

Black-tailed Godwits (*Limosa limosa*) in southern Spain; habitat description and finding colour marked birds from 1 – 9 October 2024

Doñana, Bonanza, Algaida, Brazo del Este & Odiel



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

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Chapter 1. in this report is based on and partly identical to previous reports about searching and finding Black-tailed Godwits in Spain that can be found on:

<https://www.globalflywaynetwork.org/publications>

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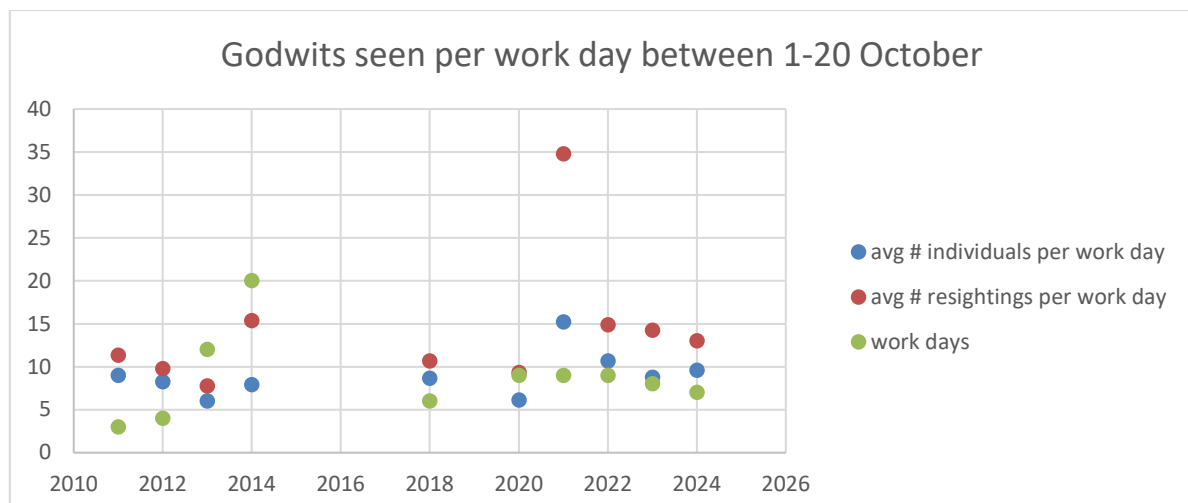
0. Summary

In this expedition from 1 to 9 October 2024 we visited the most important areas for wintering Black-tailed Godwits in southern Spain. Our aim was to resight individual colour marked birds, describe the habitats used by godwits and to gain information on threats and opportunities by field observations and meetings with local experts. In this report we present a daily overview of our findings with photos, locations we visited, numbers present and the first conclusions and recommendations. More reports from expeditions to Iberia and West Africa in previous years can be downloaded at: <https://www.globalflywaynetwork.org/publications>

One of the main goals of this week of fieldwork was to get as many resightings as possible in exactly the first half of October. The reason for the timing of this fieldwork was that in these two weeks one has the best chance to identify godwits that do not migrate to Africa at all, but stay in Europe for the entire non-breeding season. Based on tracks from geolocators and satellite tagged godwits we know now that godwits start returning from sub-Saharan Africa on a continuous scale between October and March, and that when the first ones are arriving in Iberia the last ones are still on their way there. Thus, the first half of October is the best period to find non-trans-Saharan migrants among the godwits; that is: the period with the least chance that the birds are still on their way to, or have already returned from Africa. These belong to the roughly 10% of all godwits that spend the entire northern winter in Europe - although some trans-Saharan migrants actually spend most of the non-breeding season in Europe too. These sightings in early October are important to explore if there are differences in survival between birds that do or don't cross the Sahara, a presumed large ecological barrier in their annual migration routine. The first results are discussed in chapter 2.

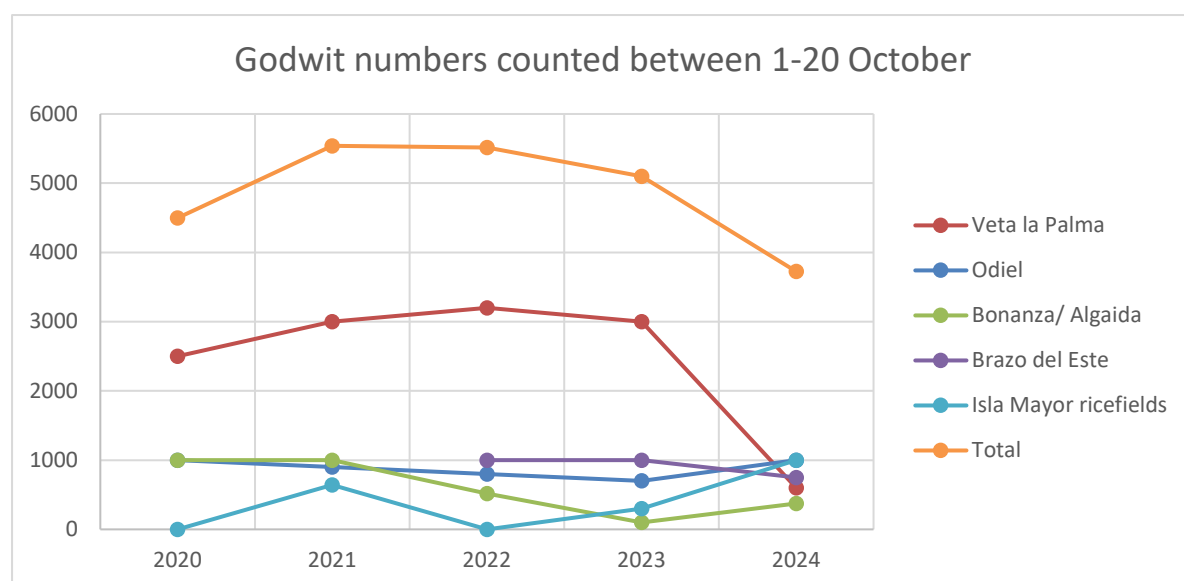
Resighting godwits in early October is not particularly easy: the birds spend a lot of time resting (on one leg in dense flocks) between 9:30 and 18:30 and since most rice fields have not been mown yet (or have not been used at all), they mostly forage in shallow water where they find Chironomid larvae. Yet, if the water is not shallow enough, one will end up staring at swimming godwits without seeing any legs. The weather can be a spoiler too; with temperatures above 30C it is almost impossible to clearly see the rings between 12:00 and 16:00 due to heat haze.

In 7 days, we scored 91 resightings of 67 colour ringed individual birds of our own scheme and 13 of 11 individuals from other schemes, which is a quite average score for the first 2 decades of October:



However, numbers were definitely lower and good resighting opportunities were scarce. Actually, the score for 2024 could have been much worse if we had not been so successful on the first and last day. At Odiel NP numbers were higher: 1000 compared to 700 birds last year (~800 in 2022). But the conditions for resightings were absolutely poor due to high water levels and, as usual, low ring densities: at the riverbanks at low tide, we checked at least 300 godwits but found only 2 ringed birds. The numbers at Bonanza were good this year (375) but after a morning of hard work we scored only 4 ringed birds. Here also, water levels were high and ring density low. Algaida and Codo de la Esparaguerra had no birds. Although a bit better than last year, numbers have definitely dropped in this area compared to 5 years ago. At Veta la Palma the decline was much bigger: maximum 600 godwits, compared to 3000 last year! Like last year, there were no ponds with optimal water depth for resightings and this might actually reflect the situation for godwits. They were mainly concentrated in the A5-pond, C7 and C8. The water level was quite high and they did not forage a lot. The water level at the big water reservoir was also too high for them. The lack of birds at Veta la Palma was partially compensated by a nice group of almost 1000 birds in a freshly ploughed and inundated set aside field in the ricefields of Isla Mayor. On the east side of the Guadalquivir River, a group of ~750 birds were found at Brazo del Este; we spent an entire day on this group and this provided 24 resightings. Based on the information of the birds with satellite transmitters, we basically covered the most important areas in the region.

The graph below gives an overview of the godwit numbers we counted during our field visits since 2020. Keep in mind that these counts were therefore just a snapshot in time and we only started visiting Brazo del Este since 2022, when godwits with satellite tags indicated that this area had become important, most likely as a result of the lack of suitable habitat in other sites as a result of the drought. But it confirms the overall impression that godwit numbers have declined in the area in recent years with the most remarkable drop in Veta la Palma. This does not necessarily mean that Veta la Palma has become less suitable; they use this area mainly as a daytime roost and therefore it might just reflect the overall drop in numbers in the area. But godwits would definitely profit from providing optimal habitat conditions as shown in the graph above when in 2021 the D3-pond had been drained and attracted many birds, which resulted in many resightings in that year.



Abdominal profile indexes as a proxy for body condition were comparable to recent years, on average 2.65 (n=164), 2.58 (n=95) in 2023, 3.26 in 2022 (n=97) in 2022, 2.59 in 2021 (n=104) on a 1-5 scale, where 1 is very lean and 5 extremely fat. Intake rates were also quite average with 17.9 Chironomid larvae per minute (n=23). In 2023 intake rates were very high: 25.6 (n=36), but only 10.4 (n=16) in 2022 and 18.7 in 2021 (n=37).

A second goal of this trip was to gather information on habitat selection and to recognize threats and opportunities in these wintering sites of the godwits in Spain.

Last year was the driest year in Spain of the last decade and less than 3% of **the rice fields in the Guadalquivir basin** could be cultivated. Last winter was also dry but early spring rains restored the water buffers. As a result of that, around 70% of the 40.000 hectares was in use for growing rice again, giving some relief to both nature and agriculture.

The **Doñana National Park** also profited from the spring rains but by October most marshlands were dried out again. Some tagged godwits visited Lucio del Membrillo in the south of the National Park occasionally suggesting there to be water but we could not check that site to establish the situation or the numbers of birds present.

At **Veta la Palma** the situation was not very different from 2023. Almost all intensive, netted, small fishponds have been abandoned and the focus is on the large ecological ponds. Now that Veta la Palma has been added to the National Park, the focus is on adopting a nature and water management plan: more fresh water habitat in the north that is allowed to dry out during summer, and more saline environment in the southern big ponds. One recommendation could be not only to facilitate habitat for waterbirds but also for waders. As it is already common practice to let ponds dry out regularly for sanitary reasons, it should be possible to generate a management schedule that guarantees ideal wader habitat with shallow water and mudflats throughout the year.

All godwits at **Brazo del Este** were in the protected area of El Capitán. We did not find any birds in the surrounding ricefields even though the harvest was already quite advanced at nearby Finca Casúdis where we found them in large numbers in 2022. The satellite locations suggested they often went there at night which matched perfectly with the rather inactive behaviour during daytime.

At **Odiel** the situation is still favorable and unchanged. The water levels were too high for easy ring reading but there was more than enough space for godwits to roost during high tide. We mainly found them in the saltworks whereas the traditionally good area Isla de la Liebre had very low numbers due to high water levels. The Odiel riverbanks were the only place where we saw them eating worms.

At **Bonanza** the situation was comparable to other years. Tourism seems to be increasing in the area around the pumping station. Perhaps as a result of that, a big fence was built to prevent cars from entering and now also attempts were made to keep out visitors on foot/ bike, but the wire fence was destroyed. At **Marismas de Trebujena**, a habitat restoration project had been realized with artificial lucios and nice surfaces of open shallow water; these will for sure attract many birds in the future.

1. Black-tailed Godwit Habitat and Demographic Studies

Introduction and backgrounds

The Black-tailed Godwit (*Limosa limosa*; BTG) is a farmland bird that predominantly breeds in The Netherlands (Verstrael 1987; Thijssen 1904). The current Dutch population is estimated at 25.000 breeding pairs (extrapolated from Kentie et al. 2016) but still represents an important part of the total continental BTG population *Limosa limosa limosa*. 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. Intensification and rationalisation 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). After the breeding season godwits migrate to southern Europe (Spain and Portugal) and West-Africa where they stay for wintering (Márquez-Ferrando et al. 2011; Hooijmeijer et al. 2013), mainly in agricultural areas such as rice fields. Throughout their annual cycle godwits select for farmland with a low to moderate land use intensity which makes them a key species to indicate routes towards sustainable agriculture. The Black-tailed Godwit qualifies since 2006 as “Near Threatened” on the IUCN Red List.

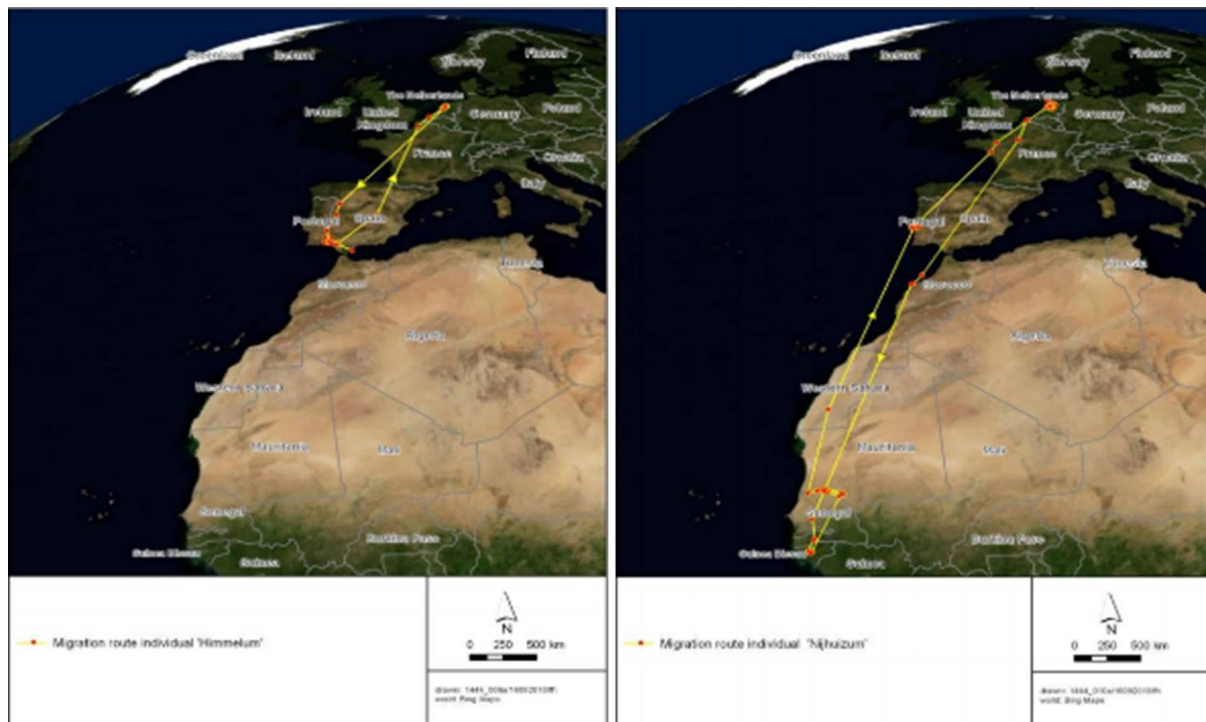
Demographic research Southwest Friesland

To measure the changes in population numbers and the causes, the University of Groningen started in 2004 a long-term research project in the south-western part of Fryslân, The Netherlands. In 2007 the research area expanded to 8400 hectares and since 2012 it increased again with another 1600 hectares (Groen et al. 2012). A colour-marked population of godwits was set up to make them individually recognizable. The knowledge that has been collected with this research has been implemented by policy makers and nature conservation organisations. Since 2020, the project has expanded into the Godwit Landscapes Project, still studying the godwit as a main focal species, but in context of the whole food-web of which it is part. Therefore, studies on soil macrofauna, predators, insect availability, vegetation changes and human land use management have been included (Hooijmeijer et al. 2022).

Migration and wintering sites Black-tailed Godwit

In the 1980's 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 predominantly 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 and Portugal. In the 1980s during the first counts, only 4% of the NW-European population used this area as a wintering site but recent estimates suggest a big change with up to 23% of the population wintering in Spain, mainly Doñana NP and surroundings. 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. 2014). For godwits, staying in 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 also want to do (demographic) research in West-Africa. We know now that juveniles are more likely to make these kinds of shifts

than adults (Verhoeven et al. 2017) and that the genetic component of their individual migration strategy is limited (Loonstra et al. 2023). These aspects can have consequences for changes in migrations patterns and 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.



Two classical migration routes of Black-tailed Godwits based on satellite tracking. The left map shows the route of an Iberian wintering bird. On the right an African wintering bird. Iberian wintering birds save a 6000 km flight and don't need to cross the Sahara twice (Hooijmeijer et al. 2013).

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. 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. In all these countries godwits are heavily dependent on man-made habitats like water buffers, fish farms, salt pans and rice fields.

With remote sensing techniques and the locations indicated by godwits with satellite transmitters, we found out that during the non-breeding period Black-tailed Godwits show a preference for stable habitats within a relatively low productivity range (EVI value 0.1-0.2), which are associated with open wetlands, low vegetation cover and shallow surface water (Howison et al. 2019). Additionally, godwits spend much of their time foraging either on the mudflats of saline mangrove wetlands or in wet rice fields, however little is known of the nature of the prey items at different times of the year. However, remote sensing data is difficult to interpret without accurate ground-truthing information. In the past years we conducted surveys categorising and describing habitats, measuring

environmental variables such as water salinity and soil penetration pressure, feeding efficiency of the godwits and carefully searching the substrate to establish the identity of godwit prey items.

Expeditions West-Africa and Iberia

In Southern Iberia godwits are largely confined to three major staging areas during northward migration: Doñana NP and Extremadura in Spain and the Tejo and Sado estuaries near Lisbon in Portugal.



Three main areas where many godwits can be observed during January-February; Extremadura (1), Doñana NP (2), Tejo-Sado (3)

Since 2005 we have started working every winter in those regions in close cooperation with local colleagues to study habitat use and collect resightings of individual godwits. Ring resightings in Iberia and West Africa are an important source of data for survival estimations in the different life stages of the godwits:

- 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 areas, we would assume that this individual is dead and therefore underestimate annual survival, because in the breeding areas individuals have very different resighting probabilities. Dispersal is especially interesting when looking at juveniles; resightings outside the Netherlands from adults ringed as juveniles give us insight in how many juveniles survive but go breed outside of our study area.
- Secondly, with enough resightings from the Iberian Peninsula and West-Africa 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 that cross the Sahara have a different survival rate than birds that stay the entire winter in southern Europe. A first analysis shows there are probably no differences in survival (see below).
- By measuring the density of individuals with colour rings, we can monitor the population size of the western European part of the Black-tailed Godwit population (Kentie et al. 2016)

We also regularly visit southern Iberia, in particular Doñana in the first 2 weeks of October. The reason for the timing of this fieldwork is that in these two weeks one has the best chance to identify godwits that do not migrate to Africa at all, but stay in Europe for the entire non-breeding season. Based on tracks from geolocators and satellite tagged godwits we know now that godwits start returning from sub-Saharan Africa on a continuous scale between October and March, and that when the first ones are arriving the last ones are still on their way there. Thus, the first half of October is the best period for correct identification of godwits as a non-trans-Sahara-migrants; that is: the least chance to misidentify a bird. You could safely say that these birds winter in Europe but a trans-Sahara-migrant is not automatically a bird that winters in Africa!

Until recently, West-Africa was the only area along the migratory flyway from which we didn't have many observations of colour-marked individuals. In the past, only small numbers of colour-ringed birds have been reported, mainly by birdwatchers and, more recently, by local scientists. Therefore, 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 region 2-3 times per year till 2019. This has yielded a great number of resightings. 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 to collect ground truthing data for spatial analyses combining satellite imagery with GPS-tracking information. In the near future we aim to continue demographic research and set up habitat study and restorations projects in this area in close cooperation with local scientists, volunteers and conservation organisations as part of the EU LIFE-IP Project Grass-Bird-Habitat. Moreover, a postdoctoral researcher received a MAVA-fellowship to study how godwits are responding to rapid wetland loss in one of the most important areas for Black-tailed Godwits in the Iberian Peninsula, the Doñana National Park in the Guadalquivir River basin of southern Spain.



In this expedition from 1 to 9 October 2024 we visited the Doñana NP, Brazo del Este, Odiel NP and the Bonanza & Algaida saltworks. Our aim was to resight individual colour marked birds, describe the habitats godwits used and to gain information on threats and opportunities by field observations and meetings with local experts. 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 Veta la Palma and the numbering of the ponds.

2. Overwintering on the Iberian Peninsula: a survival benefit compared to flying to Africa for Black-tailed Godwits?

Master Project Ronald van der Woude, University of Amsterdam

One of the main goals of these October expeditions was to collect data on godwits that do not cross the Sahara but spend the entire non-breeding season in Europe. We wanted to explore if there are differences in survival rate between birds that do or don't cross this potential ecological barrier. Master student Ronald van der Woude explored our data set for his master project but could find no differences. The text below is a summary of his findings.

Summary

Migration is an evolutionary adaptation that grants an animal increased resource availability. It allows animals to move from one peak in resource availability to another one. This adaptation is present in many groups of birds. Species are able to alter their migratory patterns to keep up with a changing environment. Individuals that are best adapted to a landscape changed by humans get selected upon. Compared to short-distance migration, long-distance migration is traditionally associated with a lower survival probability for an individual. This is true especially when migration involves crossing a dangerous geographical barrier. Previous research indicates that the effects of long-distance migration on survival varies among species. Some species experience negative effects, other no effect at all.

For this research project, we explored if such a penalty also exists for the Black-tailed Godwit (*Limosa limosa limosa*). The majority of these migratory waders winter in sub-Saharan Africa. They thus undertake a journey across a potentially dangerous geographical barrier. A small, but significant portion of the population never migrates further south than Iberia. To investigate if there is a survival difference between these two groups, mark-recapture data was utilized. Most of the marked birds breed in the southwest of Fryslân. Marking was done using colour-rings. Our data spans a period from 2004 to 2022. We performed an analysis using Cormack-Jolly-Seber models in a Bayesian statistical framework. We show that resighting probability is higher for birds wintering in Iberia. However, in contrast to resighting, no difference was found between the survival probability of birds that choose one wintering location over the other. The way in which we gathered the data, caused a bias in the survival probabilities for the godwits in our models. Due to this process, individuals with a high survival probability were over-represented in our data. The potential problem here is that we cannot exclude the possibility that godwits might have a higher mortality on their first trip to Africa and back. We just could not test such a possibility.

Our recommendation would be to include misidentification of colour-rings in future models of this type. Research has shown that misidentification causes a bias in survival estimates. Furthermore, we encourage further research in why long-distance migration causes heightened mortality in one species, but seems to have no effect in others. We hypothesize that size may play a role, possibly in relation with a species' life history. Our research project did not show a difference in survival for godwits wintering at different locations; we hope this contributes to understanding the life history of these birds better.

3. Literature

- 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.
- Hooijmeijer J., E. van der Velde, E. Rakhimberdiev, R. Howison, J. Onrust, R. Fokkema, G. Lagendijk, C. Kraamwinkel, R. Veenstra, L. Barba Escoto, M. Stessens, J-Y Duriaux Chavarría, S. Eren, M. Ligtelijn, T. Craft, R. Venderbos & T. Piersma. 2022. Grutto- Landschap-Project Jaarverslag 2021. Rapport van Conservation Ecology Group, Groningen Institute for Evolutionary Life Sciences (GELIFES), Rijksuniversiteit Groningen.
- Howison, R.A., Hooijmeijer, C.E.W. and Piersma, T. 2019. Grutto's als indicator voor veranderingen in landgebruik in de Sahel. *Limosa*. 92: 154-163.
- 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.
- Loonstra, A.H.J., M. A. Verhoeven, C. Both & T. Piersma. 2023. Translocation of shorebird siblings shows intraspecific variation in migration routines to arise after fledging, *Current Biology* 33: 2535-2540.
- 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.
- Márquez-Ferrando, R., Figuerola, J., Hooijmeijer, J.C.E.W. & Piersma, T. 2014. Recently created man-made habitats in Doñana provide alternative wintering space for the threatened continental European Black-tailed Godwit population. *Biological Conservation* 171, 127-135.
- 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. & Hötter, 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.

Thijssen, 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: 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.

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4. Birds and habitat, daily overviews 1 – 9 October 2024

2 October

Warm day with 32C maximum but a nice wind. Mostly clear skies, strong breeze in the late afternoon/evening.

Total number of godwits: 945 (Isla Mayor) and 188 (Veta la Palma)

We had already arrived yesterday from The Netherlands at our accommodation in Pilas and today we made an early start towards the fish ponds of Veta la Palma. On the way there we saw that the rice and cotton harvest was about to begin and large machinery was being prepared to get started. Later today we saw hundreds of storks on the freshly harvested rice fields, probably feasting on the crayfish that now became exposed.

Even before we arrived at Isla Mayor we saw a big flooded field that had been ploughed and was used as a water buffer. Probably the water was run-off water from the surrounding rice fields. When we arrived at the field, we immediately found a small flock of 150 godwits and scored our first rings. As the group grew to almost 950 godwits during the morning, it was already 14:00 before we left with more than 20 Dutch ring combinations in our digital notebooks. What a great start! The birds were on average quite lean with a mean abdominal profile index of 2.3 on a scale of 1-5 with 1 is very lean and 5 very fat (n=71). The whole morning they were alternately sleeping and foraging, probably on Chironomids. Intake rate was on average 18.7 prey items per minute (n=10). We took 2 soil samples that will later be analyzed for pesticides and heavy metals in the framework of the EU SYBERAC Project in cooperation with Wageningen University. Probably we will find loads of glyphosate as the edges of the water buffer were sprayed extensively when we were standing there.....



Foraging godwits in the Isla Mayor rice fields



Ideal circumstances for foraging godwits and ring reading on our first day near Isla Mayor

Later we searched for the location of a satellite tagged godwit on the other side of Isla Mayor and ended up at a rather similar water buffer in the rice fields. Another 8 godwits were present here and we took another soil sample. It struck us that substantially more rice fields were present than in the dramatic drought year 2023. Later we learned that the rains in February and March 2024 were enough to increase the surface that could be used for this crop to 60-70% of the surface area.

After that, we left for Pilas to have lunch/ dinner and to do some administration. Later that afternoon we visited Veta la Palma. Here was not a single rice field cultivated but we witnessed the planting of huge fields of olive trees, a replacement crop to cope with the reduced amount of rainfall in recent years. All northern natural lagoons were dry (Lucio de Cuquero Grande, Chico, Bocon etc.) but the water in the fishponds was actually quite high. Perhaps that was the reason why we found only less than 200 godwits in the A4 & A5 ponds. They were mostly actively foraging in the last hours of daylight but in the belly deep water we only scored 2 more rings and drove home after dusk.

3 October

Weather similar to yesterday.

Total number of godwits: 300 (Veta la Palma), 1000 (Odiel NP)

This morning we went straight for the Veta la Palma fish ponds. We did not encounter very big groups but the numbers in A4, A5, C7 and C8 added up to around 300 birds. However, the high water levels made it almost impossible to see any legs and we ended the morning with just 1 resighting of a German bird. Around noon we visited the office and met Miguel Medialdea who updated us on the status change of the fishponds from a commercial enterprise to a state-owned nature reserve with enduring potential for ecological shrimp harvesting. Currently, there are no more ponds anymore where fish are farmed. Only shrimp are caught in the large semi-natural fish ponds, about 3-4000 tons a year, with traps (called Dutch traps) but not by draining the ponds. They do drain 3-4 ponds per year for sanitary reasons which should provide opportunities for migratory or

wintering waders but when we visited there were no places like that available; that should be a focal point for future nature management as there are now initial plans for a comprehensive nature restoration project (€50M) but that does not apply to the hyper-intensive croplands in the north of Veta la Palma. The northern lucios will be connected to the river and will be filled with relatively low-salt water (4-5 gr/ liter) during the winter. These will slowly dry out during the summer. The fish ponds in the south will be filled with relatively saline water (25-30 gr/ liter) and will remain in use for shrimp production and provide balanced water management and the revenues will be used for the management of the area. This could be supplemented in the future by income from visiting birdwatchers and other nature lovers.



The A5 pond at Veta la Palma was good for maximum 600 godwits

In the afternoon we headed for Odiel NP near Huelva; this is a traditional site for staging godwits. Environmental agents Enrique Urbina and Lucas Caballero Montero helped us to locate the birds. Godwits use Odiel mainly to roost during high tide. This means that they sleep most of the time (on 1 leg....) and if the water levels are high, sighting rings can be very difficult as birds hardly move. We immediately ran into a big flock of 820 birds but with high water levels we only scored incomplete ring combinations. We continued and scanned the rest of the NP. Remarkably low numbers were found at Isla de la Liebre, which is usually a good site during high tide. But water levels were high and we could find no more than 100 birds and no rings. A scan in the southwest of the NP at Las Pajas brought us only 1 French bird in 80 birds. We returned to the first group and now they were more active as low tide was approaching and were able to score 5 ringed birds, incl. 1 code flag.

4 October

More clouds today and temperatures up to 28C, again strong wind in the afternoon
Total number of godwits: 310 (Rio Odiel), 500 (Odiel NP)

Today we planned to be in Huelva at low tide in the morning to scan the riverbanks for foraging godwits. All along the boulevard we found several small foraging groups, adding up to 310 godwits.

Although we could see almost all legs, we only scored 1 ringed bird and 1 code flag. The intake rates were extremely low with 1.17 prey items per minute ($n=6$). But if they found something, it was usually a big worm (*Nereis/ Arenicola spec.*?). We also took a soil sample for the SYBERAC project; it will most likely contain heavy metals with all those heavy industry on the riverbanks. Yesterday we had already seen that the godwits looked much fatter than in the rice fields of Isla Mayor and today we scored 41 birds: the average abdominal profile was 3.17, so indeed much higher. Despite the small window of opportunity of 4 hours to forage during low tide, the Odiel area seems a good place to stay.



The mudflats of the Rio Odiel boulevard in Huelva are only available for 4 hours to foraging godwits

After lunch we met again with Lucas and did the same tour as yesterday in the NP. We found only half the number of godwits and resighting rings was equally difficult. Despite that, we still managed to find 3 new ring combinations adding to the 2 new ones in the morning session.

5 October

Almost cloudless day with temperatures up to 28C, nice breeze in the afternoon

Total number of godwits: 300 (Isla Mayor), 550 (Veta la Palma)

We set out at dawn to repeat our successful first morning in the Isla Mayor rice fields. When we arrived at the water buffer, water levels were much lower but the number of godwits as well: still 300 that brought us 7 ring combinations, incl. a head started bird from the UK. In the group were 2 severely wounded godwits. One had a lot of fresh blood on the flank and the other a bloody broken wing; we are not sure what might have happened to them. The rest of the morning was spent searching for similar water buffers in the rice fields and we found 3. Unfortunately, we only saw 1 extra godwit. According to a farmer we met, these were actually not water buffers but fields that have not been used for any crop this year but have been ploughed to make them ready for next year. So far <1% of the rice fields had been mown/ ploughed. A scan over de National Park wetlands from the dike at Brazo de la Torre learned that they were indeed bone dry.

In the afternoon we again visited the godwit-wise productive field near Isla Mayor and scored some new rings. When the birds flew up, we saw that one of them actually had a satellite transmitter on its back; that was bird Lyts Brewaer, tagged near Wommels (NL) but its transmitter is no longer active. We continued to Veta la Palma and checked all sites that had godwits 2 days ago, adding up to 500 godwits today. These brought us another 4 ring combinations. In the evening they started foraging apparently on Chironomids; intake rate was not very high with 12 prey items per minute. Abdominal profile score was on average 2.94 (n=33). We also checked the big water reservoir in the intensive arable fields but water levels were much too high for godwits.

6 October

Temperatures were not that different from previous days but the absence of wind made it feel much warmer.

Total number of godwits: ~600 (Veta la Palma), 65 (Isla Mayor rice fields) and ~420 Brazo del Este

An early start brought us fog that only cleared after 10 am. By then the temperatures ran up rapidly and most birds in Veta la Palma were already asleep when we could finally see them. Numbers and sites were comparable to previous days and we scored a few new ring combinations. After that we checked the good field in the Isla Mayor ricefields but numbers had dropped to 65, without rings. We had a quick lunch in the field and checked the Dehesa de Abajo wetland which had fallen completely dry.



Lunch in the rice fields of Isla Mayor

We departed the area to explore the east side of the Guadalquivir River in the final days of this trip. We stayed at Las Cabezas de Juan from where it was just half an hour drive to the wetland of Brazo del Este, a former tributary of that same river. We readily found a nice group of at least 420 godwits but they were in an impossible place to see rings behind vegetation, far with back light and in deep water. Let's see if we can get better views in the next 2 days.

7 October

A mostly cloudy day, 27C maximum but as low as 20 degrees during showers in the afternoon
Total number of godwits: 375 at the Bonanza saltpans, 11 at Lucio Coca-Cola

We spent the whole morning at the Bonanza saltpans where the number of godwits present was 375. The water levels were high and it was hard work to score the 4 ring combinations we managed to read after 5 hours of intensive observations. But fortunately, all birds were foraging (on Chironomids) and showed their legs at some point. Intake rates were on average 18.9/ minute (n=10) and abdominal profiles 2.3 (n=19). A pity there were no more ringed birds in this group as the light conditions were good. We could see that despite the new fence the footpath outside the fish farm along the saltpans is still being used a lot by people on motorbikes, bicycles and horses, making this an all but quiet place to rest and forage. Fortunately, on this grey Monday morning we did not see anyone.



Saltpans of Bonanza early in the morning

When we arrived back at our car, we found out we had a flat tire but that could quickly be fixed in Sanlucar and we left for the Algaida saltworks. The road was still as bad as ever. By the time we reached the far end of the old saltpans, we were surprised by a short but fierce shower. The mud immediately stuck to our wheels and we barely managed to get out again. We passed by at La Coda de Esparaguerra but no godwits were present. On the way to Trebujena we saw that a big habitat restoration project had been realized in de Marismas de Trebujena. Artificial lucios and nice surfaces of open shallow water had been created and these will for sure attract many birds, hopefully including godwits, but not now. Let's hope the 2 observation towers and footpaths will not cause too much disturbance. On our way out we saw 11 godwits at the artificial WWF lagoon Lucio de Coca-Cola which might be a good example of what to expect of the newly restored areas in a few years from now.



Newly created wetlands at Marismas de Trebujena

We decided to leave to check the group we found yesterday at Brazo del Este. Unfortunately, the rains became heavier and we had to decide to call it a day at 19:00.

8 October

Foggy first but nice weather after, 50% clouded, 27C, nice SW breeze

Total number of godwits: 750 (Brazo del Este)

On the final day of this trip, we decided to check out Brazo del Este thoroughly as we had two failed attempts in the previous days. We left early in the morning but sat in the bar drinking coffee till 10:15 before the dense fog lifted. After that, the weather was great and with light from behind we could check a group of ~750 godwits in El Capitán, one of the former tributaries of the Guadalquivir river at Brazo del Este. Although the distance was quite far and most birds were asleep, we scored slowly but steadily a nice number of ring combinations. After 13:00 the heat haze really became too much and we decided to go for lunch in Pinzon. But when we were about to leave, 2 Marsh Harriers scared the whole flock and they landed in another pond close to the road. This was a great opportunity to read more rings and we continued till 15:00. After several unsuccessful attacks by the harriers and a Booted Eagle flying over, most birds were gone or in a site where we could not see any legs.



After 13:00 the heat haze became too much to see any rings.....

We decided to make a tour through the rice fields in the direction of Finca Casúdis where we read many rings a few years ago. The rice harvest had started and about 30% was already mown but unploughed. We saw hundreds of White Storks and a few thousand Glossy Ibises but only a single godwit. Perhaps they come to forage here at night? Driving through the rice fields we noticed that most of the fields were cultivated for rice again, at least 70%, and the area resembled the situation before the most intense drought year 2023.



Still a lot of rice to be harvested at Finca Casudis

We returned to the godwits and spent the rest of the day till dark scanning for more rings and concluded the day and the trip with a fantastic 28 resightings. In total we had this week 104 resightings of 78 individual godwits of our own scheme.



Situation at Brazo del Este with good resighting options close to the road

Appendix A: Godwit locations visited

