

# Black-tailed Godwits in Friesland, The Netherlands



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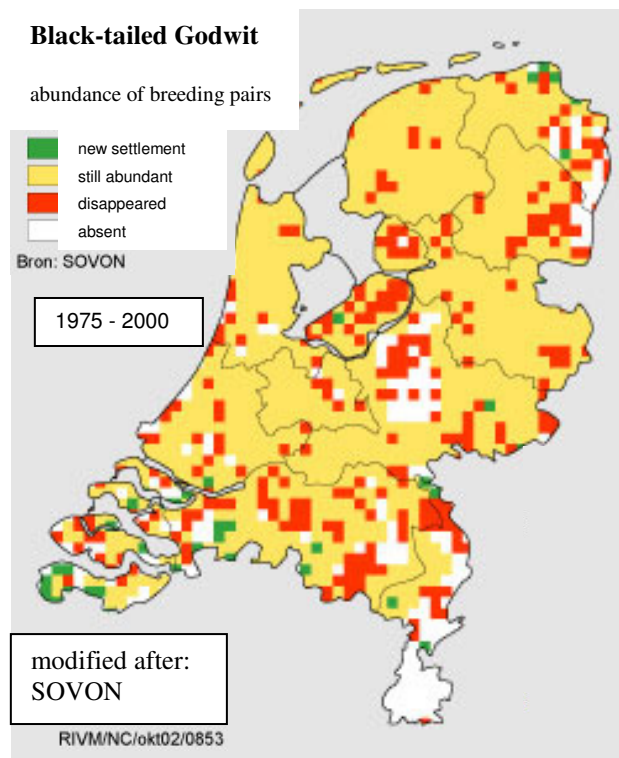
## Newsletter 2004

### Research

There might be no other bird species being more characteristic for, but also dependent on The Netherlands. Up to 80% of the Western-European population of the Black-tailed Godwits is breeding on the vast and green Dutch meadows. However, the international decline in numbers proceeds here to the same degree as elsewhere: where volunteers counted as many as 120.000 breeding pairs in the 60ies, numbers barely reach 40.000 pairs today. The trend is stable; there is no prospect of a reduction in the decline.

#### Black-tailed Godwit

abundance of breeding pairs



This strong decrease is caused by several well known factors. Loss of breeding areas, qualitative reduction of the remaining breeding grounds due to increased intensive agricultural practice resulting in an extremely low breeding success. Predatory influences are not ruled out when it comes to direct causes for a low reproductive success. Additionally, a recent study points out the possible reduced adult survival during winter times. The decrease of population numbers on agricultural land is somewhat expected, as mowing takes place mostly very early in the season when the birds still have eggs or very young chicks. In case the nest is not equipped with a nest protector, mowing at this time leads to a high mortality of eggs and chicks. Additionally, it might reduce the food availability for chicks that survived the blades.

Even more alarming, the decline is also present in well protected areas where mowing is postponed until the chicks fledge and predation pressure is apparently low. Studies show that even in those places, the reproductive outcome is not sufficient to keep population numbers stable.

The aim of this study is to gain more knowledge about the processes leading to this decline of this species. We want to find possible intrinsic and external causes for the decrease of the Black-tailed Godwit in the Netherlands.

### Study area

A study area for this study was found in Friesland, in the north of The Netherlands. Our study area lies in the northern part of the so called Workumerbinnenwaard - or Gaasterstrân in Frisian, which is the locally spoken language. We chose for this 250 ha sized area because it harbors high breeding densities of Black-tailed Godwits. Additionally, the area is a protected meadow bird area and partly managed by a local NGO, It Fryske Gea. The other parts are owned and used as hay meadows by local farmers. But because of the status as a meadow bird area, mowing is not allowed to take place before the 1<sup>st</sup> of June. This gives us the opportunity to study godwits in a close to natural situation where the chicks hatch safely without using any kind of nest protection.



Abb. 1) right: location of the Workumerbinnenwaard (red arrow) in The Netherlands. Left: The northern part of the Workumerbinnenwaard (red outline) and the location of the field station (white arrow)

### Getting started

In February 2004, the first important obstacles were overcome: It Fryske Gea and the local farmers gave their permission to enter and work on the different plots. Being very hospitably, It Fryske Gea offered us to put up a field station on their ground, a perfect base for our fieldwork. Additionally, the local Fûgelwacht Warkum, a NGO that is in charge of the assessment, monitoring and protection of meadow bird nests in the area, agreed on exchanging information on known nest sites of Black-tailed Godwits. The so-called "nazorgers" would, after thoroughly searching their plots, give us a map with detailed information about Godwit nesting sites. Most of the nazorgers were quite enthusiastic about the project, but a few uttered concerns. They worried about "their" birds and wondered whether we would affect the nest success or whether our activities would attract predators. But whilst the project proceeded, the concerns faded and now everyone is looking forward to receive preliminary results, and, of course, the next field season.

## Nest phase

Getting the locations of every Godwit nest from the Fûgelwacht Warkum saved us a lot of intensive searching work. Additionally, the disturbance of the nesting birds was thus kept very low. We visited the nests in the early phase only once, to get the GPS position, to measure the eggs and determine the expected hatching date. The latter was done by determining the angel an egg would float in water. With this value, the lay day and thus the expected hatching day can be calculated. Now, we would never come back to the nesting sites until around four days before the expected hatching date.

The mean lay day was the 23<sup>rd</sup> of April, but the early nests have already been laid in the first week of April. We gathered data of a total of 90 nests. The total number of breeding pairs was 144 in 2004, which is low in comparison with 230 in 2003. But as this decline was already obvious before we started working, it is very unlikely due to our activities.

Around four days before the expected hatching date, we visited the nesting sites again. When the chicks in the eggs started beeping, or the eggs showed breaks in the shells or even holes, we started catching the adults. This was done using a walk-in cage placed over the nest. After we left the nesting site, one of the parents would come back, eager to stay with their eggs in this last phase, and sit down on the nest. When one of us would then run towards the nest, the bird would panic and not find the exit anymore. The breathless researcher could reach into the cage and pick up the bird. It was then measured, weighted and blood samples were taken. And, most important, we would ring the bird with an individual color ring combination. These bright color rings are well visible for an observer in the field, even from quite a distance. This way, we are able to address individual birds in the field by only noting the color ring combination



We caught 66 adults with this method.

The hatching success was not affected by catching with this method. Because we caught in the last days before hatching, abandonment of the nest was no topic for the excited parents.

We did catching trials on 63 nest, and only 2% of these were predated and 6% abandoned by the parents afterwards. These numbers are not only smaller than the ones of nests where we did not try catching, but also very low in comparison with other studies. This is of course partly due to our late visits, but still comforting

to know...

One of the most intriguing results was the very robust trend that early laying females were not only in a better condition, but also laid bigger eggs compared to females that laid their eggs later in the season. This "the-earlier-the-better"- phenomenon is something one can expect of most bird species. But we did not expect to find such a clear and robust trend in a dataset of only one year. This indicates that the timing of breeding is very important in the reproductive success of the Black-tailed Godwit.

## Chick phase



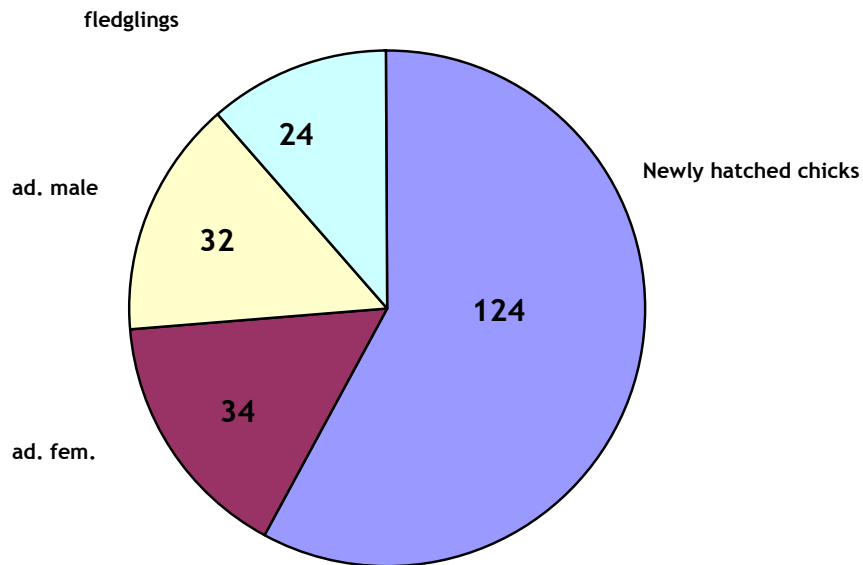
Our strong indication towards a timing effect is consistent with our findings during the chick phase, too. Early nests have a higher probability to hatch, and the chicks seem to have higher growth rates, too. To sum it up, we found a strong and consistent negative effect of lay day on reproductive success. Our success in catching at least one of both parents of 47 nests allowed us to follow the families and determine fledging success of the chicks. But even though the color rings made it very simple to follow individual families, recapturing the chicks was a hard task. When their parents started alarming a possible predator (or a researcher looking for them), young Black-tailed Godwit chicks pressed themselves on the ground and stopped moving, which made it extremely difficult for us to find them. So in cases where we could not find chicks, we had to take the alarming behavior of the parents as a cue and took for granted that at least one chick survived, even if it might have been more in reality. Another problem in determining fledging success was that some families left the area together with their chicks. It has been reported that Black-tailed Godwit families cross rivers and walk up to 3 kilometers to guide their young to better foraging areas. We were not able to find these families or distinguish this case from the one where all chicks died and the parents left the area. Therefore, the estimated fledging success is a rather conservative measure. The average fledging success was 0.2 fledglings per breeding pair in 2004, or 1 fledgling per 5 pairs. This is extremely low and not enough to sustain the population. Because of the above reasons, it might have been a bit higher in reality. However, we do not think that these uncertainties might turn the trend. We assume a very low, insufficient fledging success. This result is in accordance with findings of most other meadow bird studies that took place in The Netherlands in 2004. One possible reason for this low reproductive success might have been the extreme dry spring, which might have had an influence on insect and soil arthropod density and -availability. This, in turn, might have had an influence on chick mortality. Due to low nest predation events during the incubation phase, we do not expect that predation played a big role in chick survival. Another phenomenon indicates in the same direction. In earlier years, one could observe a lot of families guiding their chicks outside the dike, where we assume better food availability. This did not happen this year, which was surprising for many experienced local observers. But the reason might have been the dry spring, too. As vegetation outside the dike did not grow as it would do in earlier years, the area might not be as appealing to godwit families, as it used to be.

After the first mowing events, which took place only after the 1<sup>st</sup> of June to not endanger nests and young chicks, the short grass made the finding of fledglings a bit easier. However, catching was still a bit of a problem: young fledglings started flying away when we would approach them to pick them up.

In total we could ring 147 Black-tailed Godwit chicks, most of them still on the nest shortly after hatching, when catching was the easiest; 24 additional fledglings were caught and color ringed.

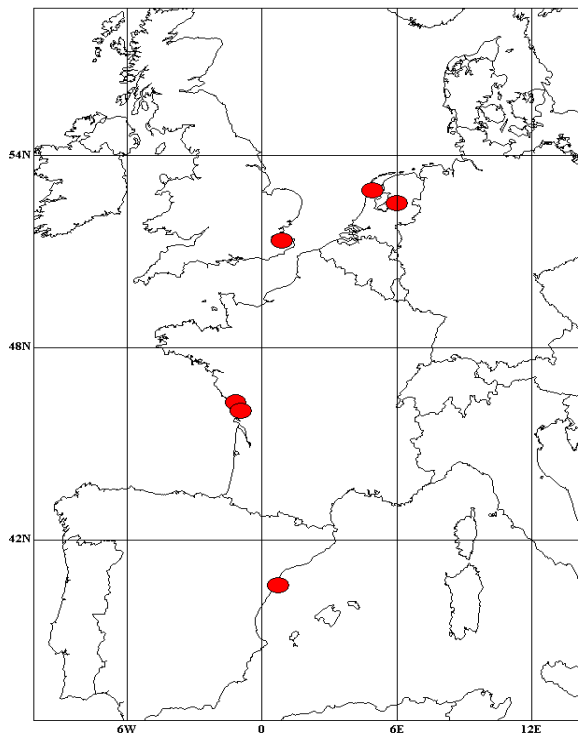
## Ringed birds 2004

total: 214



### After the breeding season

The first big flocks of Black-tailed Godwits (up to 700 ind.) appeared in late May and beginning of June. Later, the big flocks could be found on freshly mowed meadows. To assume that all these birds would be unsuccessful breeders is obviously wrong: we made resightings of single parents of a pair which would still have some chicks. This indicates that parents share their duties and do sometimes forage up to one kilometer away from their young.



Another abnormality of this breeding season was that the birds disappeared quite quickly after breeding. Usually, they would stay up to July before starting migration, but in 2004 they left The Netherlands by the end of June. This might have been due to the draught, too.

However, some resightings reached us during the migration period. The most interesting one might be the one in Great Britain, as we would not expect the nominal race to go there. This might also be mediated by the unusual summer climate. Only two resightings came from The Netherlands itself, this is striking as we did not expect the birds to prepare for the big jump south outside our country. The winter will be spent in West-Africa, where we do not expect a lot of resightings. But as soon as the birds start migrating north again, we might get

information about our birds again. And from there on, it will not be long until they will be back in their breeding area again.

#### **Future.....**

Individual differences in traits correlated with individual reproductive success might allow us to come to conclusions of the causation of the low reproduction rates thus population dynamics. Our data suggest a strong influence of individual timing of breeding on reproductive success. Early egg laying Black-tailed Godwits were heavier, had heavier eggs with a higher probability to hatch. They produced heavier chicks with higher growth rates. The positive effect of timing of breeding on reproductive success is well known, and the consistency of our data is very impressive. So if it is so beneficial, why do not all Black-tailed Godwits breed early? Our results come from a high quality habitat, with a low or partly even no agricultural activities and extremely low predation pressure during breeding season. If we do not detect sustainable reproduction rates here, we expect it to be even worse in areas with a higher agricultural impact. The actual ultimate causes for the low reproduction rates still remain unknown. Possible constraints for early egg laying should be found during the breeding season, but some studies refer to a possible high mortality during migration and wintering periods, too. To take actions for a better conservation of the Black-tailed Godwit in The Netherlands, a better knowledge about processes of the population dynamics and their causes is urgently required.

In the future, we will concentrate on the following questions:

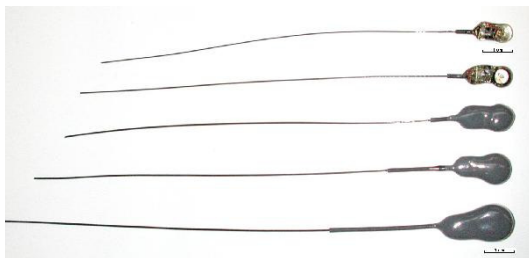
1.) What are the constraints for an early breeding, and where do they occur?

We look at individual differences on the breeding grounds but also on staging areas and during migration to determine possible causes for individual timing. Individual colour rings are the best tool to follow individual birds. Not only we are able to follow them, but we also rely on a huge community of hobbyist ornithologists, that might report us resightings of our birds from different locations all over the world. Additionally, we would like to use geo locators. These are small transmitters on the back or at the leg of a bird. The transmitters are not bigger than a color ring, thus they do not hinder a bird's life. They report and save the day length of every day and, with the help of an internal clock, we can determine the latitude, and under determined circumstances even the longitude of the place where the bird stays. These are a nice alternative to GPS transmitters, which are still too big, too heavy and too expensive. This method would give us an even better insight in the detailed timing of migration of the Black-tailed Godwit.

Further, we carry on with our work on the breeding grounds and want to start a small project on a staging area in southern Spain.

2.) What are the individual benefits of early breeding in the Black-tailed Godwits?

Arrival date and breeding date are very good and well-known indicators of reproductive success. We want to determine the individual advantages of different timing strategies. What exactly does a bird gain from arriving early on the breeding grounds? And why is this so? We want to look at a diverse set of traits that we expect to be correlated with reproductive success or



timing, respectively. Determining fledging success proved to be a difficult task. To get over this, we intend to use radio transmitters in the following years. With the help of radio transmitters attached to adults, we would be able to follow all families and determine fledging success more precise.

### 3.) What are the consequences on population dynamics?

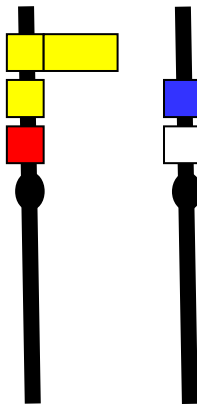
With the help of the results of the first two points, we hope to be in a position to draw conclusions on the impact on population dynamics of the Black-tailed Godwit. With detailed knowledge on the part-taking processes, we will be able to find reasons for the strong population decline of the Black-tailed Godwit in the last 20 years.

Next to answering the above stated questions, we hope that our project also sheds some light on the migration routes of the nominal race of the Black-tailed Godwit (*Limosa l. limosa*). This project will be carried out at least for the next consecutive six years. During these, we additionally would like to extend our study area to a wider range of places to get a better insight in dispersal patterns, too. This species is expected to be highly philopatric., The knowledge, to which extent dispersal takes place might be very informative for decisions on the announcement of protected areas and nature reserves.

To reach all these goals within the next 6 years, we are dependent on a huge community of volunteers, hobbyist ornithologists, students and many more. Each of them contributes a small, but still vital part to the study.

With this newsletter, we want to say "Thank You very much" for your contribution and effort.

Jos Hooijmeijer  
Julia Schröder  
Christiaan Both  
Theunis Piersma



### Colour ring scheme Black-tailed Godwit

Colour rings and flag: red, yellow, blue and white

The metal ring is not part of our code.

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