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# Describing habitat and finding colour rings of Black-tailed Godwits (*Limosa limosa*) Southern Portugal and Spain, 3-10 February 2017

Expedition report, University of Groningen & Global Flyway Network, The Netherlands

Jos Hooijmeijer, Ruth Howison & Theunis Piersma



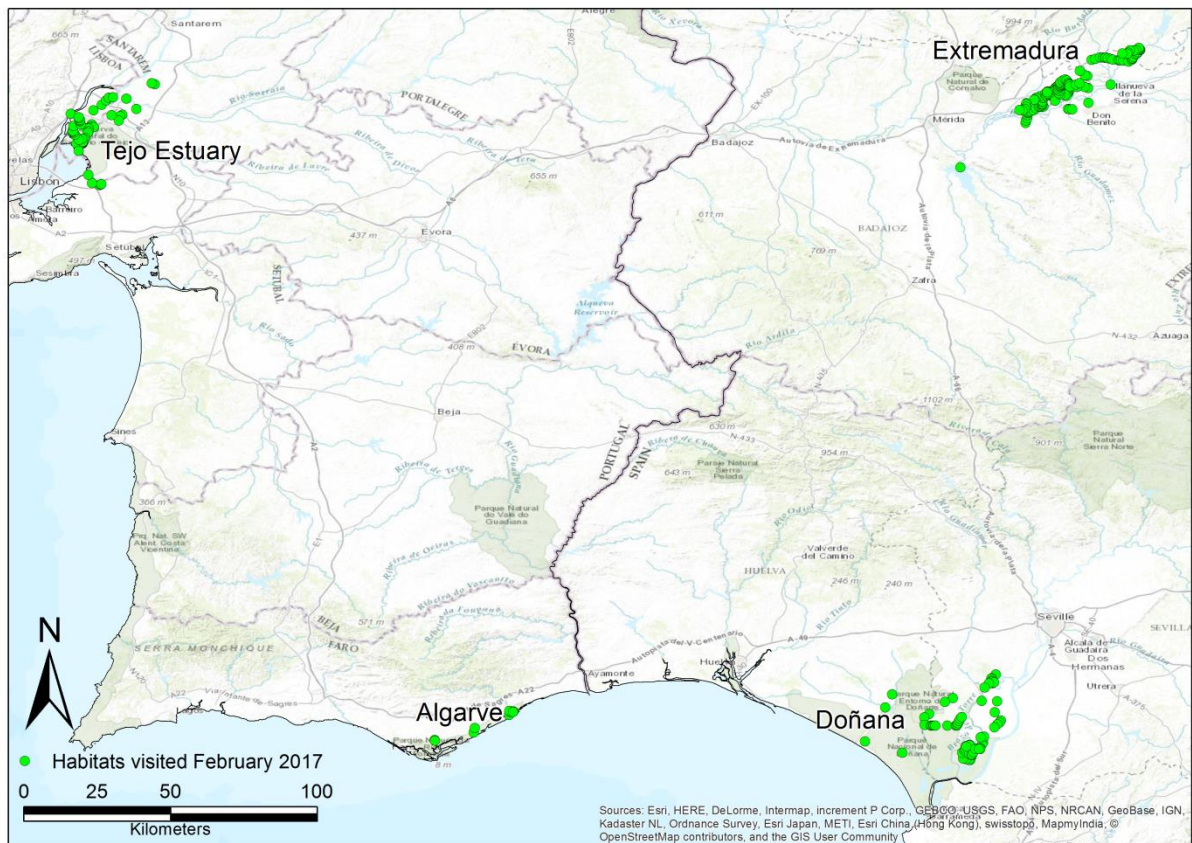
## **Introduction**

### **Habitat study**

Anthropogenic alteration of natural wetlands is having a major impact worldwide with consequences (both negative and positive) for migratory species such as continental black-tailed godwits. The majority of continental black-tailed godwits breed in grassland meadows situated in north-west and Eastern Europe (March – July) after which they migrate southwards for the non-breeding period (mid July – February), finding forage resources within wetlands and agricultural rice fields. On their migratory route black-tailed godwits pass through France and either stage or spend the non-breeding period in southern Spain and Portugal. Many will make the Saharan crossing to overwintering sites in West Africa, namely; the Senegal Delta and coastal region of Senegal, The Gambia, Guinea-Bissau, Guinea, Sierra Leone and central Mali.

The black-tailed godwit staging areas within Portugal and Spain are important both on the autumn south- and spring northbound migrations. Much of the natural floodplains in these areas have been converted to agricultural land use. These areas are managed differently in terms of parcel sizes, water- and land management and the amounts of herbicides, pesticides and fertilizer inputs permitted. In this study we aim to visit as many areas previously and currently visited by black-tailed godwits and classify land parcels according to the land use and management types i.e. rice fields, other agricultural crops, wet grasslands used for livestock grazing, natural or recovering wetlands, salt marshes, salt pans and lakes. These data will be combined with remote sensing data to analyze land use changes and compare environmental conditions experienced by staging godwits, linking to stability or changes in godwit distributions over time.

Between 3-10 February 2017 we visited the most important areas in southern Portugal and Spain to record resightings of individual birds and describe godwit habitat. In this report we present a daily overview of our findings with photos, locations we visited, numbers present and the first conclusions and recommendations.



Overview of the habitats that were visited in southern Portugal and Spain, during the fieldwork expedition 3-10 February 2017

## Daily reports

### 3 February 2017

We left Amsterdam 1 hour late but arrived in Lisbon, Portugal around 16h00 without any further problems. We picked up the car and took a small detour around the Tejo Estuary to Barroca de Alva. They had just started ploughing the ricefields. After that we went to Hortas near Alcochete where we arrived when the water was at low tide. We did not encounter any godwits, but 1000's of avocets, a few spoonbills and dunlins wading in the shallow water. It looked like there had been a lot of rain recently since most agricultural fields were about 10cm deep under water or many shallow pools of water were present. We sampled a few different habitats, rice fields with standing stubble from the previous harvest, recently ploughed rice fields and wet grasslands with short grazed grasses and patches of *Juncus effusus*. Stands of 2m tall *Phragmites australis* were present along the borders of ditches and abandoned agricultural fields. Along the edges of the estuary were equally large areas covered by *Juncus* and *Phragmites*, short vegetation was dominated by grasses and succulents. We slept in an apartment in Vila Franca de Xira, where we met our colleagues Ysbrand Galama and Gjerryt Hoekstra, who are here to collect resightings and colour ring density samples.



Livestock grazed landscape with tall Juncus patches, Barroca de Alva



Standing rice stubble, Barroca de Alva

#### **4 February 2017, 90% clouded and raining on and off until late afternoon**

In the morning we went straight for the best area to find godwits, the rice fields of Giganta and Ponta da Erva. But first we had to pick up a keycard for the main gates at the office of the agricultural company Associação de Beneficiários da Lezíria Grande de Vila Franca de Xira that manages the area around the road between Porto Alto and Vila Franca. There we met Rui Paixão who keeps record of all wildlife in this area and tries to keep the delicate equilibrium between farmers, hunters and birdwatchers. He told us the surface used for rice cultivation is still increasing. It is an important product for the Portuguese economy but it would not be very profitable if not subsidized by the European Union. The increase in rice fields is attracting more and more birds. The increase in godwit numbers in the past years is probably due to a combination of several factors: more rice fields, at close range to the traditional roost in the Tejo estuary, no hunting and no use of

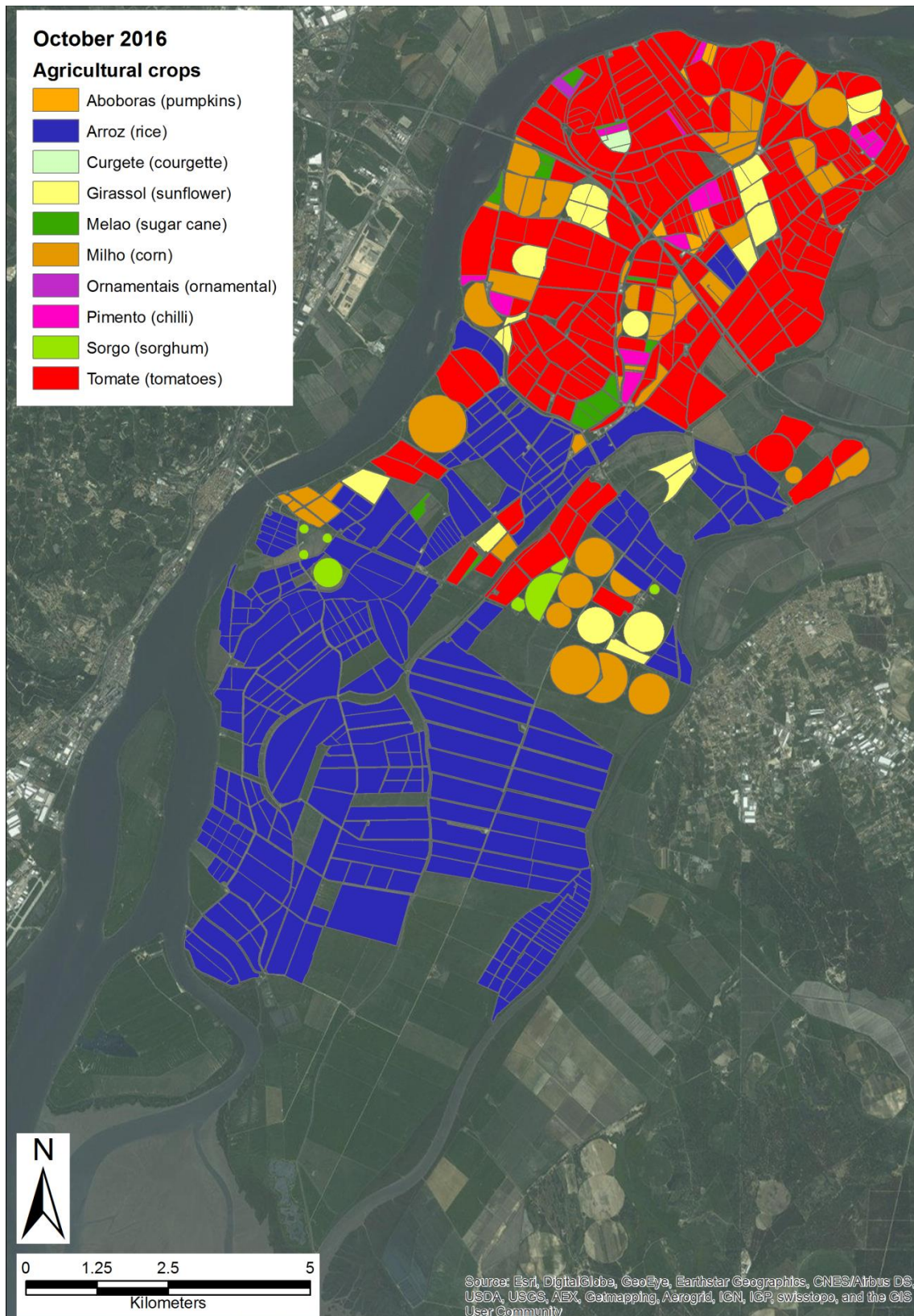
pesticides because the rice is used in baby food. Perhaps it is a coincidence but birds seem to prefer those fields that are sprayed less. Not only godwits have increased but also flamingo's and storks. The flamingos are becoming a problem since they can ruin newly sown rice fields when they are foraging. The same goes for storks that trample rice plants when they are hunting for (imported) crustaceans in September/ October just before the rice harvest. The company has a special damage control team that in some parts of the year run a 24/7 schedule to scare birds from vulnerable places. It was time to go to the field and although the weather was poor, we enjoyed several big flocks of in total at least 25.000 godwits and read almost 60 different colour ring combinations of a variety of ringing schemes. In this area most parcels were already ploughed and due to the heavy rains in the past 2 weeks, were submerged under about 10cm of water, offering plenty foraging opportunities to godwits. Foraging efficiency measures were taken by observing the intake rate of different individual godwits for 1 minute, we observed an intake rate of  $15 \pm 3$  food items.min<sup>-1</sup> (N=16). The southern part of this area is dominated by grasslands grazed by horses and cattle. We did not see any godwits in these grasslands nor in the part on the north of the road that is dominated by other crops than rice or grass. We continued north towards the rice fields of Salvaterra de Magos (many stubble fields, hardly any ploughing), Benavente/ Paul de Trejito (stubble), Santo Estavao (nice wet ploughed fields), Samora Correia (only stubble) but did not manage to find a single godwit. Soils in Giganta are mostly heavy clays while soils in the north contain much more sand. We stayed again in Vila Franca for the night.



The rice fields of Giganta hosting 25000 godwits



The rice fields of Giganta



Current agricultural land use in Giganta, Portugal (source: Rui Paixão, Associação de Beneficiários da Lezíria Grande de Vila Franca de Xira)

**5 February 2017, sunny, 19 C**

On this spring day we left the Tejo estuary and continued our tour to the Algarve where we looked for godwits in the salt pans of Olhão, Fuseta, Santa Luzia and Tavira. We only found a flock of 330



birds in the Olhão salt pans that were foraging, apparently on Chironomids. The ring density was low with 1 only one ringed bird on almost 200 birds checked so perhaps there were many *Islandica*'s in this flock. The salt pans that we visited mostly contained a shallow layer of water 5-15cm deep and were free of vegetation making for an ideal habitat for godwits to forage or rest with plenty of opportunity to view potential dangers. Foraging efficiency measures were taken and we measured an intake rate of  $19 \pm 2$  food items.min<sup>-1</sup> (N=5). In Tavira we encountered abandoned salt pans that were recovering with salt marsh vegetation. We drove into Spain and spent the night in NP Doñana in a house close in the reserve to El Palacio near Matalascañas.



Olhão salt pans

**6 February 2017, sunny, 15 C, no wind**

At first light we checked the marshlands opposite El Palacio. The marshlands were completely flooded and we saw many birds including ibises, ducks, herons and storks but no godwits. So we left this scenic place and drove to El Rocio. In the marshland opposite the village there was a flock of about 250 birds foraging on most likely Chironomids. But they were quite distant, up to their belly in the water and with poor light conditions. We managed to check at least half of the birds but could finish two 2 ringed individuals. Foraging efficiency measures were taken at around 11h00 and we measured an intake rate of  $19 \pm 3$  food items.min<sup>-1</sup> (N=8). We left for Isla Mayor via the road past the visitor centre JA Valverde. We passed through vast areas of citrus orchards, olive plantations and plastic tunnel farms mainly growing strawberries. Huge stretches of land have been modified for agriculture in this area.

It was fantastic to see how flooded the marshlands were between the visitor centre and Huerta Tejada. The Lucio de Lobo was a huge lake we saw many ducks and flamingos but no godwits. Later in Isla Mayor we met Rocio Marquez of the EBD and she explained that it has been raining quite a bit this winter but even more important is that more water from the Guadiamar River now streams into

the Doñana marshlands again, like in the past before the disaster with the pollution of the mine upstream. We caught up and after that continued to Veta la Palma fish farm complex. The rice fields were ploughed and flooded with up to 5cm of water. We noted that sections of what were salt marshes in the last 2 years had been drained and converted to “natural” cereal, Roccio mentioned that they were trying to establish quinoa crops since the rice crops had failed due to the high levels of salt, therefore there is a trend to try different agricultural crops in the area in addition to fish farming.

In Veta la Palma we found at least 15000 godwits, mainly in the Lucio Cuquero Grande. The birds were quite skittish and first we did not manage to read many rings but finally we went home with 10 resightings. Foraging efficiency measures were taken (this was late evening 17h40) and we measured an intake rate of  $14 \pm 2$  food items.min<sup>-1</sup> (N=6). This night we slept at Canada de los Pajaros outside Puebla del Rio.



The marshland opposite the village, El Rocio



Veta la Palma, Lucio Cuquero Grande, with approximately 15000 godwits

**7 February 2017, sunny, 18 C, no wind, clouded in the evening**

We met Rocio in the morning and were by 8:45 in Veta la Palma to find the birds again in Lucio Cuquero Grande. A big flock was foraging close to the edge, probably on chironomids. Unfortunately it was a bit foggy making ring reading difficult. But after 45 minutes the fog lifted and we had a good session of ring reading before they all went to sleep around 10:30 mostly on one leg. A marsh harrier passing over just made them sit further away in deeper water and we had to stop around eleven. But with 19 birds of our scheme and another 6 for other schemes it was not too bad. Foraging efficiency measures were taken from 9:00 until 10:30 and we measured an intake rate of  $18 \pm 6$  food items.min<sup>-1</sup> (N=11), towards 10:30 it was clear that the group were settling down to rest and their behaviour started to alter between foraging, preening and sleeping. We tried to find more godwits in other parts of Veta la Palma but unfortunately we only found a group of 1000 birds in deep water and a handful of other birds. But we did run into a nice flock of 75 Spoonbills that, for a change, did not fly off immediately. We scored 11 colour rings in this group of different schemes; what an incredible ring density! We left Veta la Palma around 14:15 for a lunch meeting with Jordi Figuerola, senior researcher at the EBD, to catch up about the latest news and exchange research results and future work. After that we explored the rice fields of Isla Menor and Dehesa de Abajo but found no godwits. The water level at Dehesa de Abajo was clearly too high for waders. But we took some good data points for the research on habitat selection.



Godwits intently foraging in the early morning, Lucio Cuquero Grande, Veta la Palma

**8 February 2017, 14 C, sunny, no wind**

In the early morning we went straight for Veta la Palma to have a good ring reading session before leaving to Extremadura. But when we arrived at 9:00 all birds were already asleep in Cuquero Grande. Unlike yesterday none of the godwits were foraging on the shallow eastern shore within good ringreading distance. So we decided to scan the sleeping birds and were not unhappy with 12 ringed birds including 2 codeflags and 2 (Holwerd and Wolwega) out of 5 transmitter-birds that we could see, from the movement updates, were in the lake. Before we left we counted the flock and estimated that about 13000 birds were present.

We left in the beginning of the afternoon and arrived in Extremadura around 16:00. We scanned the area around Yelbes thoroughly, found no godwits but took a lot of data points for the habitat analysis. We continued our search east of Santa Amalia and finally ran into the other team consisting of Egbert van der Velde and Wiebe Kaspersma that just found the night time roost. We made a coarse estimate that 2500 birds were present at the roost. We heard from them that the team of Jose Masero and Auxi Villegas of the University of Extremadura (Badajoz) would try to catch godwits tonight so we joined them. They were trying to catch birds for an experiment to establish differences in fat accumulation depending on the diet (rice or animal prey). Unfortunately they only caught 1 bird in the first round of mistnetting and after that we left to spend the night in Santa Amalia.

We noticed a different agricultural management system in Extremadura compared to both Portugal and Doñana. In Extremadura agricultural parcels are comparatively smaller and rice agriculture is one of many crop alternatives. Parcels were managed in a mosaic of cereal, maize, olives, wine grapes and orchards of fruit (mainly apples). In addition an annual grass species (much like *Poa annua*) had established on parcels that had been harvested before winter. Farmers were spraying large quantities of herbicides on these parcels resulting parcels covered in dead yellow grass and no visible activity by any bird species.



Jose Masero ringing and measuring the 1<sup>st</sup> godwit caught for the evening, near Santa Amalia

### **9 February 2017, watery sun, 12C**

On this day we tried to cover large parts of the Extremadura rice fields to take habitat data-points and to find godwits. We started off in the area between Santa Amalia, Hernan Cortes and Medellin. Near Hernan Cortes we found two groups of 420 and 1225 birds, including the famous transmitter-bird Amalia! Most of them were foraging on freshly ploughed rice fields with a lot of water on them, and could be approached quite well. Foraging efficiency measures were taken from 11h00 – 12h30 and we measured an intake rate of  $9 \pm 5$  food items.min<sup>-1</sup> ( $N=16$ ). Foraging in the rice fields seems to result in a slower intake rate than in areas where the godwits are foraging primarily on chironomids, since the godwits spend much more time probing the substrate to find food items. Food items seem to be unevenly distributed where some individuals only find a few food items and others find many resulting in the wide reward range between individuals.

In the afternoon we continued our search in the rice fields of Rucas, Vivares, Alcollarin and Palazuelo. Especially in the last area there was a lot of suitable, wet and freshly ploughed habitat available but we did not find a single godwit; in the past we have seen many birds in this area. We decided to finish the day near Santa Amalia where we found a nice group of 2550 godwits at close range. But after 10 minutes a large tractor scared the birds and the whole flock eventually flew away. We heard many gun shots in the area during the whole day and probably also explains why the godwits were nervous, flying away at the slightest provocation.

We finished the day cleaning the car...

Tomorrow we will drive back to Lisbon to catch our flight back home. Even though the main goal of our mission was not to read as many colour rings as possible, we were quite happy with 148 resightings (114 of 108 individuals of our own scheme and 34 from other schemes) and 15 Spoonbill-combinations. The Bird-Ring app was a great help to get the data in the database!



Godwits foraging in rice fields near Hernan Cortes



We found Amalia!

## Conclusion

In Portugal, within the Giganta area, it was the general opinion of the people that we spoke to that the beginning of January was quite dry followed by heavy rains in late January, connected to a cyclone system present in the Atlantic. Indeed during our stay in Portugal it rained on and off all day. The result of all the rainfall was that all of the clay rich agricultural parcels were either flooded under 5-10cm of water or all the shallow dips in the parcels were filled with water. In addition the soil was completely saturated. A large majority of the rice parcels were ploughed, while a few remained as standing stubble left over from the previous harvest. This made for an unlimited, ideal foraging and resting landscape for godwits. We encountered a large flock of 25000 godwits here. We learned from Rui Paixão that the rice harvested from this area is used to produce baby food and therefore no herbicides or pesticides are used. Godwits were readily probing and foraging in the area with consistent efficiency between individuals. Likely, the absence of pesticides increases the availability of invertebrates, providing a rich food source to godwits in addition to rice kernels.

Moving along the southern coast between Portugal and Spain, namely Olhão, Fuseta, Santa Luzia and Tavira, we encountered godwits foraging on chironomids or resting in many saltpans, seeming to prefer salt pans with a water layer of 5-10cm.

Large scale landscape conversion to agriculture has occurred in the floodplains of Doñana, agricultural parcels are very large covering several hectares each. In the higher elevation areas citrus, olives and strawberries (cultivated in expansive plastic tunnels) are popular choices. There is little remaining of the natural Mediterranean scrub and step vegetation, save for the Doñana reserve. In the lower lying regions rice agriculture is dominant, although it was interesting to learn from Rocio Marquez that there is a trend for further conversion of salt-marsh parcels for the production of “natural” cereals such as quinoa. Again the majority of the rice parcels were ploughed and flooded either completely or with many shallow pools of water. Here we found the godwits concentrated in the Lucio Cuquero Grande, Veta la Palma. Here in the early morning and evening godwits spent much of their time foraging on chironomids with fairly consistent efficiency among individuals. We did not encounter any godwits on the rice fields, although it remains to be investigated how much time godwits spend in the rice fields at night.

In Extremadura agricultural parcels are smaller than in Doñana or the Tejo Estuary. Rice farming appears to be an equal cropping alternative among a mosaic of other options such as maize, cereal, olives and fruit (mainly apples). Many parcels were already ploughed after the previous harvest which leaves the ground bare during winter. At this time, in the early spring, annual grasses (probably *Poa annua*) have established on all of the exposed soil. In some parcels the ground was 100% covered by these grasses. Now that land preparation for the next cropping season is beginning, we noticed that many parcels were treated with herbicides killing off all plants that might have established. Nonetheless vast areas are used for rice agriculture and most were ploughed and flooded under 5-10cm of water or at least very wet with many shallow pools, with a few areas still containing standing rice stubble and plenty of surface water. We encountered godwits foraging and resting in the flooded fields with more variation in foraging efficiency among individuals i.e. individuals standing in close proximity to each other, widely differed in encounter rates of prey items. Likely, food availability being more unevenly distributed in the landscape than in the other areas we visited.

The habitat ground truthing data collection, for analysis with remote sensing data, has been successful in classifying 266 land parcels into different types of habitat – rice fields with different characteristics such as standing stubble, ploughed, flooded, dry or fallow; other agricultural crops which we specified as far as possible; wet grasslands used for livestock grazing; natural wetlands;

salt marshes; salt pans and shallow lakes. With additional spatial information on changes in landuse and the black-tailed godwit resightings database it should be possible to build a story about the varying environmental conditions within staging areas, how they have changed in recent years and the the stability or changes in preferred areas used by godwits. However, we miss some information on the quality of different staging areas when compared to each other. To study the quality of different staging areas we would recommend further more detailed studies of foraging efficiency, quantification of food availability and sampling, identification and chemical analyses of prey items.

**Summary of the people we worked with and spoke about the work we are doing:**

Rui Paixão	Manager Giganta and Ponta da Erva
Nuno Gomez	European BTG Ringing Schemes Database
Rocio Marquez	Post doc EBD
Jordi Figuerola	Senior Researcher EBD
Jose Masero	University of Extremadura (Badajoz)
Auxi Villegas	University of Extremadura (Badajoz)



Até logo, Adeus amigos, Tot ziens, Oan't sjen, Until next time!