



Fieldwork and training for monitoring fish bio-diversity along the coast of West Africa using seabirds as indicators

Report from a training course in The Gambia, 11 - 14 May 2004

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Introduction

The project "Fieldwork and training for monitoring fish bio-diversity along the coast of Northwest Africa using seabirds as indicators" aims at the establishment of a monitoring network in all large seabird colonies in Mauritania, Senegal and The Gambia. On the one hand, the information to be obtained in the colonies will be used for getting an insight in the population development of the birds and their reproductive success. On the other hand, the birds will be used as indicators of fish availability in the colony neighbourhood.

The project will focus on the Grey-headed Gull, Slender-billed Gull, Royal Tern, and Caspian Tern. Breeding parameters, such as colony size, clutch size, egg size, and chick growth will be used as indicators of food availability in general. Analyses of regurgitated pellets and faeces will be used for determining the species composition of fish eaten by the birds.

The Bijol Islands off the coast of The Gambia are an important breeding site for a number of bird species included in the monitoring project, such as Grey-headed Gull, Royal Tern and Caspian Tern. The number of breeding Royal Terns may even amount to about 20% of the breeding population of the West African sub-species *Sterna maxima albidorsalis*. Therefore, it is regarded of great importance that the Bijol Islands are included in the project.

In 2003 a training course was organised for personnel of the Department of Parks and Wildlife Management, The Gambia, focussing on the collection of data in the field. In 2004 a second training was given. This report describes the results of this second training organised in co-operation with the DPWM. The training took place from 11 to 15 May at Abuko (Park Headquarters) and the Bijol Islands (Tanji Bird Reserve). From the side of the park training activities were co-ordinated by Kawsu Jammeh. The training was given by Jan Veen (VEDA consultancy), together with Hanneke Dallmeijer (VEDA consultancy) and Wim Mullié (ornithologist at Dakar). The following persons participated in the training:

- Saikou BARROW
- Lamin CEESAY
- Mansata COLLEY
- Bakary DRAMMEH
- Dembo GASSAMA
- Kawsu JAMMEH
- Basiru JASSEY
- Lamin MANNEH
- Jerreh NJIE
- Lamin SANYANG

Lamin CEESAY, Jerreh NJIE and Lamin SANYANG also participated in the 2003 training. All others took part in the training activities for the first time.

The training programme is summarised in the table below.

Date	Place	Activities
10/5	Saloum- The Gambia	Arrival of trainers in The Gambia
11/5	The Gambia	Meetings with park staff, discussion of training programme, preparations
12/5	The Gambia	Indoor training: background and content of project, methods and techniques
13/5	The Gambia	Indoor training: background and content of project, methods and techniques
14/5	The Gambia	Training in the field (Bijol Islands): <ul style="list-style-type: none"> - counting/estimating the number of breeding birds - GPS measurements of island and Royal Tern colonies - measuring clutch size - measuring egg size - collecting pellets and faeces
15/5	The Gambia- Kafountine	Analysis of data collected in the field, evaluation of training results, discussion of future monitoring, making of site plan

Training goal and contents

In the framework of this project, staff of the organisations is trained that are involved in management of large seabird colonies in Mauritania, Senegal and The Gambia. The ultimate goal is to establish a monitoring system, which can be carried out by the managing organisations. At each site, two training courses will be given, the second one building on the first. However, seven out of ten participants of this second training in The Gambia did not take part in the first. Therefore, the training programme was a combination of repeating theory, methods and techniques trained in 2003 and providing new information. During the training the following publications were used (report 1 and 2 were given to all participants):

1. J. Veen, J. Peeters & W.C. Mullié 2004: Manual for monitoring seabird colonies in West Africa
2. J. Veen, H.J. Dallmeijer & V. Wagner 2004: Alimentation d'oiseaux marins sur le littoral de l'Afrique de l'Ouest en 2003
3. J. Veen, J. Peeters, M.F. Leopold, C.J.G. van Damme & T. Veen 2002. Les oiseaux piscivores comme indicateurs de la qualité de l'environnement marin: suivi des effets de la pêche littorale en Afrique du Nord-Ouest.

Indoor training at Abuko

On 12, 13 and 15 May the participants were trained at DPWM headquarters in Abuko. The following subjects were dealt with (for details see the monitoring manual provided to all participants):

- Nature and background of the monitoring project (fisheries problems in West Africa).
- Goal of the project (developing a monitoring programme which aims at collecting data on the population development of fish-eating seabirds, and their food, in a standardised way).
- Seabird colonies along the West-African coast in relation to fish abundance (upwellings).
- How breeding parameters can be used as an indication of food availability.
- How the food composition of fish-eating birds can be determined by analysing regurgitated pellets and faeces.
- A code of conduct for researchers working in seabird colonies (how to behave in order to minimise disturbance).
- Methods and techniques for counting and estimating the number of breeding birds.
- How to calculate total breeding population size, based on monthly counts in the colonies.
- Measuring the number of nests in a colony with a GPS (measuring the surface area of a colony, measuring mean nest density and calculating total number of nests).

- Measuring clutch size (practical exercise in artificial colony).
- Measuring egg size (measuring length and width of chicken eggs with vernier calipers).
- Methods for collecting regurgitated pellets and faeces.
- Basic rules for administrating and analysing field data and for writing a comprehensive report.

Results

The course participants were enthusiastic and eager to learn. There were many questions which led to interesting discussions. The level of education and experience with basic research techniques varied considerably. Working with vernier calipers appeared to be difficult for most group members and only few reached a level of experience necessary for quickly working in the field situation. Many course participants appeared to have previous experience with respect to counting and estimating groups of birds.

Training in the field

It was planned to do fieldwork on two or three days. However, on two consecutive days the Bijol Islands could not be reached because of bad weather and technical problems with an outboard motor. On 14 May, under excellent weather conditions, the field training was carried out. The following activities were undertaken (see table below):

Activity	Grey-headed Gull	Caspian Tern	Royal Tern
Number of pairs breeding			
- counting	+	+	+
- estimating			+
- calculation based on GPS measurements			+
Clutch size	+	+	+
Egg size			+
Collection of pellets		+	+
Collection of faeces		+	+

No attempt was made to determine chick condition, which is an important breeding parameter to be measured. In this respect it should be noted that the Bijol islands are very small, whereas large numbers of breeding birds nest in the area. In the course of the season the chicks of Caspian Terns and especially Royal Terns tend to leave the colony area concentrating in crèches. In the past it has been found that such chicks tend to react to approaching humans by entering the sea. As there are currents around the islands this introduces the danger that chicks get lost. For this reason the measuring of chick condition has been skipped from the monitoring programme for the Bijol Islands.

Results of the training in the field

Course participants were highly motivated when doing fieldwork. Most of them were clearly experienced in estimating flocks of birds. The counting of the nests of the Grey-headed Gulls was carried out in a way which had been practised many times before. Counting nests was combined with making notes on clutch size. However, it should be noted that it is not necessary to establish clutch size at all times and for all nests. A representative sample taken at the "peak of laying" for each species as described in the manual will suffice (and will limit the time present in the colony and thus disturbance). As it was presumed that some course participants would not be able to quickly measure egg size, a number of Royal Tern nests

were marked and eggs were taken away to be measured outside the colony. After being measured all eggs were returned to the nests at the same time, thus minimising disturbance. Eggs were measured accurately, but using vernier calipers should be thoroughly trained in the office next year before measuring eggs in the field again.

Field data collected

Map of the islands

A map of the island was made by Wim Mullié, using data obtained by GPS, on 14 May 2004. Features which were included are as follows: high tide line, low tide line, vegetated parts of Big Island (see Fig. 1).

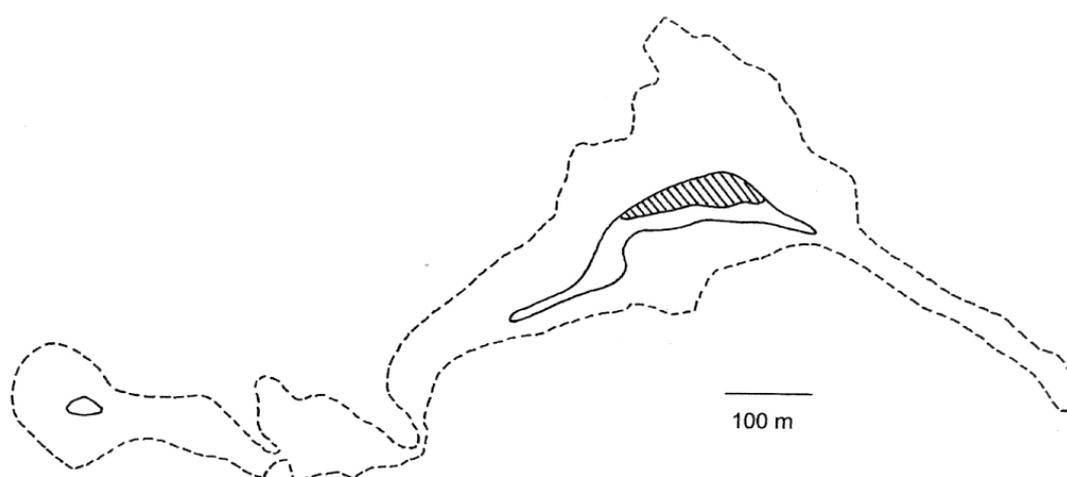


Figure 1. Map of the Bijol Islands showing the low tide line (broken line), high tide line (solid line) and the vegetated area (hatched) .

Grey-headed Gull

- The Grey-headed Gulls nest in the vegetation covering the central part of the Big Island. The area occupied for breeding is similar to the situation in 2003. The birds are in different stages of the breeding cycle. There are nests with eggs and small chicks as well as many chicks of different ages (including fledglings) that wander around. Breeding appears to have started in the central and western part of the colony, where most nests are now abandoned. In the eastern part nests with eggs and small chicks are found and a census is made (participants of training walk in line through colony, thus counting all nests in one go). Altogether 229 nests with eggs are counted. In parts of the colony where many nests are abandoned, several one-egg clutches are found. Considering the state of these nests (old, dirty), it is assumed that most of these eggs have been deserted by the adults because they were infertile or rotten. For some this is confirmed by gently shaking the eggs.
- Information on clutch size is collected along with the nest census. In 229 nests 509 eggs are counted, mean clutch size being $509/229 = 2,22$ eggs/nest.
- Egg size is not measured because of time shortage.

Royal Tern

- On Lighthouse Island there are two concentrations of nests east and west of the lighthouse which all contain eggs. There are several non-incubating birds present on the island and it is believed that this colony is still in a phase of development. Within about five minutes all 1375 nests are counted. On Big Island there is one large breeding colony, situated on the beach and bordering the vegetation on the south-eastern part of the island. There are small chicks present in roughly 20%-30% of the nests. The number of nests (in fact birds sitting on nests) is estimated by 7 participants, the mean being 8640 nests (range 7,000-12,000). Because there are many small chicks, the nests cannot be counted. Instead, the colony circumference is measured with GPS. After the training the GPS data are plotted by the participants on graph paper and the surface area is calculated to be 1875 m². Nest density is measured by counting the number of intact nests in three 2x2 meter squares giving the following result: 32+31+32 = 95:12 = 7.92 nests/m². The number of nests is calculated as follows: 1875 m² x 7.92 = 14,850 nests. However, there were several small Caspian Tern colonies present within the large colony of the Royal Terns. For this reason, colony surface area may have been slightly over-estimated and the figure is rounded at 14,000. There are no medium-sized or large chicks present on the island and it is concluded that there have been no Royal Tern colonies on the island which have already been left by parents and chicks (compare 2003 situation in report of that year). The GPS method is considered to be more reliable than the estimation of nests made by the participants. Therefore, the breeding population is calculated as to contain 1375+14,000= 15,375 pairs.
- Clutch size is determined as to be 1,03 eggs/nest (117 nests with 121 eggs).
- Mean length and width of eggs appears to be 60,8 x 41.1 mm (n=24).
- 50 pellets and 10 faeces samples (each containing faeces from around a few neighbouring nests) are collected in the colony on Big Island.

Caspian Tern

- There are two small colonies on Lighthouse island (36 nests) and a number of colonies varying in size from a few to 51 nests on Big Island. All Caspian Tern colonies are situated at the border or within the much larger Royal Tern colonies. The total number of nests is 127, all containing eggs or small chicks. Furthermore, about 15 large chicks (up to four weeks of age) are seen along the beach. The latter are excluded from the count and the number of breeding pairs present is determined to be 127 pairs.
- Clutch size is measured at 1,62 eggs/nest (87 nests in which 141 eggs are counted)
- Eggs are not measured because of time shortage.
- 50 pellets and 10 faeces samples (each containing faeces from around a number of nests) are collected.

Summary of the data collected

The number of breeding birds (pairs) on the Bijol islands on 14 May 2004		
Species	Number of nests and/or number of incubating birds	remarks
Grey-headed Gull	229	Number of nests with eggs or small chicks (a few days old only)
Royal Tern	15,375	Nests counted and estimate based on GPS measurements
Caspian Tern	127	Number of nests with eggs or small chicks (a few days old only)

Summary of clutch size data							
Species	Number of eggs in nest				Number of nests	Number of eggs	Eggs/nest mean
	1	2	3	4			
Grey-headed Gull	53	73	102	1	229	509	2.22
Royal Tern	113	4	0	0	117	121	1.03
Caspian Tern	35	50	2	0	87	141	1.62

Evaluation and conclusions

When dealing with the results of the training it has been emphasised that there were major differences in the level of experience of the course participants. Some of them, however, appeared to be able to quickly and accurately carry out all monitoring activities. A number of DPWM staff, who showed to be experienced in monitoring techniques during the 2003 training, did not participate in the 2004 training. Therefore, it is concluded that there is a sufficiently large number of persons within DPWM to carry out the monitoring programme in an efficient way.

This report deals only with a census of the breeding birds nesting on the Bijol Islands on 14 May. DPWM staff has made additional counts of the breeding on the Bijol Islands on 18 February, 24 March, 24 June, 24 July and possibly in August. At the time of making this report only part of the data are available. This makes it impossible to make a reconstruction of the total breeding population of the various species for the 2004 season as was done in the 2003 training report. Such a reconstruction should be made at a later stage.