On the breeding of Kentish *Charadrius alexandrinus* and Little Ringed Plovers *C. dubius* in the Lower Tiligul Liman, south-western Ukraine

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Sporadic historical records of Kentish *Charadrius alexandrinus* and Little Ringed Plovers C. dubius in the Lower Tiligul Liman are reviewed. Recent interest in studies of Kentish and Little Ringed Plovers is a consequence of their listing in the Ukrainian Red Data Book. Breeding of Little Ringed Plover in the liman was confirmed for the first time only in 1986, although before then it had been regularly observed in the breeding season. Since 1986 both species have been found regularly within colonies of terns. Monitoring occurred between 1986-1991. Most breeding pairs in both species of plovers was recorded in 1990: 80 nests of Kentish Plover and 15 nests of Little Ringed Plover. Breeding success of the two species is remains rather low but stable. An example of an embryonic abnormality is reported that is probably pollution-related.

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Стойловский, В. П., Кивганов, Д. А. 1998. О гнездовании морского *Charadrius alexandrinus* и малого *C. dubius* зуйков в Нижнем Тилигульском лимане, на юго-западной Украине. *International Wader Studies* 10: 252-255.

Приведен обзор спорадических исторических регистраций морского *Charadrius alexandrinus* и малого *C. dubius* зуйков в Нижнем Тилигульском лимане. Заинтересованность за последнее время в изучении морского и малого зуйков следует из того, что оба вида занесены в Красную книгу Украины. Гнездование малого зуйка впервые было доказано только в 1986 г., хотя вид до этого регулярно наблюдался в гнездовой период. Начиная с 1986 г. оба вида постоянно регистрируются внутри колоний крачек. Мониторинг проводился в период с 1986 по 1991 г. Максимальная численность гнездящихся пар обоих видов была зарегистрирована в 1990 г. : 80 гнезд морского и 15 гнезд малого зуйков. Успех размножения остается стабильным, но на сравнительно низком уровне. В статье сообщается о примере зародышевой ненормальности, связанной, наверное, с загрязнением окружающей среды.

Introduction

The first data on breeding by Kentish Plover *Charadrius alexandrinus* and Little Ringed Plover *C. dubius* in the north-west Black Sea region were published by Brauner (1923), Nazarenko (1959), and Puzanov (1962). These birds were considered as regular but not very common breeders, in spite of the availability of suitable habitats. Recent information on the ecology and behaviour in these species is available from studies which were started in the early 1970s at the lower Tiligul liman by I. Chernichko. A seasonal ornithological research station has been established there for the last 20 years. More recent interest in studies of Kentish and Little Ringed Plovers is a consequence of their listing in the Ukrainian Red Data Book.

The Tiligul liman is one of several shallow coastal lagoons formed by regular flooding of the Tiligul river mouth by sea-water. At present, the liman is separated from the Black Sea by a bar which appeared as a result of accumulation processes and is connected with the sea only through an artificially constructed and regulated canal (Figure 1).

The lower Tiligul liman area belongs to the Odessa-Kherson geobotanical district of xerophylic forb-grass steppes. The vegetation present is dominated by Sheep's Fescue *Festuca sulcata*, Spurge *Euphorbia* spp., and Koeleria Koeleria spp. associations, which are influenced by grazing. As a consequence, the grassland is very tussocky. Regular changes in the

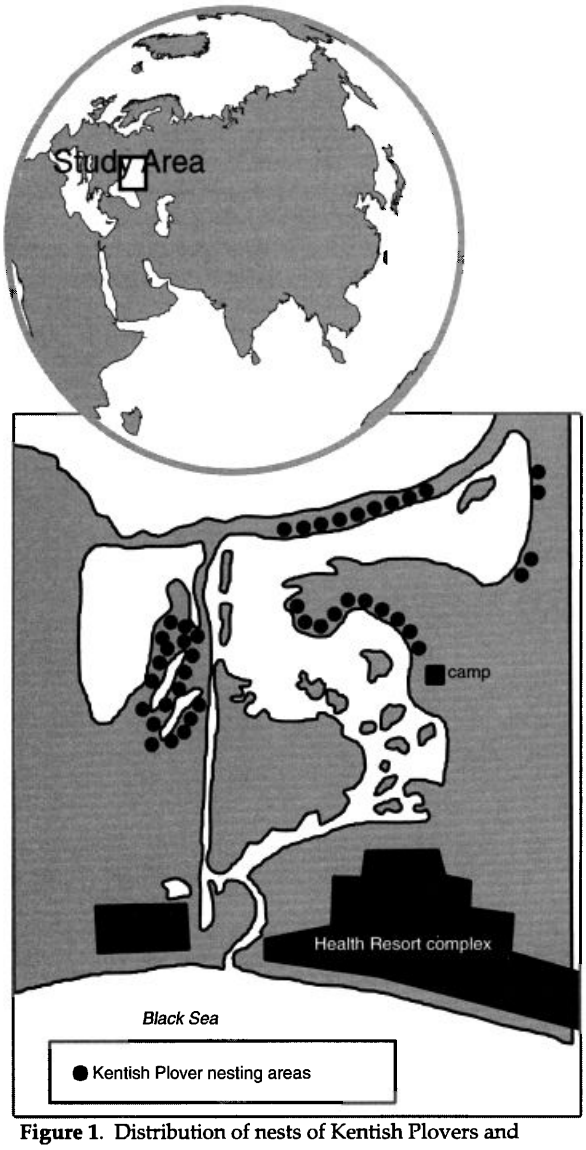

Figure 1. Distribution of nests of Kentish Plovers and Little Ringed Plovers through the study area of the lower Tiligul liman.

hydrological regime at the lower part of the liman and the periodic flooding of numerous sandflats and islets favour the formation of suitable habitats for plover breeding.

Results

Between 1986-1991 the highest number of breeding pairs in both species of plovers was recorded in 1990: 80 nests of Kentish Plover and 15 nests of Little Ringed Plover (Figure 2). This was connected with the rather low water level in the liman during 1990 (and also in 1991) that led to the appearance of numerous sandy areas which were suitable for breeding. Optimal conditions also occurred on the coastal sandflats of the islets, where breeding plovers were protected from ground predators by the water and from avian predators by nearby colonies of terns Sterna spp. The colonisation of many sandflats with dense vegetation has made them less suitable for breeding plovers and this has led to a decline in their numbers, as happened in 1991.

Breeding of Little Ringed Plover in the lower Tiligul liman was confirmed for the first time only in 1986, although before then it had been regularly observed in the breeding season. Since 1986 both species have been found regularly within colonies of Little Tern *Sterna albifrons*, as well as in mixed colonies of Common *Sterna hirundo*, Gull-billed *Gelochelidon nilotica*, and Sandwich *Sterna sandvicensis* Terns, and Mediterranean *Larus melanocephalus* and Slender-billed *L. genei* Gulls. In such colonies, plovers select breeding locations with sparse vegetation and nests are always placed close to open areas. The formation of autonomous colonies by Kentish and Little Ringed Plovers at the Tiligul liman is exceptional. The obvious preference for breeding in mixed colonies is clearly connected to the benefits that accrue from the defence that larger and more aggressive neighbours give against predators.

Kentish Plovers arrive on the breeding grounds from late April, 7-10 days earlier than Little Ringed Plovers. The first Kentish Plover nests are usually found in early May, although new nests continue to be found until mid-July. Nests are distributed unevenly within the colony of the Kentish Plover, there is usually a core-area that can be distinguished with single nests located up to 15-20 m distant.

Using walk-in traps, we caught plovers either on their nests or when foraging: 25% of Kentish Plovers that are breeding in the lower Tiligul liman have been ringed. No statistically significant sexual differences were found in measurements of the Kentish Plovers (Table 1).

The numbers of plovers are influenced not only by the lack of suitable habitats for nesting, but also by the activities of egg-predators, such as Rooks *Corvus frugilegus*, Hooded Crows *Corvus cornix*, Gulls *Larus* spp., domestic dogs Canis familiaris, Hedgehogs *Erinaceus europaeus*, Foxes *Vulpes vulpes*, and Racoon Dogs *Nyctereutes proccyonoides*. This makes the study of breeding plovers rather difficult as these animals are able to find nests by following the tracks of observers.

Human activities of a different kind also probably influence the breeding success of plovers, for example, an abnormal embryo of a Kentish Plover with three additional toes on its left leg (Figure 3), was taken out from an abandoned egg, which is probably the result of chemical environmental pollution. We presume this is the cause because the nest was placed only 15 m from a road with a lot of traffic (in the northern breeding area of the species indicated in Figure 1). This specimen is now in the collection of the Zoology Department of Odessa University.

If nest-failure occurs, especially early in a season, plovers may relay. We recorded the evidence of two breeding cycles in a season for one Kentish Plover female which was trapped near the research station

Table 1. Measurements and weight of adult males (m) and females (f) of the Kentish Plover in the lower Tiligul liman, south-western Ukraine. D = dispersion.

Signs	Sex	n	Range	M+SE	D	CV(%)
Wing	f	37	106-117	111.6+0.49	8.94	2.68
	m	22	103-118	111.0+0.81	14.52	3.43
Tail	f	25	43.0-51.0	46.0+0.41	4.20	4.46
	m	12	44.0-48.0	46.1+0.33	1.35	2.52
Culmen	f	35	13.3-16.3	15.0+0.11	0.46	4.53
	m	19	13.8-16.5	15.0+0.17	0.53	4.86
Head+culmen	f	31	39.5-43.4	41.8+0.19	1.08	2.49
	m	17	40.2-43.5	41.8+0.23	0.88	2.25
Tarsus+toe	f	21	44.0-51.5	48.5+0.39	3.17	3.67
	m	10	45.6-51.0	48.5+0.56	3.17	3.67
Weight	f	10	36.0-49.0	42.7+1.23	15.2	9.13
	m	8	39.5-47.0	42.3+1.07	9.18	7.16

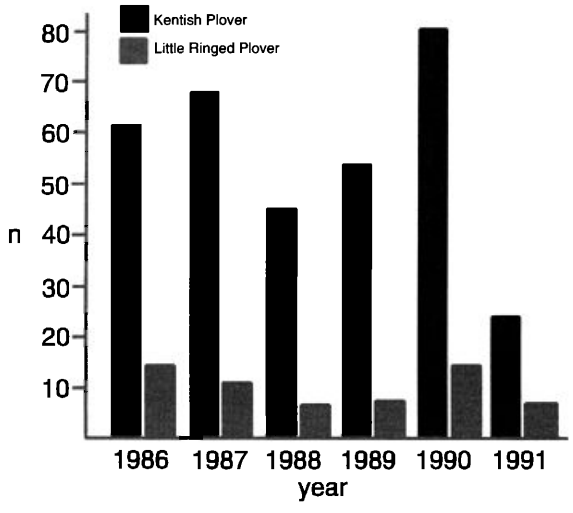

Figure 2. Numbers of Kentish Plover and Little Ringed Plover nests at the lower Tiligul liman in 1986-1991.

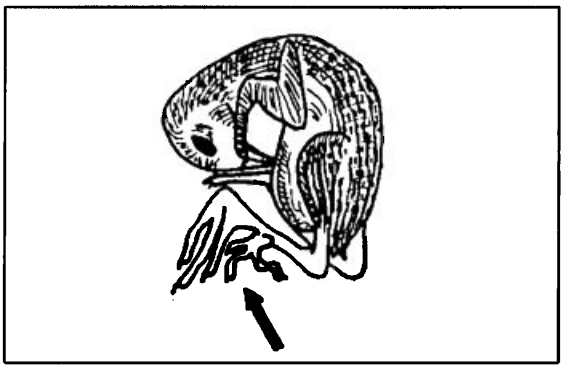

Figure 3. Abnormal embryo of Kentish Plover with three additional toes collected from abandoned egg at the lower Tiligul liman.

(Figure 1) on 29 April 1990 on a nest with three eggs. These chicks hatched successfully later and on 8 July this bird was caught on a small islet (No 4; Figure 1) where it was again incubating a complete clutch. Unfortunately, that clutch was abandoned for unknown reasons. The other pair-member was not trapped in either of the two nesting attempts, so we do not know whether the same male remained with the female, or if a new pair was formed for the second breeding attempt.

Our data shows that the breeding success of Kentish and Little Ringed Plovers remains rather low but stable. It is probable that rather low numbers are normal for these species in this part of their breeding ranges.

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