging Black-tailed godwits in L'Albufera in 2021. Before the 25th of February resightings and counts were made in both the Raco de L'Olla reserve and the ricefields.

We pity the fact that from the 25th of February the godwits hardly were to be seen in the ricefields during daylight. Data of satellite tagged bird Wolvegae showed her presence in the ricefields in the evening in the period between the 25th of February and the 8th of March. Reconnaissance missions during daylight revealed suitable habitat conditions of the tancats which were visited by Wolvegae in the evening. Why the godwits shifted to evening foraging in the tancats, is unknown. From February 25th onwards all counts and readings were performed in Raco de L'Olla.

The results of the expedition are presented in the following paragraphs.



VIII. Maximum number of Black-tailed godwits and colour ringed birds

Figure 3 shows the maximum numbers of godwits counted between 2015 and 2021.

The build up and maximum numbers in 2021 appear to be fairly similar to the staging year of 2016, with a later peak than most other years.

righte 5 maximum numbers of Black-lanea Gouwis counted between 2015 and 2021



Figure 4 Resighting dates of Dutch (RUG) scheme colour ringed Black-tailed Godwits. r=resighting s=satellite data

Figure 4 shows the presence of 43 Black-tailed Godwits of the University of Groningen (RUG) colour ring scheme between the first of February and the 15th of March 2021.

These 43 godwits have been identified as 'sure' resightings, because they have been seen by 2 or more observers and/ or have been photographed and/ or have been resighted 3 or more times. 10 resighted colour ring codes of the RUG scheme did not meet the above mentioned demands and were not included.

The figure shows signs of about 5 major moments of influx in L'Albufera: February 1, 9, 15, 17, 21-23. On the 25th of February the maximum number of Black-tailed godwits seemed present, also showing the largest amount of colour ringed godwits. Satellite data of Estevao, Warnserpolder and Wolvegae did not deviate from the resightings on 'ground level'.



Figure 5 Resighting data of Dutch (RUG) codeflagged Black-tailed Godwits

Figure 5 shows the resignted RUG scheme birds with a (Lima or Green) codeflag. As their reading possibility is much lower, conclusions are harder to reach about their presence and timing. The figure does show a similar pattern as their colour ringed fellow birds.



Figure 6 Resighting data of non Dutch coloured ringed Black-tailed Godwits

Figure 6 shows the presence of Black-tailed godwits from the UK, French, Finnish and German ringing schemes. The German birds show a similar pattern to the Dutch birds, the Finnish birds arrive later and stay for a shorter period. It should be noted that after the midst of March L'Albufera is dry, which makes the area unsuitable for foraging in the ricefields. The number of godwits then steeply drops to nearly zero.

IX. Turnover rate

Our first ever full spring staging monitoring period also enables us the calculate the turnover rate. The Dutch colour ringed birds spent at least 16,8 days in L'Albufera. The code flagged, Dutch birds 17,1 days. We state 'at least', as we didn't observe the birds daily and had to cope with the difficulty that from the 25th of February onwards, the Black-tailed godwits weren't seen in the ricefields anymore. Birds then had to be observed at the reserve of Raco de L'Olla, where they populate in dense flocks and hardly forage. This makes ring reading very time intensive and hampers the resighting possibilities.

The turnover rate of German godwits (15,8) seems comparable to the Dutch birds, but here also the more difficult readability of the ring combinations could influence the calculated turnover rate. This also could be the case for the Code flagged Dutch birds.

The UK and French breeding birds were in too low a number to draw any conclusions.

The Finnish colour ringed birds show a shorter turnover period than the Dutch birds. Here the more difficult readability could be hampering conclusions as well. It should be repeated though, that experience tells that most Finnish birds arrive late and might then leave quickly because the L'Albufera ricefields have dried up as all ploughing has been finished by then.

X. Ring density

During the 2021 expedition 31 samples were performed on the flocks. Almost all samples were performed in the ricefields. Here conditions are ideal as the Black-tailed godwits are foraging and walk from right to left (or left to right...). Legs and colour rings are well visible and best distinguishable. Furthermore, counting the number of Black-tailed godwits is easier.

A total number of **12.295** Black-tailed Godwits were sampled, of which the overall ring density was **28,46**. The density of RUG colour ringed godwits was **36,27**. The density of non RUG colour ringed godwits was **132,2**.

Dutch code flagged birds were excluded in the resighting densities!

Zooming in on the previously mentioned, 5 major influx moments, the following ring densities were recorded:

	Number of Black-tailed	Ring density								
Date	godwits sampled	All schemes	RUG scheme	Non RUG schemes						
1-2-21	120	15	17	120						
9-2-21	639	29,05	39,94	106,5						
15-2-21	1791	29,35	37,31	137,8						
17-2-21	1320	26,4	31,43	165						
21-1-21	3166	25,42	32,61	136,36						
25-2-21	2300	28,05	35,38	135,3						
Overall between 1-2-21 and 12-3- 21	12295	28,46	36,27	132,2						

Ring densities are high and seem fairly stable throughout February. Unfortunately, no sampling could be performed in the ricefields in March 2021. This makes ring density comparisons between February and March less valid. We presume that sampling in March would have shown lower RUG densities and higher non RUG densities. This presumption is based on experiences in prior years and the fact that the Finnish colour ringed birds arrive late in the prenuptial staging period.

XI. Site fidelity

N(umber) of colour ringed btg resighted per year									Relative N(umber) of colour ringed btg resighted per												
Year of ringing	Nbtg	2013	2014	2015	2016	2017	2018	2019	2020	2021	Year of ringing	Nbtg	2013	2014	2015	2016	2017	2018	2019	2020	2021
2006	1						1	1	1	1	2006	1						100%	100%	100%	100%
2007	2	1			1		1	1	1	2	2007	2	50%			50%		50%	50%	50%	100%
2008								1			2008										
2009	3	2	2	2	1	2		3	3	3	2009	3	67%	67%	67%	33%	67%		100%	100%	100%
2010	1			<u> </u>	1	1	1	1	1	1	2010	1	_			100%	100%	100%	100%	100%	100%
2011	2	1	2	2	2	1	1	1	1	2	2011	2	50%	100%	100%	100%	50%	50%	50%	50%	100%
2012											2012					1					
2013	6		1	3	4	2	5	3	4	6	2013	6		100%	50%	67%	83%	83%	50%	67%	100%
2014	6				2	2	2	4	5	6	2014	6				33%	33%	33%	67%	83%	100%
2015	7				4	6	4	7	5	7	2015	7				57%	86%	57%	100%	71%	100%
2016	2					1	2	2	2	2	2016	2					50%	100%	100%	100%	100%
2017	3						3	2	1	3	2017	3						100%	67%	33%	100%
2018	1			1	1			1	1	1	2018	1							100%	100%	100%
2019	6								6	6	2019	6								100%	100%
2020	3									3	2020	3				1 1					100%

Figure 7 site fidelity of colour ringed Dutch (RUG) Black-tailed Godwits

From our expeditions in previous years, we already had the impression that many birds we resighted were regular 'stagers'. The monitoring of the flocks during the whole of spring staging has confirmed our assumptions.

Figure 7 shows the site fidelity of the resignted, Dutch (RUG) colour ringed birds. Site fidelity is high. All colour ringed birds that were resignted in 2021, have been resignted in previous years, in at least 2 or 3 of the previous years since 2013.

Except for the birds that were ringed in the same year as the staging year, considering the fact that most birds are ringed in the breeding season.

All but three of the birds that visited L'Albufera during the 2021 spring staging, have never been reported at the Tague Estuary or Extremedura. In case of 3 of the 53 Godwits that were resighted in 2021, the life histories make us wonder whether they have shifted their springstaging from the Tagus Estuary (one bird) or Extremadura (two birds) to L'Albufera. One colour ringed bird that was resighted (with photo-proof!) in 2021 in L'Albufera, in previous years always was seen in the Tagus Estuary.

In case of the two birds that seem connected to Extremadura, we wonder if they first stop over in L'Extremadura and then head for the Spanish Eastcoast, before moving North to their breeding grounds. The small number of Black-tailed godwits and dependence on the trustworthiness of the ring reading makes these impressions hard to prove.

Do these three birds show individual behaviour, that differs from a furthermore high repeatability of movements?

Most of the birds that were ringed as a chick, are resighted in the second calendar year after ringing. We do also resight (code flagged or colour) ringed chicks that have been seen in L'Albufera passing by in summer, on their first southward migration.

Appendix A

Field day 1 - 09 February 2021.

I leave home (Valencia city) at 7:30. Cloudy day, no wind and temperatures around 18 °C. As it is very cloudy the light is scarce, which will make it difficult to read the rings, but on the other hand, it will also avoid annoying backlighting.

I go directly to the Racó de l'Olla Nature Reserve where the reserve brigade (Nacho Dies and Miguel Chardí) are already waiting for me to accompany me to the reserve area and explain the most suitable places where Godwits could be observed, although the level of the reserve area is currently quite high and they are not often observed in this area, but in front of the



public observatory, where just over a hundred birds are resting in front of the observatory together with stilts (Himantopus himantopus).

After checking the reserve area and seeing that there are no godwits in this area, we moved to the public observatory where we found a flock of 123 birds roosting in front of the observatory on the island.

Between myself and the reserve brigade, we managed to read 8 rings, the total number of marked birds in that group. At 9:34 about a hundred birds flew away and left the reserve.

Estevao (L3BRRB) is one of the few birds that do not leave the Racó de l'Olla reserve to go and eat in the marshes.



Figure 9 Views from the Ponent observatory of the island where the Godwits sometimes rest.



Figure 10 Taking of Limosa ring controls.

After finishing reading the rings in the Racó de l'Olla N.R., I move to the marshes to check out the appropriate areas where I could find Black-tailed godwits, checking flood levels, mudflats and areas suitable for godwits. The marshes in the southern part are checked, as the ones in the north, the flooded areas, still have high levels of flooding and are not suitable for Godwits. The marshes of Sueca and Sollana are checked and although some areas have appropriate flood levels or are being flooded, Godwits are only found in the tancat of El Malvinar (Sueca). Among many others, the tancat de l'Estell, south of El Palmar, where groups of Godwits were observed two days ago, although none have been observed today.

At 11:30 several groups of Black-tailed godwits can be found feeding and resting at El Malvinar. The total number of godwits present is not very high, 450 birds in several flocks that vary in number after each flutter.

From 11:30 to 15:00 I read rings of the different flocks present in El Malvinar, and I was able to score 22 different codes.



Figure 11: System used for the control of Black-tailed godwit rings.



Figure 12: C1GGW feeding at El Malvinar.



Figure 13: Plots used by Black-tailed godwits to feed in the tancat of El Malvinar.

At 15:00 I leave El Malvinar and check some areas without positive results. Lastly, I checked the tancat del Recatí, where there were a large number of glossy ibis (*Plegadis flacinellus*) and gulls (*Larus fuscus, michehellis* and *Chroicocephalus ridibundus*) but no Black-tailed godwit was observed.

Field day 2 - 11 February 2021.

I leave home (Valencia city) at 7:30. Sunny day, no wind and temperatures varying from 15 to 20°C throughout the morning.

I go directly to the Racó de l'Olla N.R. (8:00) where the reserve brigade (Nacho Dies, Miguel Chardí and Julián Gijón) are waiting to accompany me to read codes. After checking the reserve area and making sure that there are no godwits, we go to the public observatory, where on the island in front of us there are only 9 godwits among the stilts (*Himantopus himantopus*) and ruffs (*Phylomachus pugnax*). At 8:54, a group of 30 birds arrive and roost on the island, making a total of 39 birds. Yanina Maggiotto is in the bunker in the reserve area and sees another group of 11 birds arrive that were not there earlier in the day, but none of them are marked. Between the 39 in the public area and the 11 in the reserve, there are 50 birds in the Racó at first light, of which only one ringed bird -French WGR/R[FR]W- was already seen in the Racó a few days before.



Figure 14: Checking the godwits from the public observatory.

At around 9:30 I leave Racó de L'Olla to go to the marshes to look for where the godwits are feeding. On the way I check L'Estell/ Establiment and the marshes on the way to El Malvinar (Sueca) without seeing any *Limosa*. I arrive at El Malvinar at 9:45 and the whole tancat is already muddy (there are no tractors working, they have all finished) and there is practically no water left on the surface, although some fields could still be used to feed the Godwits.



Figure 15: Current appearance of the El Malvinar tancat (Sueca).

In the whole tancat I can't see a single marlin and there are hardly any concentrations of seagulls in any field, the water level has practically disappeared in just two days and with it the birds.

Then I start to drive through all the marshes in search of the godwits. The marshes of Sueca, Sollana, Valencia, Silla, Alfafar and Catarroja are checked, practically all the marshes in the P.N. of l'Albufera de Valencia. In none of the areas surveyed do I observe other waders feeding as ruffs, sandpipers (*Calidris* sp) or plovers (*Charadrius* sp), which could be indicative of the lack of suitable feeding areas for waders, including godwits, although in several areas of the N.P. there are mudflats and recently mudflatted fields, a priori good for waders.

Checking all the marshes for godwits takes me 3 and a half hours (9:45-13:15), at which point I return to El Malvinar in case the godwits have returned. Throughout the morning I am in contact with Nacho Dies in case there are godwits in the Racó, but to no avail. After looking for the godwits all morning I decide to leave at 14:00 and it is then, on my way home (14:15), when Nacho tells me that they have just seen a flock of about 200 godwits flying over the Racó without them getting in as a Eurasian sparrowhawk (*Accipiter nisus*) is

The fact that there is a group of Black-tailed godwits in the National Park, as observed at 14:15 from the Racó, suggests that the godwits that may be in the Albufera have spent the whole morning resting on the Sant Roc (island) (inaccessible) and have therefore gone completely unnoticed.

still scattering them in flight over Racó de L'Olla.

Field day 3 - 15 February 2021.

I leave home (Valencia city) at 7:30. Very cloudy day (it had been raining most of the night before), with practically no wind and temperatures varying from 12 to °C16 throughout the morning and part of the afternoon.

I go directly to the Racó de l'Olla N.R. (8:00) where the reserve brigade (Nacho Dies, Miguel Chardí and Julián Gijón) are waiting to accompany me to read codes. After checking the reserve area, we observe a group of 271 birds, of which we can read 8 codes. After making sure that there were no more marked birds, we moved to the hide at the public lagoon, where, as soon as we entered the hide, some 200 godwits flew away and left the reserve without giving us time to check them.

On the island in front of the public observatory, among the black-winged stilts (*Himantopus himantopus*) and ruffs (*Phylomachus pugnax*) there are 161 Black-tailed godwits, among which we make four codes, including Wolvegea.

At 9:45, I leave the Racó de l'Olla N.R. to go to the marsh, as several groups are leaving the N.R. towards El Palmar, so they are probably in the tancat de l'Estell (Sueca), as they were observed yesterday in the same area.

In the Racó de l'Olla N.R. 271 godwits are checked in the reserve area + 161 in the public area (432 birds) + approximately 200 more that fly out of the public area before they can be checked, making a total of approximately 630.



Figure 16: Glossy Ibis (*Plegadis falcinellus*) and Black-tailed godwits in the Racó de l'Olla reserve area.

At around 9:45 I leave the Racó to go to the marsh to look for where the Black-tailed godwits are feeding. Yesterday, several ornithologists commented on the presence of flocks of Black-tailed godwits in the tancat de l'Estell (Sueca), so I head straight there.

I arrive at around 10:00 at the tancat, and there are several tractors swamping, a lot of gulls (*Ichthyaetus audouinii, Ichthyaetus melanocephalus, Larus ridibundus, Larus fuscus* and *Larus michahellis*), glossy ibis (*Plegadis falcinellus*) and ruffs (*Phylomachus pugnax*).

At about 10:15 I find the flocks of Black-tailed Godwits, which are concentrated in a few fields that are muddy or recently muddy. The birds are found in fields with a central UTM (ETRS89) 732320/4352101.

In total and dispersed in several groups (usually 2 groups, although sometimes up to 4), 860 Black-tailed godwits are counted feeding in the fields. Of these, a group of 60 birds seem to arrive directly from the south, as they arrive very high, circle over the fields and then drop down where the rest of the Black-tailed godwits are feeding.



Figure 17: Impression of the fields of the tancat de l'Estell (Sueca) where the Godwits were feeding. From 10:15 to 16:30 I read godwit rings in the tancat de l'Estell, always in the same fields, although there are some muddy fields in other parts of the tancat, they are linked to these specific fields.



Figure 18: fields used by the godwits to feed in the tancat de l'Estell (Sueca).



Figure 19: Wolvegea in l'Estell.



Figure 20: Warnserpolder at l'Estell (Sueca).



Figure 21: WfG/WL[E] (Hurricane) and C1PGGW at l'Estell (Sueca).



Figure 22: Finnish godwit Y[ACR]R at l'Estell (Sueca).

Field day 4 - 17 February 2021.

I leave home (Valencia city) at 7:30. Very cloudy day with morning mist at dawn which dissipated in the first hours of daylight. Day with practically no wind and temperatures varying from 10 to 10 °C16 throughout the morning and part of the afternoon.

I go to the Racó de l'Olla Nature Reserve (8:00) where the reserve brigade (Nacho Dies, Miguel Chardí and Julián Gijón) are waiting to accompany me to read codes. After checking the reserve area, we observe a group of 93 birds, of which we can read 7 codes. After making sure that there are no more marked birds, we move to the hide at the public lagoon, where on the island in front of the public observatory, among the black-winged stilts (*Himantopus himantopus*), ruffs (*Phylomachus pugnax*), spotted redshanks (*Tringa erythropus*) and common greenshank (*Tringa nebularia*) there are about 300 Black-tailed godwits, of which we can check about 120 birds, as they leave the reserve heading south.

At 9:45, I leave the Racó de l'Olla N.R. to go to the marsh, as several groups are leaving the N.R. in the direction of El Palmar, so they are probably in the tancat de l'Estell (Sueca), as they were observed in previous days in the same area.

In the Racó de l'Olla Nature Reserve there are an estimated 400 birds in the early hours of the morning, divided between the reserve area and the public area, where we can read 13 codes.



Figure 23: Reading rings from the bunker in the Racó de l'Olla reserve area.

At around 9:45 I leave Racó de L'Olla to go to the marshes to look for where the Black-tailed godwits are feeding. Yesterday, several ornithologists commented on the presence of flocks of Black-tailed godwits in the tancat de l'Estell (Sueca), so I head straight there.

I get to the tancat around 10:00, where I meet Yanina Magggiotto, who will help me for a few hours. The whole tancat de l'Estell is already muddy, there are no tractors working. Some of the muddy fields still have a few centimetres of water and that is where we find the Black-tailed godwits.

The group we find consists of 849 birds, in which 21 ringed birds we're identified (16 RUG, 3 German and 2 unknown). UTM of the field where they feed: 731722/4352356 (ETRS89).



Figure 24: field where the Godwits were feeding in l'Estell (Sueca) on 17/02/2021.



Figure 25: Warnserpolder at l'Estell on 17/02/2021. Photo: Yanina Maggiotto.

After almost an hour of ring reading, great commotion is created by the presence of a peregrine falcon (*Falco peregrinus*) that makes a hunting strike on the flock of Black-tailed godwits, knocking one of them over the field where they were feeding. After a couple of

minutes of flapping and kicking, the Black-tailed godwit manages to recover from the falcon's blow and flies away from the site.



Figure 26: Image of the peregrine falcon after striking a Black-tailed godwit.



Figure 27: Black-tailed godwit strukken by the peregrine falcon in the tancat de l'Estell (Sueca).

The hawk's attack sends the godwits (and the other birds) into a panic and they flee in various directions and in several flocks. We try to follow the flocks as they get lost on the horizon, although most of them seem to be heading north. A large group is heading towards the tancat de Caro (Sueca) and it seems that the flock is descending on this tancat, so I head there, but the levels are too high for the Godwits. I check some areas along the way without finding any Godwits.

In front of the village of El Palmar, in the tancat de L'Establiment (Valencia) with central UTM 731437/4354492 (ETRS89), we first find a flock of 160 birds feeding in muddy fields (in this tancat they are still muddy), of which I can check about a hundred as some of them fly to a nearby field. We go to the field where there is another group of 266 birds, which we can all check for color rings as we can get very close to the flock.



Figure 28: fields where Black-tailed godwits were feeding in l'Establiment (Valencia) on 17/02/2021.

However, there are a lot of Godwits missing and I saw them flying north, so I called Nacho Dies and he told me that he had about 1,300 birds taking refuge in the Racó, roosting. I go to the Racó, to the public lagoon where Nacho tells me that they have been carrying out checks for about an hour and that they have counted 1,290 birds.

Conditions for reading codes are very difficult, as the godwits are close but to close together, with most sleeping on one leg and many with their legs in the water. Other bird species also roost among the godwits, which adds further impediments to checking. It is necessary to wait for the group to move a little to be able to see the rings, which are often incomplete as only one leg is visible. I remain in the public hide until 15:30.



Figure 29: godwit marked only with a metal ring in l'Estell (Sueca).

Field day 5 - 18 February 2021.

I leave home (Valencia city) at 7:30. Very cloudy day with high clouds that remain all day. Day with practically no wind and temperatures varying from 11 to °C17 throughout the morning and part of the afternoon.

I go to the Racó de l'Olla. After observing that there are no godwits in the reserve area, I go to the public observatory where, as soon as I enter, I see some 1,200 Black-tailed godwits that in a few seconds take flight as a common buzzard (*Buteo buteo*) passes by, leaving only 273 birds on the island in front of the observatory. All the birds were checked and 12 controls were obtained, including Wolvegea.

I leave the Racó de l'Olla N.R. at 9:30 and head for areas near the village of El Palmar. At 10:00 I find a small flock of 160 godwits in l'Establiment, but I only have time to check 45 birds before they fly away from the area.



Figure 30: field where the Godwits were fed at l'Establiment on 18/02/2021.

I go to l'Estell, where I find a small flock of only 66 birds, all of which are checked and only two RUGs are obtained.

At 11:30 I set off in search of the godwits, as around a thousand had left Racó de l'Olla early in the morning and I saw just over 200 birds feeding in the marsh.

I travel through the marshes of Sueca, Sollana, Silla, Catarroja, Massanassa, Alfafar and Valencia, visiting tancats such as El Passiego (muddy and dry), La Ratlla (flooded), El Campot (flooded), Baldoví (flooded), Zacarés (already flooded), La Foia (already flooded), Caro (flooded) or l'Estell (flooded), Càbiles (flooded), Escorredor Fondo (flooded) or the Modernista (flooded) among others and in no area do I find Black-tailed godwits.

At 14:30 I return to l'Estell, where I find a flock of 209 birds that are checked in their entirety.



Figure 31: fields where Black-tailed godwits were feeding in l'Estell on 18/02/2021.

Field day 6 - 21 February 2021.

We leave home (Valencia city) at 7:30. Very cloudy day with intermittent light rain and strong wind which made it difficult to take readings and especially to read alphanumeric code rings. Temperatures varying from 10 to 10 °C15 throughout the morning and part of the afternoon. Yanina Maggiotto accompanies me during this day.

As it is a Sunday and the Racó de L'Olla team (Nacho Dies et al.) are not working and we still do not have permission from the Natural Park to freely enter the Racó de l'Olla N.R., we decide to go directly to where yesterday groups of godwits were observed foraging in muddy fields, specifically in the tancat del Fangar (Sueca), very close to the village of El Palmar (information from María Tello, from SEO/BirdLife).

We arrive at 8:00 to the tancat del Fangar and the Godwits are not in the area, where several fields are being flooded and there are thousands of seagulls and Glossy Ibis. Not finding them there, we start to visit other tancats, being the Campot (50% muddy, tractors mudding), Baldoví (flooded), Zacarés (already muddy and dry), Estell (already muddy and dry), Establiment (already flooded, still good levels for Godwits), tancat de La Sardina (not flooded yet, low water levels), tancat de Flores (flooding in progress) and Recatí (flooding in progress).

At around 10:30 we return to the tancat del Fangar and find a single large flock of Black-tailed godwits feeding in a recently mudflatted field with UTM: 730595/4354367 (ETRS89) in which 1,726 birds are counted, including Wolvegea and Warnserpolder.

The fact that they were not seen early in the morning leads us to suppose that they were either in Racó de L'Olla or in Sant Roc and at around 9:00, as has been observed on previous days in the Racó de l'Olla Nature Reserve, they went out to the marshland fields to feed. Over time, the large flock gradually spreads over three different paddies.

Several scrambles occur, generally due to the passage of marsh harriers (*Circus aeruginosus*) and booted eagles (*Hieraaetus pennatus*), but they always return to the same fields, although there are many other apparently identical fields that they do not use.

We remain at the tancat del Fangar until 14:30 carrying out checks and when we leave the place, the Godwits are still there feeding.

On the way back home, we check the marshes of Alfafar, which have been muddy for several days now, although the tancats in the lower areas that seem to please the godwits the most, are still muddy or have not started yet (Càbiles, Escorredor Fondo, Modernista, Gambell, Buenos Aires or Villalba).



Figure 32: fields where Black-tailed godwits were feeding in the tancat del Fangar (Sueca) on 21/02/2021.



Figure 33: view of part of the Black-tailed godwitted godwit with the houses of Baldoví in the background. Photo: Yanina Maggiotto.



Figure 34: Wolvegea with a German bird feeding at the tancat del Fangar on 21/02/21. Photo: Yanina Maggiotto.

Field day 7 - 22 February 2021

I leave home (Valencia city) at 7:30. Cloudy day which clears up during the morning and moderate wind which makes the readings difficult and especially the readings of alphanumeric code rings. Temperatures varying from 11 to °C16 throughout the morning and part of the afternoon.

The Raco team was leaving the bunker in the reserve area when I arrived at Raco at 8:00 and I was told that there were no Godwits in that area, so we went straight to the public observatory where at 8:20 there were 1,133 birds remain after some 350 left Raco heading south. We carry out 15 checks (12 RUG, 1 Finnish, 1 French and 1 German), including Wolvegea once again. At 8:50 practically all the Godwits leave, heading South.

At 9:30 I arrive at the tancat del Fangar and see the arrival of some 1,500 birds perching in one of the fields where they were feeding yesterday (UTM: 730497/4354318). As I get ready to start counting and reading, a farmer arrives on a bicycle, gets off and walks along one of the fields, disturbing all the Godwits that then fly in various groups and directions. A few minutes later, in an adjoining field, a group of 466 Godwits returns, all of which are checked and 6 checks can be made (5 RUG and one Finnish).

During the commotion, I see that the bulk of the flock has headed for the tancat del Campot (Sueca), so I head there. On the way I see a small group of godwits landing on the Abadejo tancat (Sueca) UTM: 729805/4355365. It is a group of 63 birds, all of which are checked and only one check is carried out (RUG).

At 10:30 I arrive at the Campot tancat, which is being ploughed at this time, although there are still many fields to be ploughed. There I find a flock of 1,032 godwits roosting in a field that has not yet been ploughed (UTM: 729145/4355792) and with relatively high water levels, so many godwits have their legs under the water, making it very difficult to see the rings. After an hour, some of them start to move to an adjacent field to feed.



Figure 35: Semi-flooded field where some 1,000 godwits doze in El Campot.



Figure 36: fields where the Black-tailed godwits were feeding on 22/02/2021. Lower right: Tancat del Fangar. Centre: Abadejo tancat. Upper left: tancat del Campot.

While I am in the Campot, I am in contact with a local ornithologist who I met this morning in the Fangar and there he has been watching birds and taking photographs and he tells me that the godwits have not returned to the Fangar all morning.



Figure 37: field where Black-tailed godwits feed in El Campot with les cases del Senyoret in the background.

With the commotion in the Fangar, several hundred birds are missing, as there are just over 1,000 Godwits in the Campot. At about 13:30, after checking that most of the codes I am doing in the Campot are repetitive, I decide to leave the place and try to look for those hundreds of Godwits that are missing, checking the best areas such as El Recatí, L'Establiment, del Rei or L'Illa, but no Godwits can be seen.

Yesterday the marshes of Alfafar were checked and many tancats have already been ploughed and many others are been ploughed, so I decide to go there to see if there is any flock. Although they are already ploughing great parts of the tancats of Alfafar, those that usually are more to the liking of the Godwits, like Càbiles, Escorredor Fondo, Gambell or Modernista are ready to be ploughed or ploughing has just started. Possibly in 1-2 days, the Godwits will be here. At 15:00 I leave the Alfafar marshes without seeing any godwits.

Field day 8 - 23 February 2021

I leave home (Valencia city) at 7:30. Sunrise is clear, although it gradually becomes cloudy during the morning. Light wind. Temperatures varying from 12 to °C17 throughout the morning and part of the afternoon.

The day before, I arranged with Nacho and Miguel, from the Racó team, that I would go directly to the public lagoon, which is where the godwits are usually found every morning, and they would look at the reserve area. When I arrive at the public observatory at 8:00, there are about 1,300 Godwits roosting on the island in front of the observatory, while Nacho tells me that they have another 500 in the reserve area, so Nacho and Miguel stay in the bunker in the reserve area, while I stay in the public observatory.

At 8:30 the great majority of the godwits present in the public lagoon leave the lagoon and it seems that part of them enter the reserve area, as Nacho tells me that there are about 1,000, so I decide to go to read rings in the bunker, but before I arrive almost all the godwits leave the reserve to go to the marshes.



Figure 38: Views of the public lagoon from the observatory.

In the public lagoon I read 12 colour ring codes (8 RUG, one German, one French and two Finnish), while Nacho and Miguel carry out 11 in the reserve zone (10 RUG, one German and one Finnish).

At 8:50 I leave the Racó and after checking several tancats on the way, I head for Campot (Sueca), where at 9:35 I find up to 1,380 godwits sleeping in the same field where they slept

yesterday. A few minutes after arriving and after counting them, a marsh harrier makes them all fly and leave the Campot tancat (9:50), without giving me time to make any readings. I see that they are heading towards the SouthWest and I lose them on the horizon. After waiting about 15 minutes in case they return to the Campot after the commotion, I decide to look for them.

Optimal areas are checked, tancats with adequate levels and/or which are becoming muddy, such as the tancat de Xato, Noira, Fangar, Miragall or Establiment. In the tancat de la Sardina I find a group of about 350 godwits feeding (UTM: 730738/4352503), but even before I reach their position, they fly away. Finally I find the godwits at Tancat de Flores, 1,713 birds, all in a single field (UTM: 731426/4351936), where most of them were sleeping. Here we spot Wolvegea and Warnserpolder.



Figure 39: semi-flooded field where 1,713 Godwits are sleeping in the tancat de Flores (Sueca).



Figure 40: fields where Black-tailed godwits rest and feed in the tancat de Flores (Sueca).



Figure 41: fields where Black-tailed godwits rest and feed in the tancat of La Sardina (upper left) and in the tancat of Flores (lower right).

The tancat of Noira, located between the tancat of La Sardina and the tancat of Flores, is being ploughed, just like the two tancats where the Godwits can be seen, but no groups of Godwits are to be found here.



Figure 42: Warnserpolder in the Flores tancat on 23/02/2021.

I stay at the Flores tancat from 11:00 to 14:00, carrying out checks. The Godwits change fields after several flights, but always in nearby fields and sometimes they are located in distant places with strong backlighting that makes it practically impossible to read the rings.

After leaving the southern marshes, I head for the northern marshes, in this case Alfafar, which has good levels and is muddy at the moment, but no Godwits can be seen.

Field day 9 - 25 February 2021

I leave home (Valencia city) at 7:30. Dense fog with high clouds most of the morning, no wind. Temperatures varying from 11 to °C18 throughout the morning and part of the afternoon.

I go directly to the public area, while Nacho and Miguel look at the reserve area. When I arrive at the public observatory at 8:00, there are only 180 godwits roosting on the island in front of the observatory, while Nacho tells me that there are no godwits in the reserve area. At 8:20 more than 2,000 godwits arrive flying directly from Sant Roc (Nacho Dies observes the arrival of the flocks from there) and land in front of the public observatory. A total of 2,300 godwits are counted roosting in the Racó.

After the three of us had been carrying out checks in the public area, there was a commotion and I moved to the reserve area at 10:00 where there were 510 birds. After carrying out 14 checks, 7 of them had been carried out in the public area an hour earlier, so clearly these were birds that were present in the public area first thing in the morning.



Figure 43: Black-tailed godwit churn in the public area of the Racó.

At 11:00 a.m. there have been several stirrings and the Racó de L'Olla there are still about 1,500 godwits, so 800 godwits seem to have gone to the marsh to feed.

Readings in the Raco are complicated by the level of water that covers the legs of most of the birds; by how tightly they are packed together and; by the fact that they are roosting and therefore resting on only one leg, which makes it impossible to read the whole code.

I drive around the southern marshes that are being ploughed, have just ploughed in the last few days or simply have good water levels for the Godwits. I visit the tancats of El Campot

(recently ploughed), Baldoví (still high waterlevels), la Barraca (being ploughed), Miragall (being ploughed), La Sardina (being ploughed), Xato (being ploughed), Noira (recently recently ploughed) and Flores (recently ploughed).

After not observing them in the southern marshes, I move to the northern marshes (Alfafar) and check the tancats of Càbiles, Escorredor Fondo, Gambell, Buenos Aires and Modernista, which were either being ploughed or had just been ploughed. Only a small flock of 58 Black-tailed godwits (UTM: 729617/4360030) was found in the Escorredor Fondo tancat, none of which were ringed.



Figure 44: field where Black-tailed godwits feed in the tancat de l'Escorredor Fondo (Alfafar).

At 13:15 I return to Racó de l'Olla as I have not seen the godwits in the marshes and indeed, when I reach the public area of the Racó (Nacho Dies informs me that there are none in the reserve), there are 2,300 godwits roosting on the island in front. It seems that those 800 that left Racó de L'Olla mid-morning ended up coming back.

I stay until 15:00 at Racó de L'Olla reading colour rings when the birds move a little or there is a flutter. At 14:40 there is a stir and at 14:50 Pablo Vera, a local ornithologist working for SEO/BirdLife, informs me that about 300 godwits have just landed on the tancat del Xato (Sueca) with UTM: 729648/4353398 and are feeding. This tancat had been checked midmorning and the godwits were not there yet.



Figure 45: field where Black-tailed godwits feed in the tancat del Xato (Sueca).

About 2,000 Godwits are still in Raco de L'Olla when I leave at 15:00, so the bulk of the Godwits have not left the Raco de L'Olla all morning.



Figure 46: appearance of the Xato tancat when it is checked mid-morning, with thousands of seagulls and moorhens feeding while the fields are being muddied.

Field day 10 - 26 February 2021

I leave home (Valencia city) at 7:30. In the early hours of the morning there is a dense fog of high clouds, no wind. Temperatures varying from 12 to °C17 throughout the morning and part of the afternoon. During part of the day I am accompanied by Yanina Maggiotto.

I go directly to the public area, while Nacho and Miguel look at the reserve area. When I arrive at the public observatory at 8:00, there are 1,970 Godwits roosting on the island in front of the observatory, while Nacho tells me that in the reserve area there are 268 Godwits, which gives a very similar number to the one obtained the previous day, approximately 2,300 Godwits. When Nacho and Miguel finish in the reserve area, they go to the public observatory to read rings with me.

Readings in the Racó are complicated by the level of water that covers the legs of most of the birds, by the tightly packed birds that cover each other and by the fact that they are roosting and therefore leaning on only one leg, which makes it impossible to read the whole code, so that few controls are obtained for the hours invested.

At around 11:00, still knowing that the 2,300 Godwits are still in the Racó, Yanina and I go out to the marsh in case there are any birds feeding. We visit Tancat del Xato (still being ploughed), El Campot (ploughed), Baldoví (still not ploughed), La Barraca (ploughed), El Fangar (already plougghed but with good levels), Miragall and Sardina (ploughed) and Noira and Flores (already ploughed and no water). We don't see any godwits.

After examining the southern marsh, Yanina leaves for work and I move to the northern marsh (Alfafar) where the ploughing activities have practically finished although several tancats maintain optimum levels for the Godwits, but none are observed, unlike in previous years when large flocks are observed in the tancat de l'Escorredor Fondo, Càbiles or Gambell.



Figure 47: The tancat de Càbiles (Alfafar) on 26 February with optimum levels for Black-tailed godwit.

At around 14:00, Nacho tells me that all the Godwits are still in the Racó and that after returning to the public observatory they have not carried out any new control, so I don't see much sense in returning to the Racó to observe the same flock roosting and not obtaining practically any new control compared to those obtained earlier in the morning, so I decide to return home.

It seems clear that the godwits are feeding at night and resting during the day, remaining in the Racó de l'Olla National Park.

Field day 11 - 01 March 2021

I leave home (Valencia city) at 7:30. In the early hours of the morning there is dense fog with high clouds, no wind. Temperatures varying from 10°C to 10°C16 throughout the morning and part of the afternoon. During part of the day I am accompanied by Yanina Maggiotto.

We go directly to the public area, while Nacho Dies and Miguel Chardi look at the reserve area. When we arrive at the public observatory at 8:00, there are only 124 godwits roosting on the island in front of the observatory, while Nacho Dies tells me that in the reserve area there are more than 1,400 godwits (1,378 in front of the bunker and another 80 in the Saladar, on an island within the reserve that is not visible from any observatory), which gives a number (1,582) significantly lower than the number obtained the previous Friday, with approximately 2,300 godwits. At the public lagoon, Yani and I checked the total number of birds as, being few in number, they are all on the island and their feet are visible. Of the 124 godwits, there are three marked ones (2 RUG and one Finnish). At about 8:50 we go to the reserve area to continue ring reading from the bunker.

The readings in the Racó are complicated by the level of water covering the legs of most of the birds, by the tightly packed birds that cover each other and by the fact that they are roosting and therefore resting on one leg only, which makes it impossible to read the whole code, so that few controls are obtained for the hours spent. This was the case in the reserve area, with many birds and little space on the islands, so many birds were with their feet in the water.

30 codes are read in the reserve area, including the three birds we saw in the public area earlier in the morning. Of the 30 codes read, 26 are RUG (including Wolvegea), one French, one German, one English and one Finnish. Not all Godwits are checked as many are in the water.

At about 11:30, I go out to the marsh to look for godwits, as it is possible that those 800 birds that are missing from last Friday's census are either in the marshes feeding or have taken their route to the north and have left l'Albufera. The south, west, north and northeast marshes are visited.

In the south, tancats are visited which, although they have been ploughed quite some time ago, some fields still have good levels of water to feed Godwits. These tancats are: Fangar, Barraca, Baldoví, Campot, Paredes, Xato, Sardina, Miragall, Noira and Flores.



Figure 48: Appearance of the tancat del Xato (Sueca) on 01 March with optimum levels for Black-tailed godwit.

In the west all the tancats have been plougghed days or even weeks ago and are all dry except for two tancats, La Foia (Sollana) and La Ratlla (Silla), which were being plougghed today and there were thousands of birds feeding there, among them more than a hundred ruffs (*Calidris pugnax*), so this area seems suitable for waders to feed.

Traditionally, the last marshes to hold water are those with the lowest levels, these being those of Catarroja and Silla, which normally hold water until the first week of March or even part of the second week. Until a few years ago, it was normal for them to still hold water until 15th March. Today, both marshes were surveyed and they are ploughed and dry on the first of March, something that has never happened before.

On the way back, the northern marshes (Alfafar) were inspected, where the ploughing have finished, although several tancats maintain optimum levels for the godwits, but none were observed, unlike in previous years when large flocks were observed in the tancat de l'Escorredor Fondo, Càbiles or Gambell. It is also observed that the small portion of marshland located to the northeast of l'Albufera lake, the tancat del Pomero, is currently being ploughed and is home to a large number of birds (mainly dunnocks, gulls and herons), but this tancat is located next to the CV500 road with constant traffic and is not a usual feeding place for Black-tailed godwits or waders in general.



Figure 49: Appearance of the tancat de La Foia (Sollana) on 01 March with optimum levels for Black-tailed godwit.

It seems clear that the godwits are feeding at night and resting during the day, remaining in the Racó de l'Olla National Park.

Field day 12 - 03 March 2021

I leave home (Valencia city) at 7:30. Throughout the day there is dense fog with high clouds, no wind. Temperatures varying from 10 °C to 10 °C18 throughout the morning and part of the afternoon.

I go directly to the public area of Raco de L'Olla, while Nacho and Miguel look at the reserve area. When I arrive at the public observatory at 8:00, there are only 203 godwits roosting on the island in front of the observatory, while Nacho tells me that in the reserve area there are 1,350 godwits. In the public lagoon I check all the birds, as there are few of them, they are all on the island and their legs are visible. Of the 203 godwits, there are four marked (4 RUG), one of them a Lime flag with a code that I can't read due to discolouration. At about 8:40 I go to the reserve area to continue reading the rings from the bunker.

The readings in Racó de L'Olla are complicated by the level of water covering the legs of most of the birds; by the tightly packed birds that cover each other and; by the fact that they are roosting and therefore resting on one leg only, which makes it impossible to read the whole code, so that few controls are obtained for the hours spent. This was the case in the reserve area, with many birds and little space on the islands, so many birds stood with their feet in the water.

21 codes were read in the reserve area, not including the three birds I saw in the public area earlier in the morning. Of the 21 codes, 16 are from the RUG scheme (including Wolvegea), two German, one English (Hurricane) and two Finnish. Not all Godwits are checked as many are in the water.

At around 11:000, I go out to the marsh to look for Godwits, even though the more than 1,500 Black-tailed godwits are still roosting in Racó de L'Olla without much intention of foraging. The west, north and northeast marshes are visited.

In the west, all the tancats have been plouged days or even weeks ago and are all dry except for two tancats, La Foia (Sollana) and La Ratlla (Silla), which until yesterday were being ploughed and today have fields suitable for foraging. A small group of 8 Black-tailed godwits can be seen, none of which are ringed. Today there were also thousands of birds feeding there, among them more than a hundred ruffs, so this area seems to be suitable for waders to feed.



Figure 50: The tancat de la Foia (Sollana) on 03 March with optimum levels for Black-tailed godwit.

The northern marshes (Alfafar and Massanassa) are also being inspected. In Alfafar, the ploughing ended a few days ago, although several tancats maintain optimum levels for the godwits, but none have been observed. Yesterday at around 14:00 a small flock of godwits was observed feeding in the tancat de l'Escorredor Fondo, exactly in the same field where I observed a small group of birds feeding on 25/02. Several tancats in the Alfafar marsh still have fields with good water levels, such as Càbiles, Gambell, Buenos Aires and Modernista, but they are barely home to gulls that are feeding.

The Massanassa marsh, which is being partly drained today, is also being checked. Its lower part, the tancat de Burriel, still maintains high levels of flooding although it is already being emptied for its imminent flooding.



Figure 51: Appearance of the Massanassa marsh on 03 March with optimum levels for Black-tailed godwit.

Yesterday I received notice that possibly (the observer was not entirely sure) a flock of godwits might be seen feeding in the Massanassa marsh at around 15:00, so I decide to stay in this marsh, where thousands of birds (gulls, little egrets and herons) feed, in case the Racó godwits decide to go out to feed around that time, but I stay there until 16:00 and no godwits are seen.

The Pomero tancat, although the mudflats ended yesterday, is still at optimum levels and there are a large number of birds (gulls, little ducks and herons) feeding there, but no species of waders can be seen.

It seems clear that the godwits continue to feed at night and rest during the day, remaining in the Racó de l'Olla National Park.

Appendix B Area Maps

Source: Ajuntament de Valencia i L'Academia Valenciana de Llengua, Mapa toponimic dels tancats de l'Albufera, edicion diciembre de 2013



Map of the northern areas visited during the expedition



Map of the south-eastern areas visited during the expedition



Map of the southern areas visited during the expedition

Appendix C Literature

Gosney, D. 2011. Finding birds in Morocco: coast and mountains. Sheffield: Easybirder. Groen, N.M., Kentie, R., Goeij, P. de, Verheijen, B., Hooijmeijer, J.C.E.W., Piersma, T.. 2012. A modern landscape ecology of Black-tailed godwits: habitat selection in Southwest Friesland, The Netherlands. Ardea 100:19-28.

Hooijmeijer, J. C. E. W., Senner, N. R., Tibbitts, T. L., Gill, R. E. Jr, Douglas, D. C., Bruinzeel, L. W., Piersma, T.. 2013. Post- breeding migration of Dutch- breeding black- tailed godwits: Timing, routes, use of stopovers, and nonbreeding destinations. Ardea, 101, 141–152.

Howison, R.A., Hooijmeijer, J.C.E.W., Verhoeven, M.A., Loonstra, A.H.J., Olff, H., Piersma, T. in prep. European godwits rely on disappearing types of wetland and are effective sentinels of land-use change in the Sahel. *Target journal: Nature Ecology and Evolution*

Kentie, R., Senner, N. R., Hooijmeijer, J. C. E. W., Márquez-Ferrando, R., Masero, J. A., Verhoeven, M. A., Piersma, T.. 2016. Estimating the size of the Dutch breeding population of Continental Black-tailed Godwits from 2007–2015 using resighting data from spring staging sites. Ardea, 104, 213–225. https://doi.org/10.5253/arde.v104i3.a7

Márquez-Ferrando, R. Hooijmeijer, J. Groen, N. Piersma, T. Figuerola, J.. 2011. Could Doñana, SW Spain, be an important wintering area for continental Black-tailed Godwits *Limosa limosa limosa*? Wader Study Group Bulletin 118: 82-86.

Mulder, T. De Grutto in Nederland. 1972. Wetenschappelijke mededelingen van de Koninklijke Nederlandse Natuurhistorische Vereniging. Nr.90. Hoogwoud: KNNV.

Newton, I. 2004. The recent declines of farmland bird populations in Britain: an appraisal of causal factors and conservation actions. Ibis 146: 579-600.

Roodbergen, M., van der Werf, B. & Hötker, H. 2012. Revealing the contributions of reproduction and survival to the Europe-wide decline in meadow birds: review and meta-analysis. Journal of Ornithology 153: 53-74.

Teunissen, W., Schotman., A., Bruinzeel, L.W., Holt, H. ten., Oosterveld, E., Sierdsma, H., Wymenga, E., Melman, D.,. 2012. Op naar kerngebieden voor weidevogels in Nederland. Feanwâlden: Sovon-rapport 2012/21, A&W rapport-1799, Alterra-rapport 2344.

Teunissen, W. & Soldaat, L. 2006. Recente aantalsontwikkeling van weidevogels in Nederland. De Levende Natuur 107: 70-74.

Thijsse, J.P.. 1904. Het Vogeljaar, Nederlandse vogels in hun leven geschetst. Amsterdam: W. Versluys.

Thorup, O.. 2006. Breeding waders in Europe2000. International Wader Study Group 14.

Tscharntke T., Klein A. M., Kruess A., Steffan-Dewenter I., & Thies C. 2005. Landscape perspectives on agricultural intensification and biodiversity - ecosystem service management. Ecology Letters 8: 857-874.

Verhoeven, M.A., Loonstra, A.H.J., Hooijmeijer, J.C.E.W., Masero, J.A., Piersma, T., Senner, N.R. 2018. Generational shift in spring staging site use by a long-distance migratory bird. Biology letters 14(2): 20170663.

Verstrael, T.J.. 1987. Weidevogelonderzoek in Nederland. 's-Gravenhage: Contactcommissie Weidevogelonderzoek.

Vickery, J.A., Tallowin, J.R., Feber, R.E., Asteraki E.J., Atkinson, P.W., Fuller, R.J., Brown, V.K. 2001. The management of lowland neutral grasslands in Britian: effects of agricultural practices on birds and their food resources. J. Appl. Ecol.: 38: 647-664.