

*Biologia Gallo-hellenica*, vol. 22, pp. 171-178, 1994

5e CONGRÈS INTERNATIONAL SUR LA ZOOGÉOGRAPHY ET L'ÉCOLOGIE DE  
LA GRÈCE ET DES RÉGIONS AVOISINANTES - Iraklion, Avril 1990

## **THE BREEDING STATUS OF THE GULL-BILLED TERN (*GELOCHELIDON NILOTICA*) IN WESTERN GREECE**

by P. PERGANTIS<sup>1</sup>, V. GOUTNER<sup>2</sup>, G. HANDRINOS<sup>3</sup> & T. AKRIOTIS<sup>4</sup>

### Introduction

The Gull-billed Tern, *Gelochelidon nilotica*, is not only one of the least common species of tern in Greece as well as in the rest of Europe but it has also showed a marked decline in many areas in the last decades (HANDRINOS, 1992). Such a decline has been basically attributed to extensive changes in the habitats of the species (MÖLLER, 1975). Preferred habitats are lowland coasts, estuaries, river deltas, lagoons but also inland lakes, rivers and marshes, as for example the Mountain lakes of Armenia at c. 2000 m (DEMENTEV & GLADKOV, 1951, CRAMP, 1985). Throughout Europe, the habitats favoured by the species are unfortunately among those which have been very extensively altered since the middle part of this century, when very intense development of agriculture occurred and involved, in particular, extensive drainage schemes.

In Greece, the drainage of extensive marshlands such as those of the Evros Delta and of the Mccsolonghi Lagoon, has resulted in the marked decline of the Gull-billed Tern (BRITTON 1979, C. VAGLIANO pers. comm.). The present Greek population is estimated at 200 pairs, in 5 colonies and for this reason the species has been classified as "vulnerable" in the Red Data Book of Greece (HANDRINOS, 1992). It has also been included in the Annex 1 list of the 79/409/EC Directive "on the protection of wild birds", which lists those bird species which should be strictly protected.

This study aims at giving an up-to-date picture of the breeding status of the Gull-billed Tern in western Greece, as part of the results of the regular survey of breeding birds in all the major wetlands of western Greece, recently begun by the authors of this paper. The Gull-billed Tern was selected as a target species because it is vulnerable, and thus in need of special attention, but also because it could be used as an index-species of ecosystem integrity and in particular of the presence of marshland and of the intensity of pesticide

use on fields bordering wetlands. This latter reason stems from the fact that this species tends to forage at the margins of wetlands rather than in their main part and its diet is in many areas composed mainly of insects (CRAMP, 1985) which in their turn are susceptible to intensive agricultural methods.

#### Study methods and areas covered

The wetland areas surveyed are shown on Fig. 1 and the periods of observations appear in Table 1.

Table 1. Areas covered and conservation periods of 1989 survey.

Area	Period of Observations
Amvrakikos	June 11-15, June 28-30, July 1-2
Messolonghi	June 7-11
Kalamas Delta	June 15-17

The areas surveyed were covered as thoroughly as possible and we believe that no possible tern colony was left undetected, even though certain sites were inaccessible and thus only surveyed from a distance with the aid of telescopes. Colonies of breeding terns were generally easy to spot due to the activity of the birds over and around them, as well as by following birds carrying food. The number of pairs was first estimated by counting the number of individuals sitting at an incubation-like posture within the colony. This provided a first figure of the colony size. A second figure was obtained as follows: The total number of individuals (both sitting as well as flying around), was also counted and then was divided by two. If the second figure obtained, corresponded to a larger number of pairs, then this was taken as the estimate of colony size. This may have overestimated colony size by including non-breeding individuals at the colony but on the other hand corrects for those nests which were not visible from a distance.

Pellets of regurgitated food material were collected at the Messolonghi colony.

#### Results

In the Amvrakikos area, there were two sites where big groups of individuals were observed. The main colony (70-85 pairs) was situated on a

sand-bank, together with a few pairs of Sandwich Terns, *Sterna sandvicensis*, and hundreds of pairs of Common Terns, *S. hirundo* (see AKRIOTIS & PERGANTIS, this volume).

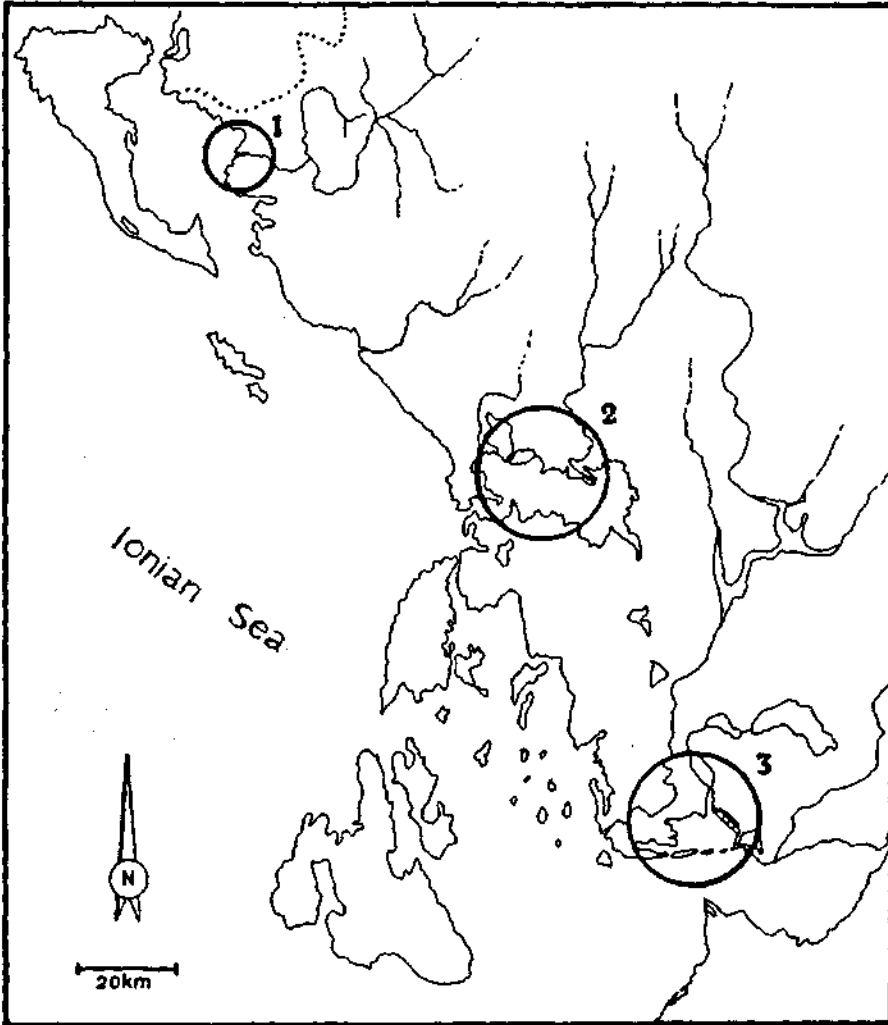


Fig. 1. Map of western Greece showing main study areas in 1989.

- 1 = Kalamas Delta
- 2 = Ainvrakikos
- 3 = Messolonghi

In the Messolonghi Lagoon area, there were 83 nests on a dike found in the Messolonghi saltworks. The composition of the sample of pellets collected at this colony is shown in Fig. 2. It can be seen that the sample is largely composed of crustaceans and insects, though it should be born in mind that pellet composition is not necessarily representative of diet since certain food types (e.g. Crustacea) may be more obvious and leave larger quantities of undigested material than others. Nevertheless, the predominantly insectivorous diet of this species in other parts of its range (CRAMP, 1985) is confirmed.

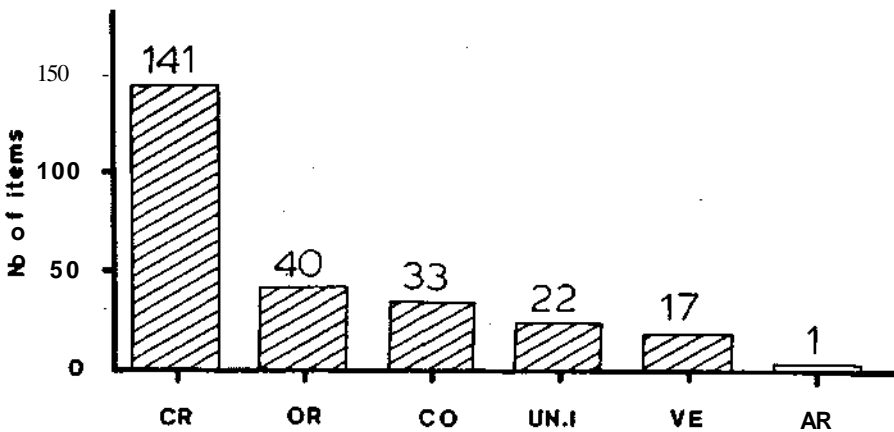


Fig. 2. Composition by number of pellet material from Messolonghi colony of Gull-billed Tern:

CR = Crustacea  
 OR = Orthoptera  
 CO = Coleoptera  
 UN.I = Unidentified Insecta  
 VE = Vertebrata  
 AR = Arachnida

In the Kalamas Delta 6 individuals were observed without any sign of breeding, although there is still suitable habitat for the species in the area. Some of the fish farm constructions that have been constructed in the past, appeared to be abandoned in 1989 and are gradually reverting to a more natural state. Nevertheless, there seems to exist very little nesting habitat, such as undisturbed islands, mainly due to disturbance by large numbers of cattle in the area.

## Discussion

A comparison of the present situation with that in the past (Table 2) shows that there appear to have been some marked changes in the population level of the species.

Table 2. Changes in status of the Gull-billed Tern in western Greece in the last 20 years.

	Year	Population	Source
Kalamas Delta	1989	6 individuals, no breeding	This study
Amvrakikos	1978	Some flying individuals	MAKATSCH (1979)
	1980	10 birds seen in flock	SZIJJ (1981)
	1989	70-85 pairs	This study
Messolonghi	1858	Large numbers	SIMPSON (1860)
	1966	300 pairs	WOLFF (1966)
	1978	No record of breeding	BRITTON (1979)
	1989	Minimum 83 pairs	This study

Note: No published data on past populations in the Kalamas Delta exist.

Kalamas Delta: No published data of the former breeding status of the species appear to exist.

Amvrakikos: None of the past surveys (MAKATSCH, 1979) recorded breeding, although small numbers of birds had been seen and breeding was considered probable.

The Essen University team (SZIJJ, 1981) made a very thorough survey around the sites of both of the main colonies. Thus, the results of older surveys show that it is possible that breeding colonies of this species have only recently become established in the Amvrakikos area, at least within the last decade.

Messolonghi: The breeding colony found by WOLFF (1966) was considered to be the largest in Greece (approx. 300 pairs). Other records coming from less complete surveys later on, include 9 birds seen with one juvenile in 1980 (AKRIOTIS, unpublished) and 20 adults together with 11 juveniles in 1984 (PERGANTIS, 1986), with feeding of the young birds observed in both cases. The record of the present survey is at least 83 breeding pairs. Thus, the species appears to have declined very seriously after 1967 and to have made a recovery in the last decade.

Some of the changes in its observed population could well be caused by natural factors to a certain extent. We know that in other parts of the world too, populations of this species have been found to fluctuate widely (CRAMP,

1985). However, at least in Messolonghi, the decline of the population of the Gull-billed Tern appears to have occurred during a period of extensive habitat alterations in the form of extensive drainage operations and saltvork expansion that took place in the late 1960's and in the early 1970's. Ironically, the species now breeds exclusively within the area of the saltworks, although almost all of its foraging takes place outside this area in brackish or less saline habitats. From our experience we can conclude that their breeding ground preference is certainly due to the virtual absence of human disturbance within the saltworks area during the breeding season. Therefore, it can be said that, apart from the requirement for a suitable feeding habitat, the species also needs undisturbed breeding sites. This could be a limiting factor in certain cases, such as in the Kalamas Delta.

Since the Gull-billed Tern is one of the most vulnerable bird species in Greece as well as in Europe as a whole, it needs the special attention of those involved in conservation. The measures that we believe need to be taken in the three areas that we surveyed include:

1. In the Amvrakikos area, wardening of the breeding sites on a regular basis. This should be combined with educational work aimed especially at fishermen, who are the main cause of disturbance during the breeding season, so that unnecessary disturbance can be avoided. Wardening could usefully be extended to include the breeding sites of many other bird species in the area, some of which are very important (e.g., AKRIOTIS & PERGANTIS, this volume, PERGANTIS, this volume).

2. At Messolonghi, it is advisable that conservation authorities should cooperate with the saltworks company to assure a suitable management plan for the existing nesting sites.

3. Further study of the situation at the Kalamas Delta.

4. In all areas, the foraging grounds of the species need firstly to be identified and secondly to be protected from adverse human activities. Where this includes agricultural land, special rules to control pesticide use should apply through appropriate measures that will take the needs of local farmers into account.

5. Legislation for the protection of the breeding areas from any further destruction of natural habitat.

In all areas it is necessary to continue the monitoring of all populations to see if further expansion or population increase is taking place, as well as to identify any decline in its early stages.

#### Acknowledgments

Financial support for this work was in part provided by the Amvrakikos

Development Company (ETANAM) as part of its project for the monitoring of bird populations in the Amvrakikos area. We should like to thank G. Kondylis, Y. Roussopoulos and Y. Loukas for valuable assistance in the field.

### Abstract

The breeding population of the Gull-billed Tern was surveyed in western Greece 1989. Three colonies were found, two at the Amvrakikos area and one at Messolonghi. All of these colonies appear to have become established in approximately the last decade, after a decline that occurred rather in the late 60's and early 70's. The diet of the species appears to be composed largely of crustaceans and insects in Greece as it is in other parts of the world. Limiting factors of the population appear to be loss of marshland habitat and the availability of undisturbed nesting places. Proposals for the conservation of the species are made.

### Περίληψη

Το 1989 έγινε καταγραφή του αναπαραγόμενου πληθυσμού του Γελογλάρου στη δυτική Ελλάδα. Βρέθηκαν τρεις αποικίες, δύο στην περιοχή του Αμβρακικού και μία στο Μεσσολόγγι. Φαίνεται πως όλες οι αποικίες αναπτύχθηκαν κατά την τελευταία δεκαετία περίπου, μετά από μείωση του πληθυσμού που συνέβη περί τα τέλη της δεκαετίας του 1960 και αρχές τις δεκαετίας του 1970. Το διαιτολόγιο του είδους δείχνει να αποτελείται κυρίως από καρκινοειδή και έντομα στην Ελλάδα, όπως και σε άλλες περιοχές του κόσμου. Περιοριστικοί παράγοντες του πληθυσμού φαίνονται να είναι η απώλεια ελωδών εκτάσεων και η διαθεσιμότητα ανενόχλητων περιοχών φωλιάσματος. Περιλαμβάνονται προτάσεις για την προστασία του είδους.

### REFERENCES

- BRITTON R., 1979.- *Environmental impact of proposed new salinas at Messolonghion*. (Unpubl. report). Station biologique de la Tour du Valat and Ministry of Coordination, Athens.
- COUNCIL OF THE EUROPEAN COMMUNITIES, 1979.- *On the conservation of wild birds*. Directive 79/409/EC, O.J./EC.V.22: 1-18.

- CRAMP S. (cd.), 1985.- *The birds of the western Palearctic*. Vol. 4. Oxford University Press. Oxford.
- DEMENTEV G.P. & GLADKOV N.A. (eds.), 1951.- *The birds of the Soviet Union*, Vol. 3. Jerusalem.
- HANDRINOS G., 1992.- Gull-billed Tern *Gelochetidon nilotica*. In: M. Karandinos (ed.), *Red data book of threatened vertebrates of Greece*. Hellenic Zoological Society, Athens, pp. 188-190. (in Greek).
- MAKATSCH W., 1979.- Ornithologische Beobachtungen in Griechenland. *Physis* 19/20: 55-76
- MÖLLER A.P., 1975.- The breeding population of Gull-billed Terns in 1972 in Europe, Africa and western Asia. *Dansk orn.Foren.Tidsskr.* 69: 1-8.
- PERGANTIS P., 1986.- Indications of nesting recovery of terns and waders in Messolonghi. *Newsl.hellen.orn.Soc.* 3: 18.
- SIMPSON W., 1860.- Ornithological notes from Messolonghi and south Aetolia. *Ibis* 2: 279-296.
- SZIJJ J.,(ed.), 1981.- *Ökologische Wertanalyse der Mundungsgebiete der Fliisse Louros und Arachthos am Anivrakischen Golf*. 2 volumes. (Unpubl. report). Essen Univ.
- SZIJJ J., (ed.), 1983.- *Ökologische Wertanalyse des Acheloos-Deltas (Westgriechenland)*. (Unpubl. report). Essen Univ.
- WOLFF W.J., 1966.- Spring and summer observations from Messolonghion, Greece. *Ardea* 54: 67-75.

1. *Wetland Research - Monitoring - Consultancy*  
304 00 Aitoliko  
Greece
2. *Lab. of Zoology*  
*Dept. of Biology*  
*Aristotelian Univ. of Thessaloniki*  
540 06 Thessaloniki  
Greece
3. *Game Management Dept.*  
*Ministry of Agriculture*  
*Ippocratous 3-5*  
101 64 Athens  
Greece
4. *Dept. of Environmental Science*  
*Univ. of the Aegean, Lesvos*  
Greece