https://www.biodiversityjournal.com - Edizioni Danaus
Biodiversity Journal, 2024, 15 (3): 659–664 - **Article**
https://doi.org/10.31396/Biodiv.Jour.2024.15.3.659.664

Biodiversity Journal
ISSN 2039-0394 (Print Edition)
ISSN 2039-0408 (Online Edition)

Presence of *Caretta caretta* (Linnaeus, 1758) (Reptilia Cheloniidae) on Lampedusa island (Pelagie Islands, Sicily Channel): update on the 2022 and 2023 nesting seasons and on conservation measures

Elena Prazzi, Vincenzo Billeci, Giuseppe Maraventano, Gerry Sorrentino, Angelo Dimarca & Giulia Casamento

Legambiente Sicilia, Ente Gestore Riserva Naturale "Isola di Lampedusa", via Vittorio Emanuele 25, 92031 Lampedusa (Agrigento) Italy; email: lampedusa@legambienteriserve.it

ABSTRACT During 2022 and 2023 a total of 22 nests of *Caretta caretta* (Linnaeus, 1758) (Reptilia Cheloniidae) were laid on Lampedusa island. Ovipositions interested 5 different beaches of the island, with the discovery of two new oviposition sites (Cala Spugne and Portu Ntoni). The 16 nests monitored in 2023 represent the highest number of oviposition ever recorded in Lampedusa. For the first time on Lampedusa, nests laid in Cala Spugne and at high risk of inundation have been relocated to Conigli beach, within the Nature Reserve "Isola di Lampedusa". This practice, together with other conservation measures implemented on the beaches outside the protected area, permitted to protect nests and newborns in sites also affected by pressures connected with mass tourism. Otherwise, the strengthening of the use regulation on Conigli beach, with the introduction of a limit on number of visitors, has further increased the level of environmental protection, thus representing a model to be proposed on the other beaches of Lampedusa outside the Nature Reserve.

KEY WORDS *Caretta caretta*; sea turtle; nesting; conservation measures; Lampedusa.

Received 21.05.2024; accepted 26.08.2024; published online 30.09.2024

INTRODUCTION

Lampedusa island (Sicily Channel, Italy) is a well-known nesting site for *Caretta caretta* (Linnaeus, 1758) (Reptilia Cheloniidae) and nesting events have been observed on almost all the sandy beaches of the island. Among these, Conigli beach is one of the first Italian sites where the presence of *Caretta caretta* was monitored (Prazzi et al., 2010) and the regular presence of this species has now been established for over 35 years. Since 1996 the beach has belonged to the Nature Reserve "Isola di Lampedusa", established by Sicilian Region and managed by Legambiente Sicilia. Furthermore, the beach also falls within the Special Conservation Area ITA040002 "Islands of Lampedusa and Lampione", the Special Protection Area ITA040013 "Pelagie Archipelago - marine and terrestrial area", and the stretch of sea in front of Conigli beach falls in zone A of the Marine Protected Area "Pelagie Islands". On Conigli beach, over the years, the managing body of the Nature Reserve has carried out environmental recovery interventions aimed at stopping the phenomena of soil erosion which put the area at risk (Motta & Motta, 2007; La Mantia et al., 2012), as well as the adoption of conservation rules and measures that have allowed to offer forms of responsible tourism, protecting the habitats and species linked to this fragile site. *Caretta caretta* conservation actions have always been one of the

main objectives of the managing body of the reserve (Bombace et al., 2001; Prazzi et al., 2010) and over the years they have made it possible to increase the protection of the species. Thereby, it is important to collect data on the reproductive biology of *Caretta caretta*, to improve safeguard measures of nests and newborns, and to check the presence of nests on other Lampedusa beaches (Prazzi et al., 2013; Prazzi & Giacoma, 2018; Prazzi, 2022). This short note provides an update on the nesting activity of *Caretta caretta* on Lampedusa island which occurred in 2022 and 2023. The finding of nests in two new beaches on the island and the conservation measures implemented by Legambiente Sicilia as managing body of the Nature Reserve for the protection and safeguarding of nests and newborns are also reported.

MATERIAL AND METHODS

In the 2022 and 2023 summer seasons, monitoring of sea turtle nesting was carried out from the end of May to the end of August through morning patrols of the beaches of the island. During the surveys all adult female tracks were catalogued, and in presence of nest crawling tracks the egg chamber was located and subsequently all nest protection measures were implemented according to the Action Plan for the Conservation of *Caretta caretta* in the Pelagie Islands (Balletto, 2003), the Protocols for the protection of nests and assistance to hatching (Giacoma & Mari, 2003) and the Ministerial Guidelines (AA.VV., 2013). These measures included protection actions from both anthropogenic and natural threats. To avoid eggs predation, every nest was protected with a cage while, to mitigate impacts linked to the presence of tourists, an area of approximately 16 m^2 around the nest was fenced off (Fig. 1). Nests laid too close to the shore and thus at risk of inundation were relocated to other parts of the beach more suitable to ensure the hatching success. Eggs relocation was also carried out for nests laid in unfavorable substrates, such as those in the presence of plant roots. During incubation period the temperature trend of sand was monitored at two different depths (20 cm and 40 cm), positioning dataloggers near the nests. During hatching, some biometric measurements and weight were collected on a sample of newborns. During the night the beaches outside the reserve are affected by disturbances such as light pollution and the presence of spectators. Protections such as shaded corridors were created during the hatchings to shield the newborns from artificial lights and to ensure that they reach the sea safely. Conigli beach is the only one on the island to have a regulation that prohibits visitor's access at night and where, over the years, the pressures linked to mass tourism have been reduced or even eliminated (Prazzi et al., 2010). From 2021 in Conigli beach Legambiente Sicilia has further strengthened regulation regarding the actions of tourism by introducing a limit to the number of entrances to the beach in the summer period (Dimarca et al., 2023). This has made it possible to further increase the level of environmental protection which has had positive outcome on the conservation of habitats and species present on the site, since it halved the simultaneous presences on the beach and increased the areas designated for conservation and removed from tourist trampling (Dimarca et al., 2024).

RESULTS AND DISCUSSION

Main data about nesting activity of *Caretta caretta* on Lampedusa Island in the period 2022-2023 are reported in Table 1. A total of 22 nests were laid on 5 different beaches (Conigli Beach, Guitgia, Cala Croce, Cala Spugne, Portu Ntoni). With its 16 nests, 2023 is the year with the highest number of ovipositions ever recorded in Lampedusa. The previous record was achieved in 2016 with 9 nests (Prazzi & Giacoma, 2018). Cala Spugne and Portu Ntoni represent two new oviposition sites ascertained for the first time in 2022 (Cala Spugne) and 2023 (Portu Ntoni) by the staff of Nature Reserve. Total number of eggs per nest ranged from 60 to 137 (mean: 88.3 ± 19.6 SD; N=22); incubation period (the period between the nesting and the first hatchling emergence) ranged from 50 to 74 days (mean: 57.8 ± 6.7 SD; N=19); the emergence of hatchlings took from 3 to 12 days; hatching success (proportion of hatched eggs) ranged from 12.9% to 98.3% (mean: 83.4 ± 21.4; N=22).

Eggs relocation involved a total of 16 nests and for the first time in Lampedusa the staff of Nature Reserve carried out nest relocation to another beach. This took place for eggs laid in Cala Spugne (2 nests in 2022 and 3 nests in 2023). Cala Spugne

Nest Code	Nesting	Site	Eggs relocation	N. eggs	Incubation period (days)	Hatching success (%)	Dead hatchlings
1/2022	16/06/2022	Guitgia	yes	137	57	72.3	0
2/2022	28/06/2022	Cala Spugne	yes*	89	52	96.6	0
3/2022	06/07/2022	Conigli	yes	78	51	94.9	0
4/2022	13/07/2022	Cala Spugne	yes*	94	50	91.5	1
5/2022	14/07/2022	Conigli	yes	80	53	83.8	0
6/2022	n.o.	Conigli	no	93	--	94.6	0
1/2023	04/06/2023	Conigli	no	102	74	69.6	1
2/2023	20/06/2023	Conigli	yes	116	58	85.3	7
3/2023	21/06/2023	Conigli	yes	111	58	86.5	2
4/2023	27/06/2023	Cala Spugne	yes*	101	62	12.9	0
5/2023	01/07/2023	Cala Croce	yes	60	66	86.7	0
6/2023	04/07/2023	Conigli	no	92	62	96.7	0
7/2023	06/07/2023	Conigli	yes	82	50	93.9	1
8/2023	10/07/2023	Cala Spugne	yes*	88	55	90.9	0
9/2023	13/07/2023	Conigli	yes	102	53	96.1	11
10/2023	15/07/2023	Cala Croce	yes	71	61	93.0	0
11/2023	15/07/2023	Conigli	no	97	53	97.9	1
12/2023	24/07/2023	Cala Spugne	yes*	85	54	92.9	0
13/2023	07/08/2023	Cala Croce	yes	60	69	35.0	0
14/2023	11/08/2023	Conigli	yes	85	60	70.6	0
15/2023	n.o.	Portu Ntoni	no	60	--	95.0	1
16/2023	n.o.	Portu Ntoni	no	60	--	98.3	0

Table 1. Main data on nesting activity of *Caretta caretta* in Lampedusa in 2022 and 2023.
(n.o. = not observed; * = eggs relocation on Conigli beach)

is a small strip of sand where the point of maximum distance from the sea measures approximately 7 meters; furthermore, its surface varies greatly depending on the sea level. With winds blowing from the South, East and South-East, the sea level rises to cover, even totally, the whole small beach. For this reason, given the high risk of inundation for the nests laid on this beach and the lack of a suitable area where to relocate the eggs, it was decided to carry out eggs relocation to Conigli beach, which represents the most suitable site to guarantee eggs hatching. The distance between Cala Spugne and Conigli beach is about 7 km by road. Therefore, the staff of the reserve transported the eggs with the service car. All relocation operations were carried out as quickly as possible, according to the protocols, and taking care to always keep the eggs safe. The results obtained confirmed the success of this practice, in fact 4 of the 5 nests laid in Cala Spugne and relocated to Conigli beach achieved over 90% hatching success; only the 4/2023 nest had a lower result, but in this case the eggs had anomalies when they were found, so it cannot be ruled out that this influenced the lower hatching success.

The values relating to hatching success do not differ much among nesting sites, although it is worth noting the presence of impacts linked to mass tourism found in beaches outside the Reserve. The presence of tourist facilities located on Guitgia, Cala Croce and Portu Ntoni, active even at night, has made the management of the nesting and hatching phases particularly difficult and stressful for both adult females and newborns, thus requiring a greater effort to mitigate the various threats presented by light pollution, music and the presence of people at night. Shaded corridors realized at Guitgia and Cala Croce prevented the hatchlings from being disoriented by artificial lights; during the hatchings on Guitgia, Cala Croce and Portu Ntoni, distancing barriers have been realized to reduce as much as possible the disturbance caused by the numerous visitors present during the night; since Guitgia overlooks the port, and the hatchlings risked being trapped in this area with high nautical traffic, the newborns of Guitgia were released in a safer area which ensured they reached the open sea. In these last years there has been an increase in protection efforts. However, they do not appear sufficient compared to the growth of pressures and threats linked to tourist-seaside activities on the increasingly widespread sites used by *Caretta caretta*. In Lampedusa all this is evident on the beaches outside the Nature Reserve, where disturbance and threat factors are still abundant (Fig. 2).

Thus the importance of the work carried out in recent years on Conigli beach is highlighted once again: here, during the night, hatching events occur in the absence of threats or impacts of anthropic origin, mainly thanks to the numerous conservation measures implemented by the managing body of the reserve and the adoption of regulation which from 2021 has been strengthened and improved by introducing a limit on the number of visitors to the beach (Fig. 3). For years now, the management of Conigli beach has represented a consolidated model of coexistence between conservation of nature and sustainable use. Hence, it should constitute a stimulus to apply some or all practices in other areas outside the Reserve. Thereby, regulating the use and protection of the beaches which, as we ascertained, they are almost all *Caretta caretta* nesting sites.

Figure 1. Nests protection on Conigli beach.

Figure 2. Tourism at Guitgia beach during evening.

Figure 3. Conigli beach: an example of integration between environmental conservation and sustainable tourism.

ACKNOWLEDGMENTS

The authors wish to thank all those who provided help and support during monitoring and protection activities; a special thanks to our colleague Gianfranco Barraco and to all the volunteers and collaborators who contributed to the protection of nests and hatchlings, to the staff of the Marine Protected Area of the Pelagie Islands and to the Coast Guard of Lampedusa for the support and collaboration provided during the protection activities of the nests laid on the beaches outside the Nature Reserve. All activities were carried out in accordance with the authorizations of the Ministry of Ecological Transition held by Legambiente Sicilia as managing body of the Nature Reserve.

REFERENCES

AA. VV., 2013. Linee guida per il recupero, soccorso, affidamento e gestione delle tartarughe marine ai fini della riabilitazione e per la manipolazione e rilascio a scopi scientifici. Linee Guida 89/2013, ISPRA – Ministero dell'Ambiente e della Tutela del Territorio e del Mare, 72 pp.

Balletto E. (a cura di), 2003. Piano d'Azione per la Conservazione della tartaruga marina *Caretta caretta* nelle Isole Pelagie. Edi.tur srl, 60 pp.

Bombace M., De Domenico R., Lo Valvo F. & Nicolini G., 2001. Interventi finalizzati alla salvaguardia del sito di ovodeposizione della tartaruga marina *Caretta caretta* a Lampedusa. Il Naturalista siciliano, 25 (Suppl.): 111–119.

Dimarca A., Casamento G. & Prazzi E., 2023. La gestione della Spiaggia dei Conigli nell'Isola di Lampedusa. Protezione della natura, riqualificazione ambientale e turismo sostenibile. Seascape. 02_Tourism (January–June 2023), Padova: 132–137.

Dimarca A., Billeci V., Casamento G., Di Pietro R., Maraventano G., Prazzi E. & Sorrentino G., 2024. Protected Natural Areas and sustainable use: the Spiaggia dei Conigli in the "Lampedusa Island" Nature Reserve (Agrigento, Sicily, Italy). Biodiversity Journal, 15: 163–168 https://doi.org/10.31396/Biodiv.Jour.2024.15.2.163.168

Giacoma C. & Mari F. (a cura di), 2003. Protocolli per la gestione dei Centri di Recupero delle Tartarughe Marine. Edi.tur srl, 24 pp.

La Mantia T., Messana G., Billeci V., Dimarca A., Del Signore M.B., Livreri Console S., Maraventano G., Nicolini G., Prazzi E., Sanguedolce F., Sorrentino G. & Pasta S., 2012. Combining bioengineering and plant conservation on a Mediterranean islet. iForest, 5: 296–305.

Motta L. & Motta M., 2007. Rischio geomorfologico indotto da elevato carico turistico: il caso della Spiaggia dei Conigli (Isola di Lampedusa). In: M. Picazzo (Ed.), Clima e rischio geomorfologico in aree turistiche. Patron, Quarto Inferiore, pp. 181–205.

Prazzi E., Nicolini G., Piovano S. & Giacoma C., 2010. Protezione di *Caretta caretta* (Reptilia Chelonia) nella Riserva Naturale di Lampedusa. Il Naturalista siciliano, 34: 265–294.

Prazzi E., Nicolini G., Piovano S. & Giacoma C., 2013. La spiaggia dei Conigli a Lampedusa: un modello di gestione per la conservazione di *Caretta caretta*. In: Di Tizio L., Brugnola L., Cameli A. & Di Francesco N. (Eds.), Atti II Congresso SHI Abruzzo e Molise "Testuggini e Tartarughe". Ianieri Ed., Pescara, pp. 127–133.

Prazzi E. & Giacoma C., 2018. Nidificazione di *Caretta caretta* (Reptilia Cheloniidae) sull'isola di Lampedusa nel 2016, con ritrovamento di due nuovi siti di deposizione. Il Naturalista siciliano, 42: 111– 124.

Prazzi E., 2022. Nesting activity of Loggerhead sea turtle *Caretta caretta* (Linnaeus, 1758) (Reptilia Cheloniidae) from 2018 to 2021 on Lampedusa Islands (Pelagie Islands, Sicily Channel). Biodiversity Journal, 13: 141– 144. https://doi.org/10.31396/Biodiv.Jour.2022.13.1.141.144