

Black-tailed Godwit Demographic Project

Why should Black-tailed Godwits still winter in West-Africa if Southern Iberia is just as good?

**Expedition Report University of Groningen and Global Flyway Network,
november 2014**

Funded by Birdlife Netherlands and University of Groningen

Jos Hooijmeijer, Haije Valkema, Bob Loos en Theunis Piersma



Wintering Black-tailed Godwits in Iberia (photo: Univ. of Groningen)

General

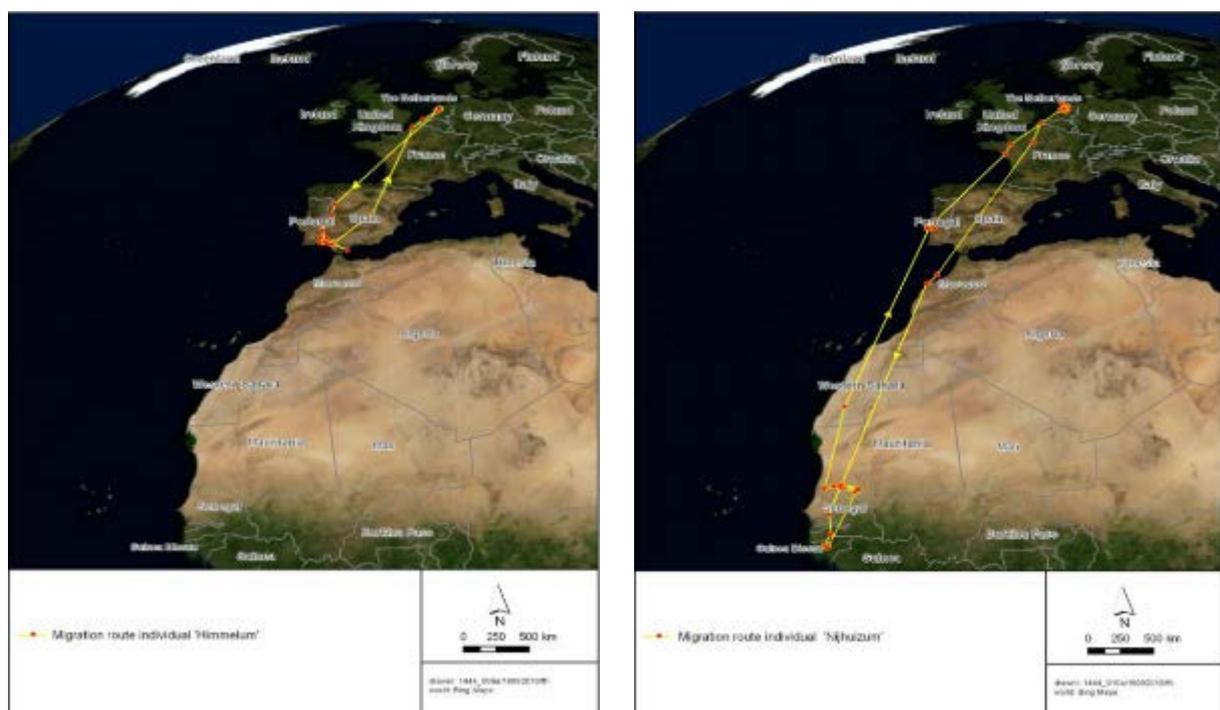
The Black-tailed Godwit (*Limosa limosa*; BTG) is a meadow bird (Verstrael 1987; Thijse 1904). The current Dutch population is estimated at 40.000 breeding pairs and represents an important part of the total continental BTG population *Limosa limosa limosa*. However, the number of breeding pairs have 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 major cause of the decline is the simple fact that the total 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). After the breeding season godwits migrate to southern Europe (Spain) and West-Africa where they stay for wintering. (Márquez-Ferrando et al. 2009; Hooijmeijer et al. 2011).

Demographic research Southwest Friesland

To measure the changes in population numbers and the causes, the University of Groningen has started a long-term research since 2004 in the south-western part of Friesland, The Netherlands. Since 2007 the research area has expanded up 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.

Migration and 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. Big numbers of godwits also occur in the inner Niger delta in Mali (Altenburg & van der Kamp 1985), but they belong probably to the eastern European population. Only recently, the wintering behaviour has partly changed because an increasing number of godwits decide to winter in South-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. **Figure 1**



Figuur 1. Two migration routes of satellite tagged birds in 2009. 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. 2011).

Conservation

The change in wintering grounds is remarkable and an important reason why we want to do demographic research in West-Africa. This change can have consequences for the survival rate of adults. Moreover this change can lead to differences in reproductive success, for example due to differences in body condition upon arrival on the breeding grounds. Both factors 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. Until now, West-Africa is the only site along the migratory flyway from where we don't receive many observations of colour-marked individuals. Only small numbers of colour-ringed birds have been reported, mainly by birdwatchers and, recently, by local scientists. Unfortunately the numbers of sightings are too small to make demographic comparisons between wintering sites.

Expedition West-Africa 2014

In November 2014 the University of Groningen, in cooperation with Global Flyway Network and financially supported by Birdlife Netherlands, embarked upon a 19 days expedition to the wintering grounds in West-Africa. We aim to set up a demographic research project in this area. Most important goal of this mission 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, prey choice, energetics and time budget. At this moment comparable research is done in NP Doñana (Spain), Extremadura (Spain) and the Tejo/Sado estuaries near Lisbon (Portugal). The last two are used as stop-over sites in February. We aim to continue our research at all these locations to find links between wintering sites, stop-over sites and breeding sites. Research questions we want to get into in the future with our work in West-Africa, Spain, Portugal and the Netherlands are:

1. 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?
2. Can birds change their wintering strategy during their life? And is this age-dependent?
3. Does reproductive success determine where birds winter?
4. Has the wintering strategy consequences for their migration and breeding phenology? And are there consequences for their reproductive success?

Between 10 and 28 November 2014 we explored the wintering grounds in Senegal, Mauritania and Guinea-Bissau with financial support from Birdlife Netherlands. Eddy Wymenga, Leo Zwarts, Jan van der Kamp and Otto Overdijk gave very useful information to set up this expedition. In Senegal and Guinea Bissau, the help of Khady Gueye (Univ. of Dakar) and Hamilton Monteiro (Wetlands International) was indispensable; thanks for your great organization skills and pleasant company in the field! Ecological consultant Idrissa Ndiaye showed us good spots in the Senegal Delta and Jan van der Kamp was our guru in Guinea-Bissau. In Mauritania Zein El Abidine Ould Sidatty and Blandine Melis helped us to get a overwhelming first impression of the Diawling NP. Thanks also to Mr Joaozinho Sa (Wetlands Int.) and Dr Daf Ould Sehla Ould Daf (NP Diawling) for their help behind the screens. We learned a lot from you all!

In this report we present a daily overview of our findings with photos, maps of all locations we visited, numbers present and the first conclusions and recommendations. We have also attached the life histories of all colour-ringed birds we observed.

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Trip report West Africa, 10-28 November 2014

10 November 2014

Travelling from The Netherlands to Senegal. At 12:00 o'clock departure from Koudum, 16:45 from Amsterdam Schiphol to Casablanca; 15 minutes delay in Amsterdam. In Casablanca we almost missed the flight to Dakar but due to several problems the airplane left 2 hours later than scheduled. So we arrived after passport check and visa control at 3 o'clock in the hotel.

11 November 2014

At 9:00 we met with Khady Gueye and Mr. Sylla (former director of NP in Senegal) to arrange the car rental and the money change. He told us that cutting the rice in the Senegal delta has changed in recent years from hand cut to being cut with big machinery leaving behind a high stubble which is unfavorable habitat for foraging godwits. After that we went to Geoffroy Citegetse (Birdlife International), we exchanged information about our project and their projects of BLI. After this short meeting we travelled towards Guembeul NP; at 4 o'clock we reach this area after a 6 hour drive. The places we checked (Cuvette de Ngaye Ngaye **Figure 1**) are the last part of the Senegal River Delta and fed by a mixture of fresh, sea and



Figure 2 Reading colour rings with Khady Gueye at Cuvette de Ngaye Ngaye.



Figure 1 The brackish flood plains of the Senegal river; in July this fills up with sea- and rainwater.

rain water **Figure 2**. Due to less rainfall this year and problems with sand blocking the water supply, the area had already dried up substantially but even in a very dry year as this (2014), there are still some major waterbodies available. The water comes in during the rainy season in July-September but before May it will dry out completely leaving behind a film of salt that is being harvested. In wet years big areas are covered with water. We saw around 170 Godwits and read 1 ring combination (code flag). Also we found 55 Spoonbills and read 2 rings (Spanish). We were accompanied by the warden Pape. After that we went to Mouit where we spent the night at the camp of the guards (Mussa is in charge there).

12 November 2014

Today we learned that big parts of the PN de Gandiol/ Guembeul have already dried up due to lack of rain and sand filling up the canals towards the Reserve **Figure 3**. At Toug we found a group of 65 BTG and read 1 code flag. All birds we saw in the reserve are actively foraging, probably on Chironomids. After a while they started to forage in dry sand dunes where they actively picked in the ground. We found out that they were probably foraging on grass seeds **Figure 4**. At Ngaye-Ngaye we found the bigger group again with 265 birds but >95% is foraging in belly deep water and we saw no rings. We tried at several other places in the Guembeul Reserve without luck. After lunch we looked for birds at the St Louis sewage plant where we saw 15 birds. We looked for birds in the big lagoons SE of St Louis, Leybar (eastern part) and Khor (western part). There were a lot of salt water waders but no godwits although Khady has seen a few thousand on the northern edges of the lagoon in recent years; but this year is too dry/ salty(?) for them apparently. At 19:00 we did a roost count at Ngaye-Ngaye: 360 birds, which is probably the complete wintering population in the area.



Figure 3 Salt pans next to the road; in some years godwits forage here but in a dry year as 2014 the biggest parts dried up already and no godwits were present in November.



Figure 4 right: Godwits actively foraging on Chironomids at Toug.

above: foraging godwits in dry sand dunes were they mostly forage on grass seeds and tubers.



13 November 2014

We started early in the morning at Cuvette de Ngaye Ngaye where the flock of yesterday evening is foraging: about 175 individuals mostly in belly-deep water. We tried to see rings for an hour but without any luck. We decided to move north towards the Tocc-Tocc Reserve. Just north of the reserve is a lagoon where godwits have often been reported but this time we found only about 25 actively foraging, probably on Chironomids. We extensively searched the area and the surrounding rice fields but without much success. Only 20 Godwits were present in a ploughed rice field, but we could not check for rings. More than 95 % of the rice fields was unsuitable for foraging godwits because no rice had been harvested yet and we think it will take another month before they will start cutting **Figure 5**. We saw also >240 Spoonbills and read a Dutch scheme combination; also about 120 Ruffs present. We finished the day close to the Djoudj Biological Centre where we found a flock of 52 with a Y5-bird that is regular visitor of this site; on the roads towards the center we only seen uncut, mainly large-scale, recently developed ricefields. Just before dark we found a group of 200 in Marigot du Khar but it is too dark to see rings. All birds here also foraging on Chironomids **Figure 6**.



Figure 5 Small scale rice fields in the Tocc-Tocc Reserve. More than 95% of the fields were not harvested yet but this small field was first harvested and a small flock of godwits used it to forage on rice.

14 November



Figure 6 Flood plains in National Park Djoudj. This area Marigot du Khar is an important winter site for White-faced Whistling Ducks (*Dendrocygna viduata*), but also small numbers of godwits were present.

Today we had breakfast at 6:30 and we went to the field at 7:15. We checked the Marigot du Khar where we saw yesterday around 200 Godwits. There were only 25 birds present now, but we were lucky and found 3 cr combinations. All 4 birds we saw in the Djoudj so far, were already observed in previous years which is a clear indication that this is their regular wintering site. Another bird had been observed in the Guembeul area last year; perhaps it escaped the drought there? At 9:15 we left and traveled to the border at Rosso where we arrived at 10:45. We crossed the river by boat; the regular ferry is for free but for a quick transfer by piroque you have to pay. We

had to answer a lot of questions by various employees but after some delay for paperwork we met the manager of NP Diawling (Mr. Zeine Sidaty) at 12:15. Although we were carrying 2.000.000 CFA and 2.000 E in cash, we did not have any trouble when we reported this. Due to car problems until 19:00 we had a delay and after it we left to Bouhajra (office of the NP) which is a 2 hrs drive over 90 km on a pretty bad road. But as a reward for a long afternoon waiting we saw a 2m Senegal Cobra crossing the road close to NP office!

15 November

We woke up today at 7:00 to discover the surroundings of our camp area before breakfast. At 8 o'clock we left and after a 1hr trip in a truly beautiful landscape Zeine dropped us off at the destination: the SW part of Diawling-Tichlitt near the village of Zire-Taghredi. It is amazing to see waders foraging between trees standing in the water and on Nuphar-vegetation. At first we only saw two foraging Godwits in a fenced wet vegetable garden that can only be used after the flood has gone. After a while we discovered a big group of BTG due to a Barbary Falcon that hunted them down. We estimated at least 1500-2500 birds were using this area, probably foraging on Chironomids **Figure 7**. It was possible to walk towards them on the mudflats but they were skittish and flew up together with the huge flocks of Garganey that used the area. But we followed the group as good as we could and managed to read the first 2 resightings for Diawling of BTG and also 2 Dutch Spoonbills in a group of 150 individuals. Reading rings was difficult, not only because of the limited access but also due to vegetation limiting visibility of the birds **Figure 8**. In the afternoon we had good views of both the Bell and Diawling basin via the main dike/road which are mostly covered by an open marshland vegetation with open water in between. Although this seems suitable habitat we only saw a few godwits and max 100 Ruffs. They can be numerous but we have not seen many in the past few days, maximum 300-500 birds. The people of the NP explained a lot about the area. The Diama dam was built to stop the ingress of salt water which affected agriculture but as a side effect the reduced amount of salt water has led to Typha becoming a pest species, covering vast marshland areas. Water of the Senegal is introduced into the area from various points in the river dike in the first week of July but it depends on the rainfall how quickly the basins fill up. After they have filled up, they close the water inlets and the area starts to dry out leading to a bare and dry landscape from March onwards. Opportunities for reading rings are limited and might be best just after the water starts to come in because the vegetation is no longer limiting the visibility but birds might be distant. Water levels are low and boats are hardly used which makes large parts inaccessible. Good moment to visit might also be around the midwinter count after 15 January: large numbers several thousands) are present and their locations are well known which might make a visit very efficient **Figure 9 & 10**.



Figure 7 Diawling, Mauritania. In this habitat 1500-2500 godwits share their wintering site with large amounts of European ducks.



Figure 8 Limited access to the most important site in the Diawling; the location was only reachable by a three kilometer walk partly through water.

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Figure 9 Bell basin in NP Diawling; This artificial floodplain gets flooded in July and changes from a dry area without vegetation into a swamp.



Figure 10 Bell basin in NP Diawling

16 November 2014

Today we left at 8:30 our camp area to cross the border again between Mauritania and Senegal. It was possible to cross the border at the Diama dam between 10:00 and 11:00. At 9:30 we arrived at the dam and with help of Zeine we could leave Mauritania and enter Senegal without any problems. Only 20 minutes later everything was arranged and we were free to explore Senegal again. Around 10 o'clock Khady, Idrissa Ndiaye (free-lance ecological consultant) and the driver Medoune Diop picked us up and we started to explore for godwits immediately. The first place we checked was the area south of the Djoudj where we saw in total around 50 birds mostly foraging on Chironomids during the



Figure 12 Ndiui. This location kept open from Typha by local fishermen to use for fishery. A small flock of godwits used this place to forage.

we saw a lot of intensively managed ricefields; at these fields they harvest rice twice a year during December and May. At these fields they do not plant small rice plants like they do in Guinea Bissau but they sow directly on the field. The cycle in which they seed in July and harvest in December is important for BTG; although they try to chase them with plastic and hard sounds, they manage to forage here a lot **Figure 13**. In some areas like Tocc-Tocc there is a stronger tradition of shooting birds. Also we collected 10 samples of Ruff faeces. At 15:00 we drove back to Ndiui where the same number of godwits were still present. We read another CR-combination of our own project and travelled to Run Ndiui where 100 Godwits were foraging on Chironomids. We saw 2 CR-combinations and a code flag but we could only read one CR-combination due to long distances.



Figure 11 The edge of ricefields are used by Ruffs that forage mostly on grass seeds of *Echinochloa pyramidalis* and 'wild rice seeds'.

morning. Most birds were in a small open area called Ndiui that is used for local fishery **Figure 12**. This area is only open because fisherman cut the Typha to enable fishing. Godwits seemed to be quite stressed and fought a lot with each other and several times they flew up due to a Marsh Harrier. Luckily we were able to find one CR-combination at this place from our own scheme. During the next stops we checked the rice fields SE of the Djoudj NP but we only saw a handful of Godwits. We saw about 100 Ruffs and managed to read a CR combination and a metal ring

Figure 11. At 12:00 we drove to the western edge of the Reserve of Ndiuel where we found no Godwits: the place was dried out completely. During the trip



Figure 13 Intensive ricefields at the Djoudj owned by French companies.

17 November 2014

This morning we scanned the southern half of the Djoudj NP. We found a group of 310 individuals in the Marigot du Khar and read 4 CR combinations and a Dutch Spoonbill. BTG were again all actively foraging in fairly deep water. Along the edges of the big central lake of the NP we only found a handful of birds but 10,000's of ducks and a distant group of 3000 Spoonbills. Ruffs were hardly seen, no more than 150 individuals. We continued our search along the SW dike in the direction of Tiguet **Figure 14**. We found about 50 individuals in small groups or solitary. Are these perhaps using a different foraging strategy? At 13:00 we had to leave to go to Palmarin where we arrived after an exhausting 9 hours drive.



Figure 14 Small flocks of godwits at Tiguet.

18 November 2014

The Palmarin area consists of a series of coastal lagoons at the northern mouth of the Saloum river that are partly cut off from the sea and filled with fresh, salt and rain water in the rain season, quite similar to the Guembeul Reserve. Local people exploit the lagoons for salt creating tens of 10m circular salt pans **Figure 15 & 17**. These salt pans and the lagoons are used by godwits to forage and roost. In the morning we found a group of 200-250 birds actively foraging in the water on probably Chironomids and under perfect light conditions we scored our first two rings. At some point we noticed that some birds had left the water and started to forage on the dry grass tussocks next to the mudflat. We dug up some sand and found out that they were foraging on the tubers of the most common grass species at this site and collected some droppings and plant material **Figure 18**. This pattern of individuals foraging on the grass and others foraging or resting in the water repeated itself during the rest of the



Figure 15 Palmarin. These very salty lagoons are wintering grounds for 1000-1200 Godwits in 2014.

day. In the morning we found several groups (in total +/- 500 birds) under excellent observation conditions but ring density was low. But on the way back to Dakar we found a big group of 500 birds near Joal under perfect light and water level conditions and we ended the day with 28 resightings, doubling the number seen in Senegal and Mauritania! On the way back we dropped off Khady near Thiès and Idrissa in a Dakar suburb and thanked them for the perfect cooperation and organization. In Dakar we spent the evening ordering our faeces and seed samples (including the 40 samples Idrissa had collected in October) and writing up.



Figure 16 Palmarin. Godwits resting and probably drinking in the end of the morning at this fresh water pool in urban area.



Figure 17 Palmarin. Salt pans used by godwits.



Figure 18 Godwits were actively foraging on the tubers of *Enteropogon prierii*, an abundant grass species on the edges of the lagoons and salt pans.

19 November 2014

Today we traveled from Dakar to Bissau. The airplane followed the coastline and we had good views of the Palmarin area, the delta of the Sine Saloum, Gambia river and Casamance. With half an hour delay we arrived at 13:00 in Bissau. Jan van der Kamp and Hamilton Monteiro picked us up from the airport and without any problems we dropped our luggage at the hotel. We used the afternoon to buy food and equipment for the coming week.

20 November 2014

After some final shopping we started exploring the ricefields SW of Bissau. We started in the area behind Prabis but only found some dry ricefields. We returned and just before Bissau we looked for birds in the ricefields south of Ponta Gardete. This is a vast ricefield complex but after scanning the area for half an hour we still had not seen any godwits in the air although there were quite some raptors flying over which should have made them fly up **Figure 19**. In the late afternoon we did a roost count from the Ponte Consalacao at the Rio Mansoa. We saw about 60 birds coming from the east



Figure 19 Ricefields south of Ponta Gardete; there were no harvest activities yet and for that reason no godwits.

and north, falling in in the area near Blom. We prepared a campsite along the road to Bula and spent the night there.

21 November 2014

We woke up today near Bula and after breakfast we went immediately to the field. First we started at Intatelai where we found only 3 godwits. In this area the rice yield was almost completely lost. Although



Figure 20 Open patches in the ricefields of Pache lala used by resting godwits. These places were suitable to read ring combinations.

there was no rice, it was still wet and it looked suitable for godwits. After this area we traveled to Pache lala where we started to explore for godwits in a gigantic rice complex. Julio Imcombo, a local contact of Wetlands International saw here the last days a lot of godwits. We estimated that in total 1200 Godwits were present in the whole area, mixed with small numbers of Ruffs. It was suitable for godwits because there were small open places with shallow water or failed crops everywhere **Figure 20**; the first rice was being harvested and laid to dry on the

small dykes **Figure 21**. We spent the rest of the day searching for godwits and in the end we saw 8 different combinations from our own scheme and 3 combinations from other schemes.

Ring reading was not easy because the birds were mainly foraging between the rice plants or stubble and good sights were prevented by the dykes; we could most of the time not approach them close enough before they flew up. We set up our campsite in the village next to the ricefields.



Figure 21 Harvested rice in Pache lala (right). Rice needs to dry on dams before it is collected and brought to the village. Godwits can forage on this drying rice with a high success rate. Locals try to avoid this by scaring them with sounds and stones (left).

22 November 2014

At the moment we planned to leave our campsite we had to deal with car problems, but after half an hour this was solved and we left. The next stop, the ricefields near Cuboi on the northbank of the Rio Mansoa looked promising c with a nice mixture of ripe rice and unused wet spots but we could not find more than 10 godwits. The rice was about to be harvested but no fields were cut yet. A local ricefarmer told us that godwits are shot near this village which might explain why we saw so few birds. We continued the rest of the day near the next village of Unche. This is a very



Figure 22 Good managed rice fields at Unche; rice harvest has started. This is a very wet area, with very well maintained ricefields and good looking crops. The harvest was at about 25% in this area and we saw many small groups foraging on the harvested rice that was laid on the dykes **Figure**

22. The total number present was hard to account for but no more than 100 birds. We checked about 60 birds and were lucky with 3 ring combinations. We set up our campsite in the village Unche.

23 November 2014

We started again at the rice fields around the village Unche where we hoped to see more birds than the day before. Unfortunately we saw the same number of birds again, around 100. Luckily we managed to see two new CR-combinations and two CR-combinations that we saw the day before. Around 10:30 we left the area to a wetland just north of Sao Vicente where JvdK had seen 200 birds one week earlier. However when we arrived we could only find 10 birds in the distance. We returned and after crossing the two bridges we arrived at Cumano-Ensalma. At this site we planned to walk around the whole area, a three hours trip. The first kilometer we saw around 40 birds in a suitable area with a lot of open water spots. The rest of the area we could see from a distance, had no suitable places and rice was not harvested yet. So we walked back and 1 hour later we observed it from the other side near the old bridge close to Ensalma. In this part the rice culture had completely failed due to a dike break; no godwits were present here either **Figure 23**.

We continued our work at Bupe; this place was used by a satellite bird in the past so a good reason to check the area. When we arrived we saw a big green rice area, rice harvest had not started yet. After 30 minutes of observations we saw only 1 bird and decided to go back to Cumano, where wanted to check a possible roost site in the mangroves. At 18:15 we arrived here and concluded that there was only a hand full of godwits present. We observed the sky for 30 minutes and counted in total around 800 birds that flew very high in the direction of Blom/ Ome and 60 birds that

flew in the direction of Ensalma. We called it a day and slept at Hamilton's place in Bissau.



Figure 23 Flooded rice fields due to a dike break close to Ensalma



Figure 24 In the rice fields at Blom farmers harvested the rice and let it dry on the fields.

24 November 2014

In the morning we started to explore the Biombo peninsula NW of Bissau. Our first stop was at Ome on the southbank of the Mansoa river. Due to a breakthrough of the main dike, the rice crop looked rather poor and we found no godwits. We quickly moved on to Blom which was a good area for godwits in the past. The first looks seemed rather disappointing because also here a breakthrough had wiped out most of the rice fields. But on the far eastern and western edges we still found good spots for godwits and about 20% of the still standing rice had been harvested **Figure 24**. In total we counted 190 godwits and found 4 colour rings, but only 2 were of the RUG scheme. We hoped that this place would turn out to be the main roost area but a roost count

later in the afternoon was rather disappointing with only a maximum of 40 birds that were mainly foraging till sunset **Figure 25**. We saw however some groups flying further west but who knows where the roost is? Before the roostcount we made a quick visit to Quintungul but saw no birds; <10% had been harvested and we saw no open spots suitable for godwits. Campsite at Blom.



Figure 25 Possible roost place for godwits at Blom, but only a couple of godwits were present at sunset.



Figure 26 Quintungul. Marginal fields on the edge of mangroves were 800 godwits foraged and roosted.

25 November 2014

We started today at Quintungul, exploring the western part of the boulanjas until the village of Reina. Here we found a nice area with suitable places for godwits. The harvest of rice had just started and around 5% of the total area was cut. At this place we found a nice group of 800 godwits that used marginal fields on the edge of the mangroves to roost and forage; we spent until 14:00 to check for CR-combinations which was relatively easy because we had a good overview from the main dike. In total we found 11 CR-combinations and checked at least 80% of the birds **Figure 26 & 27**. The next stop was

Bucomil were we found a complex of flooded rice fields due to a breakthrough of the dike but no godwits were present. We continued to Dorce, a good looking area where they had harvested only a couple of fields. Between 16.30 and 18.30 we checked the whole area. We saw in total 15 Godwits, and no CR-rings. Campsite at Dorce.



Figure 27 Transporting rice from the fields at Quintungul.

26 November 2014

On our last full day in the field we headed for Mansoa, upstream the Mansoa river. Last week co-workers of Wetlands International had spotted a large flock of godwits east of the city near the village of Ussmtche. We arrived at the end of the morning and quickly found the birds. A flock of approximately 2000 birds was foraging on a grazed mudflat between the rice fields **Figure 28**. All birds were actively foraging the whole day and could, with some care, be observed from a close range. We stayed the whole day near this flock. Even though the ring density was low, we ended the day with 18 birds of our scheme and 5 more from other projects. We took soil samples and found out the birds were probably foraging on grass/ wild rice-seeds.

We also collected some faeces samples. We headed for Pache to set up our camp site that we reached at 21:30.



Figure 28 Thanks to Hamilton we discovered this place at Mansoa. 2000 Godwits were actively foraging in wet grasslands and grazed mudflats.

27 November 2014

We used our last morning in the field to check the Pache lala-area once more. The group we encountered earlier this week was still present and had even increased to around 1500 individuals. This area was so attractive for them because they have started harvesting and in the central part of the valley is a wet area with low-productive wet rice fields which they mainly use to roost during the day. The local Balanta-farmers try to scare them off but this is very low profile **Figure 29**. Because of that, the birds can be observed from a fairly close range. Our yield this morning was 18 birds from our scheme. After a final meal we headed for Bissau where arranged the financial aspects of this mission with Joazinho Sa, head of Wetlands International in Guinea Bissau. At 22:30 we went to the airport to check-in even though our scheduled departure time was at 3:40 but check-in was apparently only possible till 0:00.



Figure 29 Rice harvest in Pache lala. In a couple of days big parts were harvested already and harvested rice was placed on piles. Godwits foraged partly in harvested fields (under) but also in low-productive parts (above).

28 November 2014

Travelling back to The Netherlands via the Cape Verde islands and Morocco; arrival in Amsterdam at 17:00.

Summary, conclusions and implications for conservation

Summary

The main goal of our mission was to find out which areas in West Africa are suitable for setting up a colour ring resighting-program on wintering Black-tailed godwits. This should eventually lead to a dataset that allows to compare demographic parameters of birds that winter either in Iberia or in sub-Saharan Africa. These areas should at least meet the following requirements:

1. Number of individuals present in the area should be considerable to ensure that enough data can be acquired. These numbers should be predictable and occur every year.
2. Colour ring reading options should be favorable; high vegetation or deep water for instance can decrease the visibility of rings. Birds also need to be approachable.
3. Logistics at the site: can the location be explored without much trouble and are local experts available.

Hereunder we will give an overview if the locations we visited meet these requirements. The locations can be found in the Appendix.

PN Langue de Barbarie/ Guembeul/ Gandiol

Numbers can be as high as several thousands of individuals but in a dry year like 2014 only a few hundred are present; moreover were these birds hard to observe because they were foraging mainly in deep water. Logistics and facilities are no problem but the unpredictability and poor visibility are.

PN Djoudj

Godwits are mainly foraging in natural habitats where they are relatively easy to observe. However, the total numbers in November are low and like in the previous areas, consist mainly of residents that have already been recorded in previous years. The vast ricefields outside the NP were mostly without godwits but this might change once the harvesting has started. The ricefields are easily accessible and might, in the right season, offer opportunities for resightings.

Reserves Tocc-Tocc/ Ndiael

Ndiael was completely dried out in 2014 and accessibility of the birds might be problematic in wet years due to long distances and lack of roads. Tocc-Tocc is in principal ideal for reading rings but we only saw a handful of birds but we heard from local experts that this might vary a lot. In wet years this might be an area to consider.

PN Diawling

The basins of Diawling and Bell are quite inaccessible and can only be observed from the edges. With some luck, we found a big group but they were extremely hard to get close to due to mixing with flocks of ducks that flew off from a large distance. With some patience, it should be possible to get more resightings out of this area than we did. Local experts told us that especially in July and January thousands of birds are present for a short period and this is supported by data of our satellite transmitter birds. This high turnover could potentially be ideal for a collecting a large dataset in a relatively short period. If such a mission would be performed around the 15th of January, the annual midwinter count could provide valuable information on the main sites of interest. However, the high vegetation could be problematic and for that reason, July might be more favorable.

Palmarin

At this site we found the highest number of godwits and colour rings of Senegal. Resighting conditions in November are ideal with low water levels and good accessibility. Most birds we encountered were residents and already present for several months. It would be worthwhile to find out if many migrants pass by in July- August or on the way back to Europe in December. Khady Gueye has probably the data to verify this.

Guinea Bissau/ Bissau area

In contrast to the previous sites, we almost exclusively found godwits in rice fields. The birds preferred those areas where the harvest had started and if there were patches of low rice productivity with sparse vegetation, abandoned fields or open, shallow water. We saw them switch very often between these kind of fields and freshly cut or ripe rice fields. Areas where the rice crop had failed completely were avoided. Logistics are more problematic because the fields are remote and can only be explored on foot. It sometimes costs half a day just to establish that an area is not used by godwits. Another problem in November is the poor visibility of the birds due to the uncut rice vegetation. A bonus is the good network of the local expert Hamilton Moneiro, which brought us to the biggest flocks. Without this network and knowledge it will be hard to find birds in these huge areas and you need to be lucky to find big groups. Planning the resighting-work just after the rice has been cut, might be the best strategy.

Conclusions

With hindsight, November is not the ideal month for a colour ring expedition even though we came home after 2,5 weeks with a respectable 110 resightings of 95 birds of our project and more than 20 of other colour mark programs . The wintering population in NW Senegal can easily be covered by local experts with good knowledge of the different colour ring schemes and good equipment like Khady Gueye. We could not add much to her work. It might be interesting to investigate further if an area like Palmarin or Djoudj is worth to explore in July when birds make a brief stopover just after crossing the Sahara. As said earlier, Diawling is probably more interesting in either July or January, although the big flock of 2000 birds might have yielded more. Guinea Bissau provided the highest number of resightings but it would have been better to arrive just after the rice harvest in December because the increased visibility of the birds would for sure have led to more resightings. The presence of the local expert Hamilton Monteiro is a big plus. Idrissa Ndiaye suggested that the Casamance area in S-Senegal could be a good alternative in August. After leaving the Senegal-delta, this region is preferred by thousands of birds that can be found in the "tannes", salt water bodies within the ricefields. Our satellite transmitter data confirm this idea.

Conservation

With this expedition we have taken a first step to answer the question why Black-tailed Godwits are shifting their wintering grounds towards Europe and what the consequences are for their population dynamics. Is it advantageous to winter closer to the breeding grounds because those birds have a lower winter mortality and perhaps even a head start because they arrive earlier and in better condition to the breeding grounds? With the resightings from this expedition we have a (still fairly limited!) dataset of birds that have wintered for sure in Africa and we can compare those to birds that have wintered in Donana NP in Southern Spain. We have indications from this expedition and the work of Khady Gueye that birds are faithful to their wintering location. If this were to be a robust result, site-faithfulness would be a big advantage when it comes to calculating differences in annual survival between north vs south of Sahara wintering godwits, calculations which require long time series anyway. It would also facilitate comparing migration phenology and we aim to incorporate the data from next breeding season to make

this comparison. This means that by the end of 2015 at the earliest we might get a first hint of potential differences between the two wintering strategies and the consequences for the population.

We have seen wintering godwits from Mauritania to Guinea Bissau and the fact that they occur spread out over big parts of West-Africa is already a clear indication of their flexibility. In the north they mainly use natural habitats in the floodplains of the Senegal and Saloum delta; these can vary from fairly freshwater to extremely salty. During the present survey we hardly saw any godwits in ricefields, but that might very well be due to the fact that the harvest had not started yet. It is hard to imagine that they will not use these fields especially since the timing of the harvest coincides perfectly with their northward migration in December. If so, they might even profit from the large-scale turnover of dry Sahel vegetation into irrigated ricefields, which is eminent all along the southern borders of the Djoudj NP. A striking parallel development has taken place in the floodplains of the Rio Guadalquivir in Spain which is now the alternative wintering location and important for many waterbird species: Donana NP! A point of concern is the invasive growth of *Typha* in large parts of the Senegal delta. This species might potentially make large areas of godwit-habitat unusable. Nevertheless, it would require detailed work on intake rates and daily time budgets to be seen whether the great flexibility demonstrated by the godwits reflects easy or difficult living conditions. Other studies have shown that animal preys are preferred over a vegetarian diet and eating grass tubers or seeds might very well indicate that they don't have an appealing alternative.

In contrast to north Senegal and southern Mauritania, in Guinea Bissau the birds were almost completely reliant on man-made habitat. We almost exclusively found them in or near ricefields. They have a clear preference for wet ricefields that have the right mélange of high productive fields, unused/low yield fields and open water. We were there when the harvesting had just started and found almost no birds in areas without active harvesting. This makes you wonder where they occur before any harvest has taken place! Perhaps they follow the harvest activities from south to north or use natural habitats like river banks and ponds in the mangroves. A thorough analysis of the satellite transmitter-data should shed light on that. A potential threat in Guinea-Bissau could be the poor maintenance of the main river dikes that protect the ricefields from flooding. We have seen many areas where the rice crop had failed completely this year or already for many years in a row. Restoration can be too costly for local communities and rice fields will be abandoned.

Although we know that it sometime happens, we have no indications that birds are actively persecuted at a large scale. In the Senegal delta where they were mostly confined to National Parks anyway, they seemed to be left alone completely. In the ricefields of Guinea Bissau we saw people trying to scare them off with hard noises or stones but this was all very low profile. The fact that we could get fairly close to the birds is a clear indication that they don't have negative interactions with humans too often.

The remaining (extensive!) area south of the Sahara with Dutch-breeding wintering godwits, which was not surveyed during this survey, were the rain-filled scattered wetlands in the Sahel of southern Mauritania which and the inland wetlands along the Senegal river. According to the satellite tag records (see www.keningfanegreide.nl), these are used by a fair proportion of the tagged birds and in the past we have also witnessed birds migrating as far inland as in the Inner Niger delta in Mali. The use of such a great diversity of areas may either indicate shortages or abundances of opportunities. Ongoing work documenting (seasonal) survival in combination with detailed foraging studies should eventually enable us to distinguish between these two contrasting possibilities. Such distinguishing scientific power seems critical for any science-based conservation initiatives.