

special feature

Sea Turtles

of the Mediterranean Sea



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A SEA OF BOUNTY AND DANGER

The Mediterranean Sea is a bountiful yet dangerous place for sea turtles. In an area bounded by Europe on its northern shores, Asia to the east, and Africa to the south, sea turtles share their relatively small home (2.5 million square kilometers, or about 1 million square miles) with more than 150 million people who live along the coasts of 20 countries and two island nations. On top of that, the Mediterranean basin is by far the largest global tourism destination, attracting almost a third of the world's international tourists every year. Characterized by beautiful natural and cultural heritage sites and by rich biodiversity, the Mediterranean is also a troubled and overexploited sea, where sea turtles have a hard time coping with high fishing pressure, gas and oil development, major cross-continental maritime traffic, beachfront and other habitat impacts, and widespread marine pollution.

A turtle's journey around the Mediterranean, following the main counterclockwise surface currents, would begin at the inflow from the Atlantic that passes through the 14-kilometer-wide (less than 9 miles) Strait of Gibraltar, then along the coast of North Africa starting in

Morocco, passing between Tunisia and Malta, and moving into the eastern basin. By now our hypothetical turtle would have gotten used to the high salinity (over 38 practical salinity units) caused by an imbalance between water gain through river inflow and loss through high evaporation. He would continue past the endless beaches of Libya and go by Egypt, where the Suez Canal allows Lessepsian fauna and flora migrants to enter from the Red Sea.

Now he'd turn north, traveling through the Levant from Israel to Syria, passing zones of human conflict where turtle conservationists must watch out for more than just turtle nests on the beaches. Continuing westward, he'd pass between Cyprus and Turkey to continue along the southern coasts of Crete (Greece). Crossing over the sea's deepest recorded point of 5,267 meters (3.3 miles) in the Ionian Sea, he would then take a trip to Croatia in the far north of the cold Adriatic Sea and would circumnavigate the Italian peninsula to complete his tour in Spain, having traveled some 11,700 kilometers (7,270 miles).

TURTLE RESIDENTS AND VISITORS

Two of the world's seven species of sea turtles breed in the Mediterranean, and their nesting distribution is the result of several preglacial and postglacial colonization events. Two sea turtle regional management units (RMUs), or subpopulations, are present (see map, pp. 28–29). The Mediterranean loggerhead RMU is considered of least concern, though the species (*Caretta caretta*) is vulnerable globally, and the Mediterranean green RMU is as yet unranked, with the species (*Chelonia mydas*) considered endangered globally. Mediterranean loggerheads are the smallest specimens of this species in the world, and their nesting areas range from the Western Mediterranean to the Levantine coast in the east, with most of the estimated 8,000 clutches laid annually occurring in the Eastern Mediterranean, especially in Greece (see *SWOT Report*, vol. X, pp. 24–25). Green turtle nesting is confined to the easternmost part of the Eastern Mediterranean, mostly in Cyprus and Turkey, where more than 2,200 clutches are laid each year. Juvenile loggerheads forage throughout the Western Mediterranean in deep oceanic and shallow continental shelf regions. In the Eastern Mediterranean, adults tend to frequent the shallow continental shelf of the northern Adriatic and the Tunisian shelf, while juveniles remain more oceanic. Adult green turtles forage in Turkey, on the coasts of the Levant, and on North African shores (to Libya's western border). Some juvenile foraging has been reported in the Eastern

Mediterranean, off the Peloponnesian coast of Greece, and possibly also in the southern Adriatic.

Nonbreeding turtles from the Atlantic often enter the Mediterranean as well. They are mainly loggerheads from both sides of the Atlantic, which coexist with their indigenous conspecifics on oceanic foraging grounds. Generally, the Atlantic loggerheads enter the Mediterranean as small juveniles and are unable to depart until they have grown much larger and can confront the strong inward current at the Strait of Gibraltar, though new evidence has revealed that some Atlantic loggerheads are now breeding and nesting within the Western Mediterranean (see box, p. 25).

Visitors from the Atlantic also include green turtles that frequent the Western Mediterranean. Since indigenous greens are found only in the Eastern Mediterranean, the Atlantic greens do not share foraging grounds with the local greens. Leatherbacks have also been recorded throughout the basin and as far east as Egypt, Israel, and Syria. Though Mediterranean leatherbacks are generally large juveniles and adults of both sexes, no nesting by this species has ever been confirmed. The presence of both Kemp's and olive ridleys in the Mediterranean is confirmed but rare, with only a handful of records of juvenile Kemp's ridleys in France, Italy, Malta, and southern Spain and a single record of an olive ridley from Spain. There are several records of hawksbills in the Mediterranean.



A loggerhead turtle swims near seaside homes on the coast of Greece. With more than 150 million coastal residents and one of the world's highest levels of tourism, the Mediterranean Sea is an environment profoundly shaped by people. © KOSTAS PAPAITSOROS; PREVIOUS SPREAD: A loggerhead turtle swims above endemic seagrass (*Posidonia oceanica*) in the Mediterranean Sea. © KOSTAS PAPAITSOROS

MAJOR TURTLE REGIONS

SOUTHERN SHORES (Morocco to Egypt, Including Malta)

The 500 km (311 mi) coastline of Morocco is primarily a foraging habitat for loggerheads; leatherbacks also are regularly observed—and on rare occasions, greens. Most of the knowledge about sea turtles in this zone comes from strandings and animals incidentally captured by fishers. Fisheries interactions are unquestionably the most common threat to Morocco's turtles. However, until 2007, juvenile loggerheads were also found in markets, not necessarily for consumption but rather for the use of their carapaces and other products.

The 1,622 km (1,007 mi) Algerian coastline is dominated by rocky shores and sandy beaches, and here too sea turtles have been reported since the 1800s as stranding and being caught accidentally by fishers. They are typically loggerheads (70 percent) and some leatherbacks (30 percent). To date, no nesting has been confirmed, but rising temperatures may make nesting possible in Algeria; thus, authorities began to monitor beach temperatures in 2017 to evaluate potential nesting areas.

Three sea turtle species are observed in the waters adjacent to Tunisia's 1,148 km (713 mi) coastline; greens are rare, leatherbacks are regularly observed, and loggerheads are the most common. The wide continental shelf in southern Tunisia, including the Gulf of Gabès, is one of the most important foraging areas for sea turtles in the whole Mediterranean. The number of accidental captures by trawlers, longlines, and gill nets suggests a high turtle density in that region. Tunisia has an active sea turtle stranding network and a rescue center based in Monastir. Loggerhead turtles also nest regularly in Tunisia, especially on Kuriat Island, which receives about 25 nests each year.

The small (315 sq km, or 122 sq mi) island nation of Malta lies southeast of the Sicily Channel, connecting the Mediterranean's

western and eastern basins. Turtles are frequently found in Maltese waters, with five species being recorded; however, subadult and juvenile loggerheads are the most commonly seen. Malta has three marine NATURA 2000 sites (part of the European Union's NATURA 2000 network of protected areas) for protection of loggerhead turtles, and since 2001, a rescue center has rehabilitated many of the accidentally caught and stranded turtles, especially those with ingested fishing lines. Malta has also seen some sporadic turtle nesting, although sandy beaches are rare, only 2.5 percent of all beaches.

At 1,770 km (1,000 mi), Libya's coastline is the longest of any African country bordering the Mediterranean, and long sandy beaches are its predominant feature. It also has the oldest nesting colony for loggerhead turtles in the entire basin. The Libyan Sea Turtle Program, supported by the Regional Activity Centre for Specially Protected Areas (RAC/SPA), which is part of the United Nations Environment Programme's Mediterranean Action Plan (UNEP-MAP), has been monitoring loggerhead turtles for many years, even during periods of political turmoil. However, the total numbers of nesting females still remain unknown. Postnesting loggerheads also seem to frequent the Tunisian shelf. No green turtle has been found nesting in the country, but Libyan waters provide ample foraging and overwintering habitats in the Gulfs of Bomba and Sirte for green turtles that nest in Levantine countries.

Egypt's 1,050 km (652 mi) of Mediterranean coast host potentially important loggerhead and green turtle foraging grounds and migratory corridors. The presence of leatherbacks has also been verified through stranding and bycatch data. Of special interest is Bardawil lagoon, an important foraging and possible overwintering site, which requires further in-water investigation and conservation action, especially with regard to fisheries interactions.

Loggerhead and green turtle nesting in Egypt are low when compared with other Mediterranean sites, though minor diffuse nesting is scattered along the western Egyptian coastline. The main nesting area is a 22 km (14 mi) sandy beach on the North Sinai Peninsula (average nests/year: 67 for loggerheads and 7 for greens). Ongoing surveys by Egyptian authorities with assistance from RAC/SPA are expected to provide updated information in relation to nesting along the western coastline (between Port Said and El Salum). In addition to widespread regional threats like habitat degradation, pollution, and bycatch, illegal trade is particularly acute. Trade in turtle products has been reported since the beginning of the 20th century, and consumption is a tradition that has been documented since at least the 1970s and up through the present, predominantly in Alexandria and Port Said.

LEVANTINE COAST (Israel to Turkey, Including Cyprus)

Israel's 200 km (124 mi) Mediterranean coastline is largely suitable for loggerhead and green turtle nesting, although light pollution is a problem, and the continental shelf's moderate slope provides foraging grounds for both species. Since 1993, Israel's Nature and Parks Authority has surveyed beaches during nesting season; nests are

relocated to protected hatcheries, a practice that has increased nest numbers over time. In 1999, a turtle rescue center was founded that today tends to about 100 animals yearly, with 70 percent being returned to the wild. A turtle head-start program that was begun in 2002 is now a captive breeding facility as well. The facility's volunteers serve the public through lectures, media publications, school programs, and other turtle conservation work, and their research addresses aspects of turtle biology, genetics, movement ecology, husbandry, veterinary care, and endocrinology.

Lebanon's 200 km (124 mi) coast has only a few sandy beaches suitable for sea turtle nesting. Extensive urban development, sand mining, and litter reduce the available turtle habitat even further. Loggerhead and green turtle nests are found in small numbers in southern Lebanon, an area affected by military operations that is also home to the Tyre Coast Nature Reserve, which is dedicated to the protection of sea turtles.

Loggerhead turtle nesting was first recorded in 1991 on Syria's 193 km (120 mi) coast by the Mediterranean Association to Save the Sea Turtles (MEDASSET), and a survey in 2004 confirmed that low-level loggerhead nesting occurred at several locations in the country. The survey also declared Syria among the top 10 nesting areas for Mediterranean green turtles, specifically one 12.5 km (8 mi) beach south of Latakia city. Local researchers have monitored turtle nesting there and at other places, though internal turmoil has prevented the acquisition of consistent data. Syria's coastal waters are home to juvenile green turtles year-round and are part of a migratory corridor for turtles nesting in Cyprus and other areas to the west.

Green and loggerhead turtles nest on the beaches of Cyprus (an island with an area of 9,250 sq km, or 3,571 sq mi). In 2018, well over 1,300 green and 2,200 loggerhead clutches were laid islandwide, making this a noteworthy nesting site for both species. Because of significant long-term conservation efforts, including caging of nests and beach protection, nesting populations appear to be stable or rising, although loss of nesting habitat and predation by dogs and foxes is an ongoing problem.

Large numbers of both species also forage around the shores of Cyprus, with juvenile and subadult green and adult loggerhead turtles being the most common. More than 1,000 turtles are estimated to be accidentally caught by small-scale fisheries each year, with a mortality rate in excess of 50 percent. Ongoing projects are under way to further understand and mitigate this effect. Through long-term monitoring of individual females nesting in Cyprus, researchers have learned a great deal about their life history and behavior. Most notably, females of both species can breed for at least 24 years—maybe longer—according to 27 years of observations. Furthermore, research has demonstrated that females show site fidelity to their winter foraging grounds and that the coast of Cyprus is an important migratory corridor for turtles from both Cyprus and Turkey.

In the north of the Levant, Turkey has a total of 21 nesting beaches along its 1,577 km (980 mi) of Mediterranean coastline. Its western beaches are mainly used by loggerhead turtles, which nest in the highest densities on Amamur, Belek, and Dalyan beaches and represent 65 percent of the country's nesting activity. With annual numbers of loggerhead turtle nests as high as 6,000, Turkish beaches make a very important contribution of around one-third of the total loggerhead nests in the Mediterranean basin. Green turtles nest mainly on Turkey's eastern beaches, including Akyatan, Alata, Davultepe, Kazanlı, Samandag, and Sugözü, which represent 88 percent of the country's nesting and as many

CLIMATE CHANGE INDUCES A LOGGERHEAD RANGE EXTENSION

At the beginning of the 21st century, loggerhead nesting in the Western Mediterranean was extremely rare. On the few occasions that a nest was recorded, hatching success and the proportion of female offspring were generally low, probably owing to the relatively cold temperatures. In the past two decades, loggerhead nesting events have steadily increased, and in 2018, the northernmost loggerhead turtle nest ever was recorded in France, well above latitude 43° north, which produced 63 hatchlings. Nest locations are scattered, but researchers have identified one area in southern Italy where nesting has occurred regularly since 2012. Not only have the number of nests increased, but also it is predicted that nests are producing more female hatchlings, which is possible only when the environmental temperature is sufficiently warm. Dozens of loggerhead nests are now reported each year in the Western Mediterranean, and the actual nesting intensity is probably even higher, since many nests are likely to go undetected.

Not surprisingly, there appears to be a correlation between this trend and warming sea surface temperatures in southern Italy over the past century. Climate change is widening the temporal window of suitable thermal conditions that can be opportunistically used for nesting by adult loggerheads foraging in the Western Mediterranean. Genetic analysis of the nesting events suggests that the sporadic nests are not remnants of a past population but the result of long-distance dispersal events from both Mediterranean and Atlantic nesting beaches. Although it is exciting to witness a significant range extension like this, such a change implies that measures must be urgently imposed so that these animals have suitable habitat for their changing needs. Conservation programs to mitigate the effect of anthropogenic activities, coupled with extensive monitoring of potential suitable habitats, will be crucial to stabilize this new nesting population in the Western Mediterranean.



A green turtle returns to sea after nesting on the island of Cyprus. © LAWRENCE SAMPSON

as 4,000 nests per year, or nearly two-thirds of the total green turtle nests in the Mediterranean.

The Turkish coast also hosts important feeding grounds for different age classes of both species. Monitoring of 15 of those beaches is carried out by universities, nongovernmental organizations, and government authorities. Turkey also has a turtle rescue center and three first aid stations along the Aegean and Mediterranean shores. Scientific studies in Turkey include sea turtle genetics, temperature-based sex determination, stable isotope analyses, pollution and plastic ingestion, and fisheries bycatch monitoring.

NORTHERN SHORES (Greece, the Adriatic, and West to Spain)

Systematic nest counts that have been conducted since 1984 by the Sea Turtle Protection Society of Greece (ARCHELON) and its contingent of international volunteers have shown that Greece hosts the largest number of loggerhead nests in the Mediterranean (more than 6,000 in 2018). Top nesting sites include Kyparissia Bay in the Peloponnese and Laganas Bay in Zakynthos. Both sites have been protected since 1999, the former by presidential decree and the latter by the establishment of the National Marine Park of Zakynthos.

Other important nesting beaches in the Peloponnese and on Crete are included in the European Union's NATURA 2000 network of protected areas. Over the years, the total number of nests has remained more or less stable. However, a notable steep increase at Kyparissia Bay, which now exhibits higher nest numbers than Laganas Bay, is a result of long-term nest protection against mammal predators. This increase is offset by severe declines in Rethymno and Chania on Crete, which can be attributed to rising anthropogenic pressures. ARCHELON continues in-water work in Amvrakikos Bay, a notable foraging area for loggerhead turtles, with more than 1,000 juvenile and adult loggerheads—mostly male—now tagged and measured. ARCHELON has also operated a Sea Turtle Rescue Centre in Glyfada since 1994, which rehabilitates injured turtles that are found along the 16,000 km (9,942 mi) Greek shoreline through their Stranding Network.

Entering the Adriatic Sea, loggerheads, greens, and leatherbacks migrate past or reside along Albania's 362 km (225 mi) coastline. Although there has been evidence of sporadic nesting for some years, the first actual nest was officially confirmed in 2018. Albania's Drini Bay is potentially an important habitat for overwintering and foraging—and possibly as a developmental habitat for both adult and subadult loggerheads (mostly originating from Greece) and occasionally by greens as well. A systematic study of Albania's turtle population structure in 2008–2010 showed the presence of a large number of male turtles and a very substantial proportion of subadult animals. Tagging and satellite tracking revealed site fidelity both intra-annually and interannually. Apart from the usual hazards found throughout the Mediterranean, illegal fishing techniques, such as the use of dynamite, pose serious threats to Albania's turtles and other marine life.

North along the Adriatic coast from Albania, Montenegro has 294 km (183 mi) of coastline, and Bosnia and Herzegovina has 20 km (12.4 mi). Croatia has the longest eastern Adriatic coastline, at 526 km (327 mi), though that number becomes 7,368 km (4,578

mi) when including the coastlines of the country's many islands. Finally, Slovenia has 47 km (29 mi) of coastline. Those countries are similar in that sea turtles do not nest on their beaches, but tens of thousands of turtles, mostly loggerheads, are found year-round in their nearby waters. Genetic research has shown that most of these animals originated in Greece, and satellite and flipper tagging have further confirmed that many loggerheads nesting in Greece migrate to the Adriatic for foraging and overwintering.

Italy, including its many islands, has a coastline of about 7,600 km (4,722 mi) on the Adriatic, Ionian, and Tyrrhenian seas, and it is effectively the dividing line between the western and eastern basins of the Mediterranean. Turtles of all species that roam the Mediterranean Sea inevitably cross Italian waters at some point, whether for foraging or simply moving from one place to another, though the most common species in Italy is the loggerhead in all life stages. There are good neritic foraging habitats off the Tyrrhenian and Adriatic shores; however, those zones are also heavily fished, resulting in bycatch mortality and high stranding rates. High numbers of human-induced strandings have led to a proliferation of more than 20 sea turtle rescue centers, making Italy the country with the highest number of such facilities in the region. Italy has regular nesting along the southern Ionian coast and on nearby pelagic islands, and loggerhead nesting has recently increased on Italy's western beaches.

The French Mediterranean waters, including Corsica, are frequented mainly by loggerhead turtles and occasional leatherbacks. Leaving the pelagic waters of the Liguro-Provençal current, loggerhead juveniles arrive in the spring for feeding in the Gulf of Lions, but they may remain, as it is also believed to be an overwintering area. Recently the fourth loggerhead nest since 2002 was observed on the Languedoc coast, giving France the northernmost nesting site of this species worldwide. Loggerheads are frequently caught unintentionally by fishermen, and many also wash ashore dead. Annually, these strandings account for 50–110 animals, as recorded by the French observer network, Réseau Tortues Marines de Méditerranée Française (RTMMF) and French rescue centers.

Notwithstanding the tiny peninsula of Gibraltar (UK) with its 4 km (2.5 mi) coastline that witnesses the comings and goings of sea turtles between the Atlantic and Mediterranean through the Strait of Gibraltar, Spain is the final country of this counterclockwise tour around the Mediterranean. Spain reports five sea turtle species in the waters adjacent its 1,670 km (1,037 mi) of coast, yet only loggerheads occur in large numbers. Most of those are juveniles from nesting beaches in the northwest Atlantic, the Mediterranean, and Cape Verde. The loggerheads of Mediterranean origin are predominantly found off eastern Spain in shallow seas; conversely, loggerheads of northwest Atlantic origin are mostly found off the Balearic Islands and are more oceanic. Loggerheads from Cape Verde represent less than 4 percent of the total number of loggerheads in Spanish seas.

Bottom trawling and drifting longline fisheries are the main threats for turtles off mainland Spain and the Balearic Islands. Until 2001, evidence of loggerhead turtle nesting was scarce, but Spain has recorded about 42 nests over the past two decades, and genetic analyses indicate an ongoing and exciting process of colonization from distant nesting beaches (see box, p. 25).

CONSERVATION

Sea turtle conservation started on Cyprus's nesting beaches in the early 1970s, then in Greece and Turkey in the 1980s, and in Israel by the 1990s. Surprisingly, important turtle nesting rookeries were still being discovered into the 2000s. For countries that host the majority of the Mediterranean's sea turtle nesting, such as Cyprus, Greece, and Turkey, nest protection has been the principal conservation focus, led by local communities, nonprofit groups, and volunteers. Where turtle nesting is less common, as in Italy, sea turtle rescue and rehabilitation centers are more prevalent and serve as the frontlines of actions to help sea turtles.

The 1980s saw the inauguration of important national and international grassroots turtle conservation organizations in the Mediterranean, including ARCHELON and MEDASSET, in addition to projects supported by the World Wide Fund for Nature (WWF) and others. Meanwhile, on a governmental policy scale, the

Parties to the Barcelona Convention for the Protection of the Marine Environment and the Coastal Regions of the Mediterranean, a treaty that began in 1975 as “the Convention for Protection of the Mediterranean Sea against Pollution,” was amended by the Genoa Declaration in September 1985 to include the protection of Mediterranean marine turtles among their priority targets for the period 1985–1995. And in 1989, all the Mediterranean countries adopted an Action Plan for the Conservation of Marine Turtles within the Mediterranean Action Plan (MAP) framework.

In 1990, the Council of Europe (Bern Convention) released one of the first important reports on Mediterranean marine turtles, which described the conservation status and geographical distribution of all species and recommended cost-effective research and realistic conservation measures. Finally, UNEP's RAC/SPA has been working for more than three decades on marine turtles.

CONCLUSION

The Mediterranean is an exciting place for sea turtle research, with prospects of range expansion and new colonization, and with long-term conservation projects that have achieved stable or even positive population trends. Yet researchers and conservationists still have a long way to go before turtles in the Mediterranean can be called safe. Indeed, many major threats, particularly fisheries bycatch and climate change, still urgently need solutions. To that end, a solid network of

conservationists, researchers, and stakeholders must continue to focus their energies on the actions needed to ensure that Mediterranean sea turtles survive and thrive into the future. Fortunately, the community dedicated to the Mediterranean sea turtle, despite its disparity of cultures and languages, is a consolidated and collaborative movement of individuals, institutions, and governments committed to this worthy goal. ■

FEATURE MAPS:

BIOGEOGRAPHY OF SEA TURTLES IN THE MEDITERRANEAN SEA

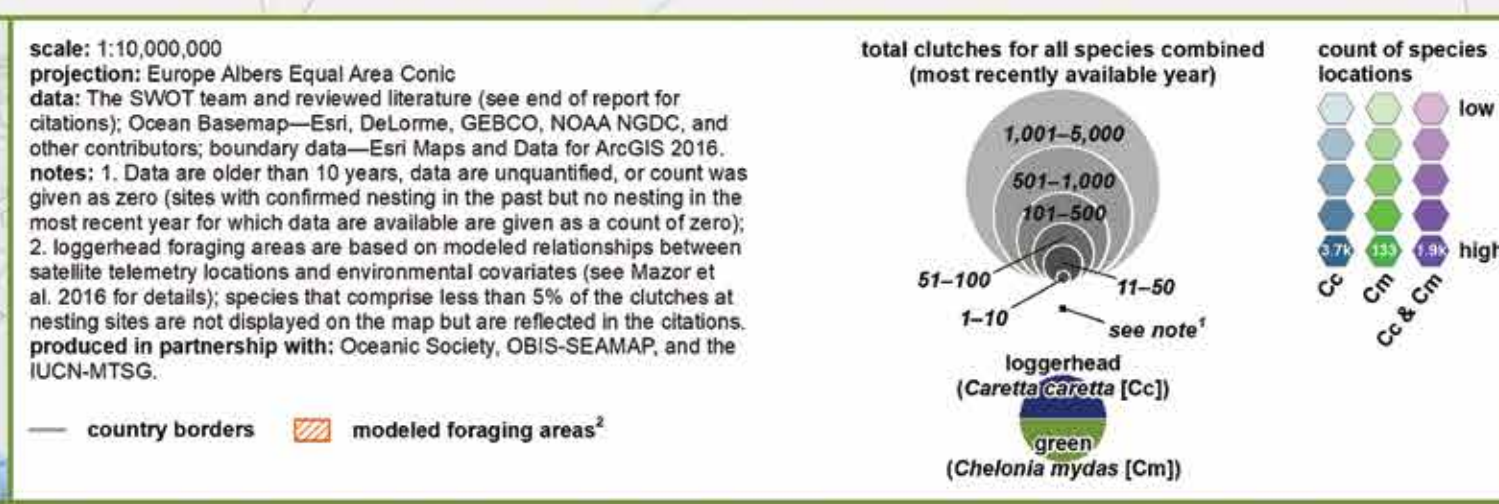
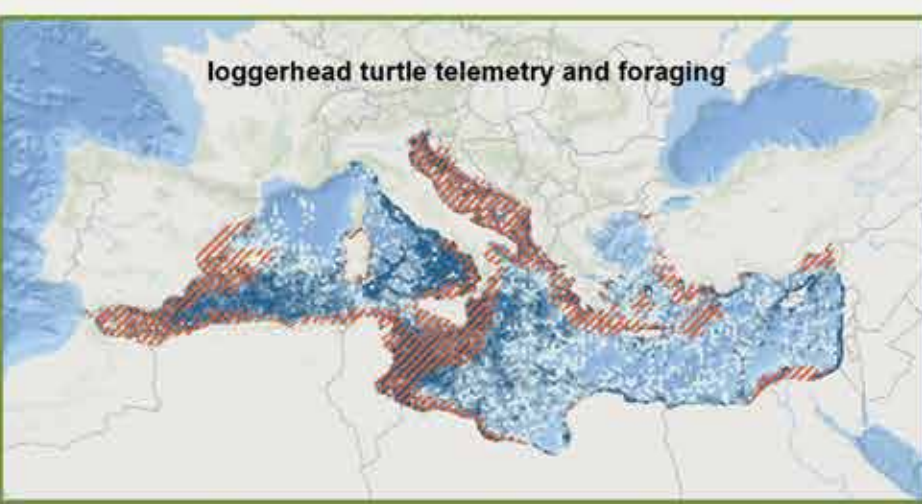
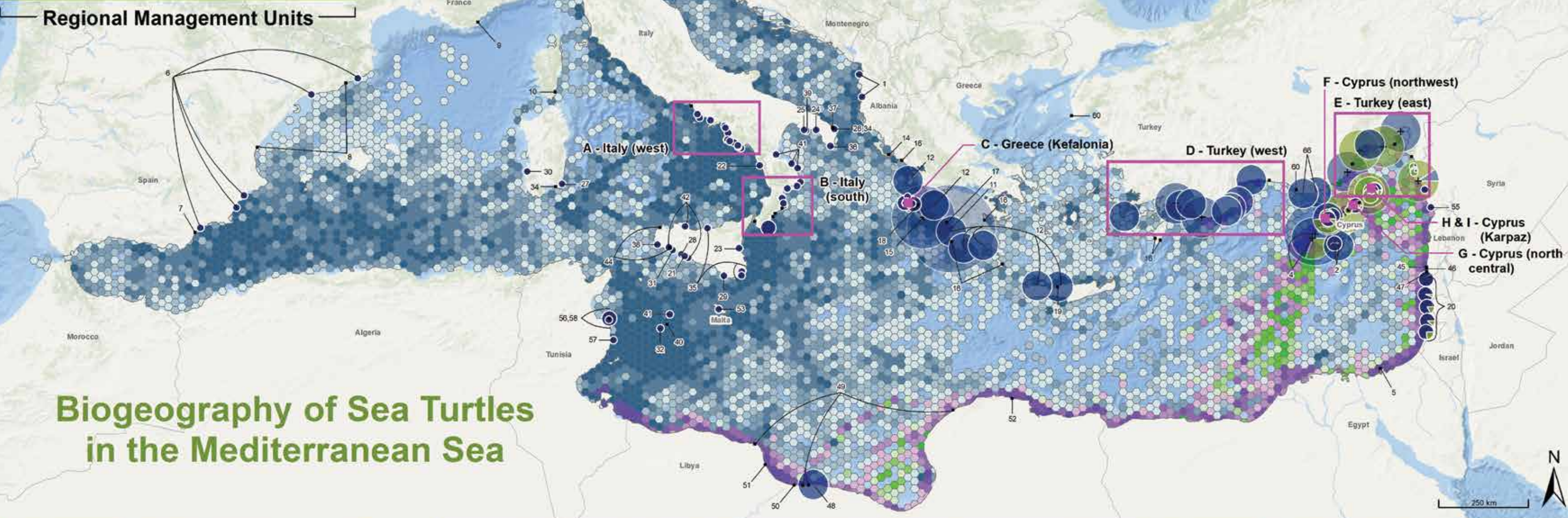
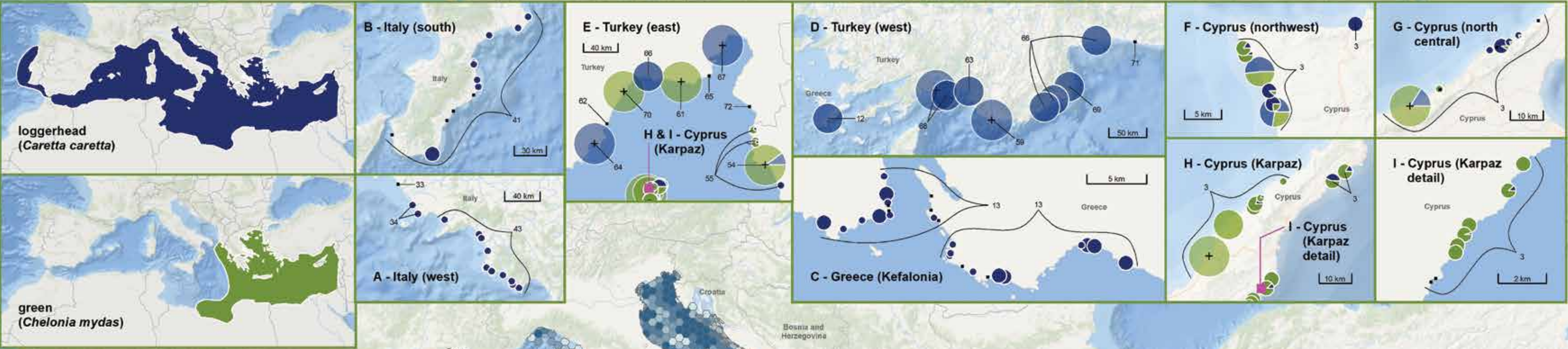
The maps on pp. 28–29 display available nesting and satellite telemetry data for sea turtles in the Mediterranean Sea, as well as modeled foraging areas for loggerhead turtles (p. 28, bottom left). The data include 216 nesting sites and 316 satellite tags, compiled through a literature review and contributed directly to SWOT by dozens of data contributors throughout the Mediterranean region. For metadata and information regarding data sources and contributors, see the data citations beginning on p. 50.

Nesting sites are represented by dots that are colored and scaled according to the species present and their relative nesting abundance in the most recent year from which data are available. If multiple species are present at a particular nesting site, the dot for that site is scaled according to the total nesting abundance for both species combined, and the proportion of nesting by each species is indicated by the proportion of each species' respective color within the dot. For the purposes of uniformity, all types of nesting counts (e.g., number of nesting females, number of crawls) were converted to number of clutches as needed. Conversion factors were as follows: for *Caretta caretta*, a ratio of 2 nests to each nesting female and 0.68 nests for every crawl; for *Chelonia mydas*, a ratio of 3 nests to each nesting female and 0.64 nests for every crawl.

Satellite telemetry data are represented as polygons that are colored according to the number of locations and the composition of species they contain. Darker colors represent a higher number of locations, which can indicate that a high number of tracked turtles were present in that location or that turtles spent a lot of time in that location. Telemetry data are displayed as given by the providers, with minimal processing to remove locations on land and visual outliers. As such, some tracks are raw Argos or GPS locations, whereas others have been more extensively filtered or modeled.

The maps on the upper left of p. 28, “Regional Management Units,” show the two Regional Management Units (or subpopulations) that primarily reside within the Mediterranean Sea. They were defined by Wallace et al. in 2010 by combining telemetry, genetics, tagging, and nesting data. Newer data have shown a wider range for green turtles into the southwestern Mediterranean that is not captured in the boundary of that Regional Management Unit.

We are grateful to all of the data contributors and projects that participated in this effort—please see the complete data citations beginning on p. 50 for details.



DATA RECORD 22

Metadata: 17 juvenile *Caretta caretta*; tags deployed at sea.
Source: Mansfield, K. L., J. Wyneken., W. Porter, and J. Luo. 2014. First satellite tracks of neonate sea turtles redefine the “lost years” oceanic niche. *Proceedings of the Royal Society B* 281 (1781): 20133039.
SWOT Contact: Kate Mansfield

DATA RECORD 23

Project Partners: College of William and Mary, Virginia Institute of Marine Science
Metadata: 21 juvenile and 10 adult *Caretta caretta*.
Sources: (1) Mansfield, K. L., V. S. Saba, J. Keinath, and J. A. Musick. 2009. Satellite telemetry reveals a dichotomy in migration strategies among juvenile loggerhead sea turtles in the northwest Atlantic. *Marine Biology* 156: 2555–2570.
(2) Mansfield, K. L. 2006. Sources of mortality, movements and behavior of sea turtles in Virginia. Dissertation. College of William and Mary, Marine Science School, Virginia Institute of Marine Science, Gloucester Point, VA.
SWOT Contact: Kate Mansfield

DATA RECORD 24

Metadata: 127 *Caretta caretta*; tags deployed on nesting females.
Source: Tucker, T., and K. Mazzarella. 2018. Personal communication. In *SWOT Report—State of the World’s Sea Turtles*, vol. XIV (2019).
SWOT Contact: Tony Tucker

DATA RECORD 25 | SWOT ID: 410

Project Title: Virginia Aquarium Stranding Response Program
Project Partners: Virginia Aquarium Stranding Response Program, Virginia Aquarium & Marine Science Center, Seaturtle.org
Metadata: 17 juvenile, 3 subadult, and 1 adult *Caretta caretta*; tags deployed between 2007 and 2016 on stranded turtles.
Sources: (1) Lockhart, G. 2018. Virginia Aquarium Stranding Response Program. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/410>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contacts: Gwen Lockhart and Susan Barco

DATA RECORD 26 | SWOT ID: 978

Project Title: Virginia Aquarium Sea Turtle Research
Project Partner: Virginia Aquarium & Marine Science Center Foundation
Metadata: 1 adult, 7 subadult, and 2 unknown-life-stage *Caretta caretta*; tags deployed on wild-caught or by-caught individuals in 2013 and 2015.
Sources: (1) Barco, S. 2018. Virginia Aquarium Sea Turtle Research. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/978>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Susan Barco

DATA RECORD 27 | SWOT ID: 1018

Project Title: Virginia Aquarium and U.S. Navy Sea Turtle Research Project

Project Partners: Virginia Aquarium Research and Conservation Department; U.S. Fleet Forces Command, Naval Facilities Engineering Command (NAVFAC) Atlantic

Metadata: 1 adult, 4 juvenile, and 11 unknown-life-stage *Caretta caretta*; tags deployed between 2013 and 2015.
Sources: (1) Lockhart, G. 2018. Virginia Aquarium and U.S. Navy Sea Turtle Research Project. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1018>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Gwen Lockhart

DATA RECORD 28 | SWOT ID: 655

Project Title: North Carolina Long-Term Sea Turtle Monitoring Project
Project Partners: Seaturtle.org, the North Carolina Wildlife Resources Commission, Duke University Marine Laboratory
Metadata: 8 adult *Caretta caretta*; tags deployed in 2010, 2012, and 2013.
Sources: (1) Coyne, M. 2017. North Carolina Long-Term Sea Turtle Monitoring Project. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/655>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Michael Coyne

DATA RECORD 29 | SWOT ID: 1342

Project Title: Florida Loggerhead Migrations
Project Partners: National Marine Fisheries Service Office of Protected Resources

Metadata: 38 adult *Caretta caretta*; tags deployed between 1998 and 2000.

Sources: (1) Schroeder, B. 2018. Florida Loggerhead Migrations. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1342>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Barbara Schroeder

DATA RECORD 30 | SWOT ID: 1490

Project Title: Juvenile Loggerhead Use of the Gulf Stream off Cape Hatteras, NC
Project Partners: North Carolina Renewable Ocean Energy Program, Protected Resources Branch of the National Oceanic and Atmospheric Administration Beaufort Laboratory, University of North Carolina Coastal Studies Institute, North Carolina Aquariums at Pine Knoll Shores and Roanoke Island, University of Central Florida
Metadata: 3 juvenile *Caretta caretta*; headstarted turtles were originally collected from North Carolina nests. Tagged turtles released in Sargassum mats in the Gulf Stream off the coast of North Carolina in May 2017.
Sources: (1) Dubbs, L. 2017. Juvenile loggerhead use of the Gulf Stream off Cape Hatteras, NC. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1490>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Lindsey Dubbs

MEDITERRANEAN

We are grateful to all who generously contributed their sea turtle data for inclusion in the maps on pages 28–29. For information about how the maps were created, please see page 26. We are especially grateful to Lucy Omeyer for her assistance in researching and compiling data from published and unpublished sources.

GUIDELINES OF DATA USE AND CITATION

The data that follow correspond directly to the maps on pages 28–29. In the case of nesting data, every data record is numbered to correspond with its respective point on the map. To use these data for research or publication, you must obtain permission from the data providers.

NESTING DATA CITATIONS

DEFINITIONS OF TERMS

Clutches: A count of the number of nests of eggs laid by females during the monitoring period. **Nesting females:** A count of nesting female turtles observed during the monitoring period. **Crawl:** A female turtle’s emergence onto the beach to nest. Such counts may or may not include false crawls. **Year:** The year in which a given nesting season ended (e.g., data collected between late 2015 and early 2016 would be listed as year 2016).

Nesting data are reported here from the most recent available nesting season or as averages for the years reported. Beaches for which count data are not available are listed as “unquantified.” A reported count of “N/A” indicates that no data were reported for that species at the respective site. Additional metadata are available for many of the data records and may be found online at <http://seamap.env.duke.edu/swot> or by viewing the original data source (if published).

ALBANIA

DATA RECORD 1

Data Source: Piroti, V., and I. Haxhiu. 2018. Nesting of loggerhead turtle (*Caretta caretta*) confirmed in Southeast Adriatic. In Lazar, B., and M. Jancic (eds.), *Book of Abstracts: 6th Mediterranean Conference on Marine Turtles*. Croatian Natural History Museum, Zagreb, Croatia.
Nesting Beaches: Divjaka, Kepi i Rodonit
Year: 2016
Species and Counts: *Caretta caretta*—1 clutch at each beach

CYPRUS

DATA RECORD 2

Data Source: Andrews, E. 2014. *Cyprus Turtlewatch 2014 Final Report*. University of Glasgow.
Nesting Beaches: Akrotiri, Episkopoi
Year: 2014
Species and Counts: *Chelonia mydas*—2 and 0 clutches, respectively; *Caretta caretta*—89 and 17 clutches, respectively

DATA RECORD 3

Data Source: Broderick, A. 2017. Loggerhead nesting in Cyprus. Personal communication. In *SWOT Report—State of the World’s Sea Turtles*, vol. XIV (2019).
Nesting Beaches: (1) Alagadi, (2) Ayphilon, (3) Balalan, (4) Dipkarpaz South, (5) Dolphin, (6) Doune, (7) Esentepe, (8) Golden, (9) Greenfields 1, (10) Greenfields 2, (11) Guzelyali, (12) Kantara, (13) Kaplica, (14) Lost, (15) Melons 1, (16) Melons 2, (17) Message in a Bottle, (18) Military, (19) Monster, (20) Monster North, (21) One Goat, (22) Peach, (23) Ronnas,

(24) Secret, (25) Smalls, (26) Tatlisu, (27) Thyme, (28) Two House, (29) West 1 and 2, (30) Wolf 1, (31) Wolf 2, (32) Tatlisu Belediya
Year: 2017
Species and Counts: *Caretta caretta*—(1) 42, (2) 1, (3) 0, (4) 1, (5) 5, (6) 0, (7) 0, (8) 8, (9) 0, (10) 0, (11) 36, (12) 5, (13) 8, (14) 3, (15) 0, (16) 1, (17) 8, (18) 0, (19) 37, (20) 26, (21) 1, (22) 7, (23) 6, (24) 32, (25) 6, (26) 20, (27) 4, (28) 0, (29) 46, and (30–32) 0 clutches; *Chelonia mydas*—(1) 221, (2) 74, (3) 0, (4) 36, (5) 32, (6) 12, (7) 1, (8) 42, (9) 0, (10) 0, (11) 0, (12) 1, (13) 2, (14) 31, (15) 15, (16) 20, (17) 42, (18) 0, (19) 14, (20) 8, (21) 5, (22) 9, (23) 283, (24) 4, (25) 0, (26) 2, (27) 15, (28) 1, (29) 43, (30) 15, (31) 17, and (32) 0 clutches

DATA RECORD 4

Data Sources: (1) Casale, P., A. Broderick, J. A. Camiñas, L. Cardona, C. Carreras, A. Demetropoulos, W. J. Fuller, B. J. Godley, S. Hochscheid, Y. Kaska, B. Lazar, D. Margaritoulis, A. Panagopoulou, A. F. Rees, J. Tomás, and O. Türközan. 2018. Mediterranean sea turtles: Current knowledge and priorities for conservation and research. *Endangered Species Research* 36: 229–267. (2) Demetropoulos, A., and M. Hadjichristophorou. 2010. Cyprus-Region B. In Casale, P., and D. Margaritoulis (eds.), *Sea Turtles in the Mediterranean: Distribution, Threats and Conservation Priorities*, pp. 53–64. IUCN, Gland, Switzerland.
Nesting Beaches: Chrysochou Bay, West Coast
Years: 2011–2015
Species and Counts: *Caretta caretta*—658 and 249 average clutches per year, respectively; *Chelonia mydas*—N/A and 108 average clutches per year, respectively

EGYPT

DATA RECORD 5

Data Source: Clarke, M., A. C. Campbell, C. Simms, and W. S. Hameld. 2002. Observations on the ecology of marine turtles nesting on the Mediterranean coast of Egypt. In Mosier, A., A. Foley, and B. Brost (compilers), *Proceedings of the Twentieth Annual Symposium on Sea Turtle Biology and Conservation*, pp. 257–258. NOAA Technical Memorandum NMFS-SEFSC-477, National Marine Fisheries Service, Miami, FL.
Nesting Beaches: Beaches between Rhafa and Port Said
Year: 1999
Species and Counts: *Caretta caretta*—27 clutches

FRANCE

DATA RECORD 9

Data Source: Sénégal, J.-B., S. Hochscheid, J.-M. Groul, B. Lagarrigue, and F. Bentivegna. 2009. Discovery of the northernmost loggerhead sea turtle (*Caretta caretta*) nest. *Marine Biodiversity Records* 2: 1–4.
Nesting Beach: St. Elme (St. Tropez)
Year: 2006
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Flegra Bentivegna

DATA RECORD 10

Data Source: Delaugerre, M., and C. Cesarini. 2004. Confirmed nesting of the loggerhead turtle in Corsica. *Marine Turtle Newsletter* 142: 17–18.
Nesting Beach: Palombaggia (Corsica)
Year: 2002
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Michel Delaugerre

GREECE

DATA RECORD 11

Data Source: Casale, P., A. Broderick, J. A. Camiñas, L. Cardona, C. Carreras, A. Demetropoulos, W. J. Fuller, B. J. Godley, S. Hochscheid, Y. Kaska, B. Lazar, D. Margaritoulis, A. Panagopoulou, A. F. Rees, J. Tomás, and O. Türközan. 2018. Mediterranean sea turtles: Current knowledge and priorities for conservation and research. *Endangered Species Research* 36: 229–267.
Nesting Beach: Southern Kyparissia Bay
Years: 2013–2015
Species and Counts: *Caretta caretta*—1,403 average clutches per year

DATA RECORD 12

Data Source: Casale, P., and D. Margaritoulis (eds.). 2010. *Sea Turtles in the Mediterranean: Distribution, Threats and Conservation Priorities*. IUCN, Gland, Switzerland.
Nesting Beaches: (1) Bay of Chania, (2) Bay of Messara, (3) Beaches adjacent to Kyparissia Town, (4) Koroni, (5) Kos Island, (6) Kotychi, (7) Lakonikos, (8) Lefkas Island
Year: 2010
Species and Counts: *Caretta caretta*—(1–6) 50–100, (7) >100, and (8) 50–100 average clutches per year

DATA RECORD 13

Data Source: Comis, C., and N. Vallianos. 2014. Loggerhead nesting in Kefalonia, Greece. Personal communication. In *SWOT Report—State of the World’s Sea Turtles*, vol. XIV (2019).
Nesting Beaches: (1) Kalamia, (2) Agia Kyriaki, (3) Agios Georgios, (4) Agios Ioannis, (5) Ai Chelis,

(6) Ammes, (7) Avithos, (8) Cape St. George, (9) Eglina, (10) Kanali, (11) Kounopetra, (12) Kouonupas, (13) Lepeda, (14) Loggos, (15) Lourdas, (16) Makris Gialos, (17) Megali Ammos, (18) Megali Petra, (19) Megas Lakkos, (20) Minies, (21) Palioistafida, (22) Platis Gialos, (23) Sissia, (24) St. Nicholas, (25) Trapazaki, (26) Vatsa, (27) Xi
Years: (1) 2014 and (2–27) 2018
Species and Counts: (1) 0, (2) 2, (3) 0, (4) 0, (5) 0, (6) 10, (7) 18, (8) 7, (9) 1, (10) 11, (11) 8, (12) 4, (13) 12, (14) 6, (15) 14, (16) 1, (17) 9, (18) 13, (19) 18, (20) 5, (21) 0, (22) 0, (23) 13, (24) 0, (25) 3, (26) 17, and (27) 1 clutches
SWOT Contact: Chanel Comis

DATA RECORD 14

Data Sources: (1) Casale, P., A. Broderick, J. A. Camiñas, L. Cardona, C. Carreras, A. Demetropoulos, W. J. Fuller, B. J. Godley, S. Hochscheid, Y. Kaska, B. Lazar, D. Margaritoulis, A. Panagopoulou, A. F. Rees, J. Tomás, and O. Türközan. 2018. Mediterranean sea turtles: Current knowledge and priorities for conservation and research. *Endangered Species Research* 36: 229–267. (2) Margaritoulis, D. 2000. An estimation of the overall nesting activity of the loggerhead turtle in Greece. In Abreu-Grobois, F. A., R. Briseño-Dueñas, R. Márquez, and L. Sarti (eds.), *Proceedings of the Eighteenth International Sea Turtle Symposium*, pp. 48–50. NOAA Technical Memorandum NMFSSEFSC-436, U.S. Dept. of Commerce.
Nesting Beach: Kerkyra Island
Year: 1990
Species and Counts: *Caretta caretta*—20 clutches

DATA RECORD 15

Data Sources: (1) Casale, P., A. Broderick, J. A. Camiñas, L. Cardona, C. Carreras, A. Demetropoulos, W. J. Fuller, B. J. Godley, S. Hochscheid, Y. Kaska, B. Lazar, D. Margaritoulis, A. Panagopoulou, A. F. Rees, J. Tomás, and O. Türközan. 2018. Mediterranean sea turtles: Current knowledge and priorities for conservation and research. *Endangered Species Research* 36: 229–267. (2) Margaritoulis, D. 2005. Nesting activity and reproductive output of loggerhead sea turtles, *Caretta caretta*, over 19 seasons (1984–2002) at Laganas Bay, Zakynthos, Greece: The largest rookery in the Mediterranean. *Chelonian Conservation and Biology* 4(4): 916–929. (3) Margaritoulis, D., A. F. Rees, C. J. Dean, and T. Riggall. 2011. Reproductive data of loggerhead turtles in Laganas Bay, Zakynthos Island, Greece, 2003–2009. *Marine Turtle Newsletter* 131: 2–6.
Nesting Beach: Laganas Bay (Zakynthos)
Years: 2005–2009
Species and Counts: *Caretta caretta*—938 average clutches per year

DATA RECORD 16

Data Sources: (1) Casale, P., A. Broderick, J. A. Camiñas, L. Cardona, C. Carreras, A. Demetropoulos, W. J. Fuller, B. J. Godley, S. Hochscheid, Y. Kaska, B. Lazar, D. Margaritoulis, A. Panagopoulou, A. F. Rees, J. Tomás, and O. Türközan. 2018. Mediterranean sea turtles: Current knowledge and priorities for conservation and research. *Endangered Species Research* 36: 229–267. (2) Margaritoulis, D., and A. Panagopoulou. 2010. Greece. In Casale, P., and D. Margaritoulis (eds.), *Sea Turtles in the Mediterranean: Distribution, Threats and Conservation Priorities*, pp. 85–112. IUCN, Gland, Switzerland.
Nesting Beaches: (1) Romanos, (2) Ipirou Coast, (3) Kythira Island, (4) Rhodes Island (SE), (5) Rhodes Island (SW), (6) SE Peloponnesus (Astro)
Years: (1, 4, 5) 1998–1999, (2, 3, 6) 1990
Species and Counts: *Caretta caretta*—(1) 25 average clutches per year, (2) 40 clutches, (3) 4 clutches, (4) 4 average clutches per year, (5) 11 average clutches per year, and (6) 16 clutches

DATA RECORD 17

Data Sources: (1) Casale, P., A. Broderick, J. A. Camiñas, L. Cardona, C. Carreras, A. Demetropoulos, W. J. Fuller, B. J. Godley, S. Hochscheid, Y. Kaska, B. Lazar, D. Margaritoulis, A. Panagopoulou, A. F. Rees, J. Tomás, and O. Türközan. 2018. Mediterranean sea turtles: Current knowledge and priorities for conservation and research. *Endangered Species Research* 36: 229–267. (2) Margaritoulis, D., and A. Rees. 2001. The Loggerhead Turtle, *Caretta caretta*, population nesting in Kyparissia Bay, Peloponnesus, Greece: Results of beach surveys over seventeen seasons and determination of the core nesting habitat. *Zoology in the Middle East* 24: 75–90.
Nesting Beach: Northern Kyparissia Bay
Years: 1985–1989
Species and Counts: *Caretta caretta*—102 average clutches per year
DATA RECORD 18
Data Sources: (1) Casale, P., A. Broderick,

J. A. Camiñas, L. Cardona, C. Carreras, A. Demetropoulos, W. J. Fuller, B. J. Godley, S. Hochscheid, Y. Kaska, B. Lazar, D. Margaritoulis, A. Panagopoulou, A. F. Rees, J. Tomás, and O. Türközan. 2018. Mediterranean sea turtles: Current knowledge and priorities for conservation and research. *Endangered Species Research* 36: 229–267. (2) Margaritoulis, D., R. Argano, I. Baran, F. Bentivegna, M. N. Bradal, J. A. Camiñas, P. Casale, G. De Metrio, A. Demetropoulos, G. Gerosa, B. J. Godley, D. A. Haddoud, J. Houghton, L. Laurent, and B. Lazar. 2003. Loggerhead turtles in the Mediterranean Sea: Present knowledge and conservation perspectives. In Bolten, A., and B. Witherington (eds.), *Loggerhead Sea Turtles*, pp. 175–198. Smithsonian Institution Press, Washington, DC.
Nesting Beach: Kefalonia (Mounda)
Years: 1993–1998
Species and Counts: *Caretta caretta*—29 average clutches per year

DATA RECORD 19

Data Sources: (1) Margaritoulis, D., A. F. Rees, and ARCHELON. 2007. Loggerhead nesting in Greece. In *SWOT Report—The State of the World’s Sea Turtles*, vol. II (2007). (2) Margaritoulis, D., A. F. Rees, and K. Grimanis. 2005. Monitoring work and conservation efforts for the loggerhead sea turtle nesting population in Laganas Bay, Zakynthos Island, Greece, during 2005. Unpublished report. ARCHELON, the Sea Turtle Protection Society of Greece, Athens.
Nesting Beach: Rethymnon
Years: *Caretta caretta*—2005; *Chelonia mydas*—2007
Species and Counts: *Caretta caretta*—166 clutches; *Chelonia mydas*—1 clutch
SWOT Contact: Dimitris Margaritoulis

ISRAEL

DATA RECORD 20

Data Source: Levi, Y. 2019. Personal communication. In Hochscheid, S., Y. Kaska, and A. Panagopoulou (eds.), *Sea Turtles in the Mediterranean Region*. MTSG Regional Report 2018.
Nesting Beaches: Carmel, Hasharon, Pleshet, Southern Coastal Plains, West Galil
Years: 2010–2017
Species and Counts: *Caretta caretta*—33, 34, 15, 23, and 15 average clutches per year, respectively; *Chelonia mydas*—2, 7, 2, 7, and <1 average clutches per year, respectively.

DATA RECORDS 21

Data Sources: (1) Casale, P., A. Broderick, J. A. Camiñas, L. Cardona, C. Carreras, A. Demetropoulos, W. J. Fuller, B. J. Godley, S. Hochscheid, Y. Kaska, B. Lazar, D. Margaritoulis, A. Panagopoulou, A. F. Rees, J. Tomás, and O. Türközan. 2018. Mediterranean sea turtles: Current knowledge and priorities for conservation and research. *Endangered Species Research* 36: 229–267. (2) Casale, P., G. Pallia, A. Salemi, A. Napoli, M. Prinzi, L. Genco, D. Bonaviri, A. Mastrogiacomo, M. Oliverio, and M. Lo Valvo. 2012. Exceptional sea turtle nest records in 2011 suggest an underestimated nesting potential in Sicily (Italy). *Acta Herpetologica* 7: 181–188. (3) ARCHELON. 2013. Ancora Giallonardo! Ecco il primo nido del 2012. ARCHELON blog, February 7, 2013. (4) Rini, G. 2012. Tartarughe marine, schiusa in Sicilia ripresa dal WWF. Ecoo. September 22, 2012. (5) WWF Italia. 2012. In Ciglia il primo nido di tartaruga marina segnalato grazie alla campagna ‘Segui le Tracce’ del WWF. WWF Italia, July 5, 2012.
Nesting Beach: Giallonardo
Year: 2012
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 22

Data Source: Bentivegna, F., M. B. Rasotto, A. De Lucia, E. Secci, M. Masaro, S. Panzera, C. Caputo, P. Carlino, G. Treglia, and S. Hochscheid. 2010. Loggerhead turtle (*Caretta caretta*) nests at high latitudes in Italy: A call for vigilance in the Western Mediterranean. *Chelonian Conservation and Biology* 9 (2): 283–289.
Nesting Beach: Cetraro Marina
Year: 2008
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 23

Data Source: Campese, C. 2012. Playa, tartaruga marina depone 45 uova. Volontari: “Non succedeva da 35 anni.” *CTZen*, August 11, 2012.
Nesting Beach: Lido Le Palme
Year: 2012
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 24

Data Sources: (1) Caputo, C. 2011. Diario di una nascita, anzi ottantasei. *Naturalia* 25: 10–14. (2) Management Consortium of Torre Guaceto.

2011. Comunicato stampa: Un nido di *Caretta caretta* nell’Area Marina Protetta Porto Cesareo. Area Marina Protetta Riserva Naturale dello Stato: Torre Guaceto.

Nesting Beach: Torre Lapillo

Year: 2011
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 25

Data Source: Caputo, C. 2012. Il nido di Palmitello (TA). *Naturalia* 30: 4–5.
Nesting Beach: Palmitello
Year: 2011
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 26

Data Source: Caputo, C. 2012. Salento terra di tartarughe Ficocchi rosa e azzurri sulla spiaggia di Torre Specchia! *Naturalia* 29: 4.
Nesting Beach: Torre S. Andrea
Year: 2012
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 27

Data Source: Casale, P. 2012. Loggerhead nesting at Costa Rei, Camping Capo Ferrato. Personal communication via Antonio T. Mingozi.
Nesting Beach: Costa Rei (Capo Ferrato)
Year: 2011
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 28

Data Source: Comunicalo. 2012. Le tartarughe *Caretta* ‘scoprono’ Ercule Minoa, nido ricco di uova recintato dal WWF. Comunicalo.it, July 25, 2012.
Nesting Beach: Capo Bianco
Year: 2012
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 29

Data Source: Curella, L. 2011. Una “*Caretta caretta*” nelle spiagge di marina di Ragusa. Ragusaoggi.
Nesting Beach: Marina di Ragusa (Piazza Torre)
Year: 2011
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 30

Data Source: De Lucia, A. 2010. Personal communication via www.sardegnambiente.it.
Nesting Beach: Funtanazza
Year: 2009
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 31

Data Source: Editorial Staff. 2011. A Sciacca si schiudono uova di *Caretta caretta*. *Staccia Today*, September 1, 2011.
Nesting Beach: Capo San Marco (Lido Cocoloco)
Year: 2011
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 32

Data Sources: (1) Editorial staff. 2012. Lampedusa, la tartaruga marina *Caretta caretta* è tornata a deporre le uova. BlogSicilia. (2) Editors. 2012. Isola dei Conigli, la *Caretta caretta* torna a nidificare sulle spiagge di Lampedusa. *ArgirentoNotizie*.
Nesting Beach: Conigli Beach
Year: 2012
Species and Counts: *Caretta caretta*—2 clutches
SWOT Contact: Antonio T. Mingozi

DATA RECORD 33

Data Source: Maffucci, F., R. Corrado, L. Palatella, M. Borra, S. Marullo, S. Hochscheid, G. Lacorata, and D. Iudicone. 2016. Seasonal heterogeneity of ocean warming: A mortality sink for ectotherm colonizers. *Scientific Reports* 6: 23983.
Nesting Beach: Baia Domitia
Year: 2002
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Flegra Bentivegna

DATA RECORD 34

Data Source: Bentivegna, F., M. B. Rasotto, G. A. De Lucia, E. Secci, G. Massaro, S. Panzera, C. Caputo, P. Carlino, G. Treglia, and S. Hochscheid. 2010. Loggerhead turtle (*Caretta caretta*) nests at high latitudes in Italy: A call for vigilance in the western Mediterranean. *Chelonian Conservation and Biology* 9 (2): 283–289.
Nesting Beaches: Geremeas (Cala Serena), Lucrino, Torre dell’Orso
Years: 2006, 2008, and 2006, respectively
Species and Counts: *Caretta caretta*—1 clutch at each beach
SWOT Contact: Antonio T. Mingozi

DATA RECORD 35

Data Source: Insacco, G., A. Barlotta, F. Bentivegna, D. Scaravelli, F. Spadola, and S. Hochscheid. 2011. Sicily 2010 nest season: Bad

weather and good news. In Bentivegna, F., F. Maffucci, and V. Mauriello (compilers), *Book of Abstracts: 4th Mediterranean Conference on Sea Turtles*, p. 78. Naples, Italy.

Nesting Beaches: (1) Cicerata, (2) Finale Torre Conche, (3) Marina di Noto, (4) Marzamemi
Year: 2010
Species and Counts: *Caretta caretta*—(1) 1, (2) 1, (3) 1, and (4) 2 clutches
SWOT Contact: Antonio T. Mingozi

DATA RECORD 36

Data Source: Libero Quotidiano. 2012. Animali: uova di tartaruga tra ombrelloni, squadre “salvavidri” in Salento. Libero Quotidiano, July 11, 2012.
Nesting Beach: Marina di Salve
Year: 2012
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 37

Data Source: Marzano, G., S. Nanarelli, and C. Scarafino. 2010. Documentata nidificazione di *Caretta caretta* lungo il litorale leccese (Puglia). In *Atti VIII Congresso nazionale Societas Herpetologica Italica*, pp. 559–562. Ianieri Edizioni, Pescara, Italy.
Nesting Beach: San Foca
Year: 2007
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 38

Data Source: Mazara Online. 2012. Tartaruga marine *Caretta caretta* nidifica sulla spiaggia di Tonnarella a Mazara. Mazara Online, August 3, 2012.
Nesting Beach: Banna Tonnarella
Year: 2012
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 39

Data Source: Micò, A. 2012. *Caretta caretta* nidifica nel Campomarino Beach. Personal communication, via Antonio T. Mingozi.
Nesting Beach: Campomarino
Year: 2011
Species and Counts: *Caretta caretta*—1 clutch
SWOT Contact: Antonio T. Mingozi

DATA RECORD 40

Data Sources: (1) Mingozi, T., G. Masciari, G. Paolillo, B. Pisani, M. Russo, and A. Massolo. 2007. Discovery of a regular nesting area of loggerhead turtle *Caretta caretta* in southern Italy: A new perspective for national conservation. *Biodiversity and Conservation* 16: 3519–3541. (2) Bentivegna, F., M. B. Rasotto, G. A. De Lucia, E. Secci, G. Massaro, S. Panzera, C. Caputo, P. Carlino, G. Treglia, and S. Hochscheid. 2010. Loggerhead turtle (*Caretta caretta*) nests at high latitudes in Italy: A call for vigilance in the western Mediterranean. *Chelonian Conservation and Biology* 9 (2): 283–289. (3) Maffucci, F., R. Corrado, L. Palatella, M. Borra, S. Marullo, S. Hochscheid, G. Lacorata, and D. Iudicone. 2016. Seasonal heterogeneity of ocean warming: A mortality sink for ectotherm colonizers. *Scientific Reports* 6.
Nesting Beach: Pelagian Archipelago
Year: 2008
Species and Counts: *Caretta caretta*—4 clutches

DATA RECORD 41

Data Source: Mingozi, T., and TartaCare Project. 2019. Loggerhead nesting in Italy. Personal communication. In *SWOT Report—State of the World’s Sea Turtles*, vol. XIV (2019).
Nesting Beaches: (1) Riace Marina, (2) Siderno, (3) Sant’Ilario dello Ionio, (4) Strait of Messina, (5) Siciliana Marina, (6) Pozzolina di Ponente, (7) Cassano Ionio, (8) Isola di Capo Rizzuto, (9) San Sostene, (10) Cirò Marina, (11) Crotona, (12) Costa degli Aranci, (13) Carliati Marina, (14) Chiaro, (15) Rovello, (16) Santa Caterina Ionio, (17) Costa dei Gelsomini
Years: (1) 2005, (2) 2006, (3–4) 2007, (5–9) 2008, (10–11) 2009, (12) 2010, and (13–17) 2012
Species and Counts: *Caretta caretta*—(1) 1, (2) 1, (3) 1, (4) 3, (5) 1, (6) 3, (7) 1, (8) 1, (9) 1, (10) 1, (11) 1, (12) 1, (13) 1, (14) 1, (15) 1, (16) 3, and (17) 13 clutches
SWOT Contact: Antonio T. Mingozi

DATA RECORD 42

Data Source: Casale, P., G. Pallia, A. Salemi, A. Napoli, M. Prinzi, L. Genco, D. Bonaviri, A. Mastrogiacomo, M. Oliverio, and M. Lo Valvo. 2012. Exceptional sea turtle nest records in 2011 suggest an underestimated nesting potential in Sicily (Italy). *Acta Herpetologica* 7 (1): 181–188.
Nesting Beaches: Acqua dei Corsari (Palermo), Porto Palo di Menfi, Punta Grande
Year: 2011
Species and Counts: *Caretta caretta*—1 clutch at each beach
SWOT Contact: Antonio T. Mingozi

DATA RECORD 43

Data Source: Hochscheid, S., and Stazione

Special Areas, Ankara, Turkey. (2) Kaska, Y., E. Başkale, and Ç. Fak. Unpublished project report. **Nesting Beaches:** Dalaman and Dalyan **Year:** 2011 **Species and Counts:** *Caretta caretta*—56 and 341 clutches, respectively. **SWOT Contact:** Yakup Kaska

DATA RECORD 69

Data Source: (1) Casale, P., A. Broderick, J. A. Camiñas, L. Cardona, C. Carreras, A. Demetropoulos, W. J. Fuller, B. J. Godley, S. Hochscheid, Y. Kaska, B. Lazar, D. Margaritoulis, A. Panagopoulou, A. F. Rees, J. Tomás, and O. Türkzoan. 2018. Mediterranean sea turtles: Current knowledge and priorities for conservation and research. *Endangered Species Research* 36: 229–267. (2) Oruç, A., O. Türkzoan, and S. Yerli. 2007. Conservation, research and monitoring of the Nile soft shell turtle (*Trionyx triunguis*) and marine turtle (*Caretta caretta*) populations at

Çıralı, Maden Bay, Beycik Cove, Boncuk Cove, Small Boncuk Bay and Tekirova Cove beaches. WWF, COB, 24. **Nesting Beach:** Çıralı **Years:** 1994–2006 and 2010 **Species and Counts:** *Caretta caretta*—86 average clutches per year

DATA RECORD 70

Data Source: Ergene, S., M. Ergene, A. H. Uçar, C. Aymak, and Y. Kaçar. 2016. Identification of a new nesting beach in Mersin, Turkey: Nesting activity of green and loggerhead sea turtles over 6 nesting seasons (2009–2014) at Davultepe Beach. *Marine Turtle Newsletter* 149: 6–9. **Nesting Beach:** Davultepe **Years:** *Caretta caretta*—2010–2014; *Chelonia mydas*—2010–2014 **Species and Counts:** *Caretta caretta*—5 average clutches per year; *Chelonia mydas*—113 average clutches per year

DATA RECORD 71

Data Sources: (1) Casale, P., A. Broderick, J. A. Camiñas, L. Cardona, C. Carreras, A. Demetropoulos, W. J. Fuller, B. J. Godley, S. Hochscheid, Y. Kaska, B. Lazar, D. Margaritoulis, A. Panagopoulou, A. F. Rees, J. Tomás, and O. Türkzoan. 2018. Mediterranean sea turtles: Current knowledge and priorities for conservation and research. *Endangered Species Research* 36: 229–267. (2) Türkzoan, O. 2000. Reproductive ecology of the loggerhead turtle, *Caretta caretta*, on Fethiye and Kizilot beaches, Turkey. *Chelonian Conservation Biology* 3: 686–692. **Nesting Beach:** Kizilot **Years:** 1994–1998 **Species and Counts:** *Caretta caretta*—138 average clutches per year

DATA RECORD 72

Data Sources: (1) Yalçın-Özdilek, Ş., and B. Sönmez. 2010. The nesting characteristics of

sea turtles on the Samandağ Beach, Turkey. In Blumenthal, J., A. Panagopoulou, and A. F. Rees (compilers), *Proceedings of the 30th Annual Symposium on Sea Turtle Biology and Conservation*, p. 148. (2) Yalçın-Özdilek, Ş., and B. Sönmez. 2011. Nesting characteristics at Samandağ and extended beaches, Turkey. *Marine Turtle Newsletter* 131: 7–9. (3) Casale, P., and D. Margaritoulis (eds.). 2010. Sea Turtles in the Mediterranean: Distribution, Threats and Conservation Priorities. IUCN, Gland, Switzerland. **Nesting Beach:** Samandag **Years:** *Caretta caretta*—2005; *Chelonia mydas*—2010 **Species and Counts:** *Caretta caretta*—15 clutches; *Chelonia mydas*—>100 average clutches per year **SWOT Contacts:** Şükran Yalçın-Özdilek, Çanakkale Onsekiz Mart University, and Bektaş Sönmez

TELEMETRY DATA CITATIONS

The following records refer to satellite telemetry datasets from tags that were deployed on sea turtles in the Mediterranean Sea, which were combined to create the maps on pages 28–29. These data were generously contributed to SWOT by the people and partners listed subsequently. Records that have a SWOT ID can be viewed in detail in the SWOT online database and mapping application at <http://seamap.env.duke.edu/swot>, which contains additional information about the projects and their methodologies.

To save space, we have used the following abbreviations in the data source fields below: (1) “STAT” refers to Coyne, M. S., and B. J. Godley. 2005. Satellite Tracking and Analysis Tool (STAT): An integrated system for archiving, analyzing and mapping animal tracking data. *Marine Ecology Progress Series* 301: 1–7; (2) “SWOT Online Database” refers to Kot, C. Y., E. Fujioka, A. DiMatteo, B. P. Wallace, B. J. Hutchinson, J. Cleary, P. N. Halpin, and R. B. Mast. 2015. The State of the World’s Sea Turtles Online Database: Data provided by the SWOT Team and hosted on OBIS-SEAMAP. Oceanic Society, IUCN Marine Turtle Specialist Group, and Marine Geospatial Ecology Lab, Duke University. <http://seamap.env.duke.edu/swot>; and (3) “OBIS-SEAMAP” refers to Halpin, P. N., A. J. Read, E. Fujioka, B. D. Best, B. Donnelly, L. J. Hazen, C. Kot, K. Urian, E. LaBrecque, A. DiMatteo, J. Cleary, C. Good, L. B. Crowder, and K. D. Hyrenbach. 2009. OBIS-SEAMAP: The world data center for marine mammal, sea bird, and sea turtle distributions. *Oceanography* 22 (2): 104–115. When listed, these sources indicate that the dataset was contributed online through STAT, SWOT, or OBIS-SEAMAP.

DATA RECORD 1 | SWOT ID: 982

Project Title: ADRIA-Watch Project **Project Partners:** Islameta Group; Department of Biology, University of Pisa and ADRIA-Watch **Metadata:** 5 juvenile, 1 adult, and 1 subadult *Caretta caretta*; tags deployed between 2006 and 2008 at sites throughout the northern Adriatic Sea. **Data Sources:** (1) Riccione, M. 2018. ADRIA-Watch project. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/982>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contact:** Marco Riccione

DATA RECORD 2 | SWOT ID: 1383

Project Title: Andalusia, Spain. Small loggerheads from a nest at Pulpi (Almería) **Project Partners:** Doñana Biological Station, Consejo Superior Investigaciones Científicas (CSIC); Universitat Politècnica de València; Unidad de Zoología Marina; Universidad de Valencia; Asociación Española de Herpetología; Environmental Office of Andalusia; Acuario de Sevilla; NGO Equinac; Fundación Hombre y Territorio **Metadata:** 9 juvenile *Caretta caretta*; tags deployed on headstarted turtles (<1 year old) in 2016–2017 that originated from a doomed nest in Pulpi, Andalusia, Spain, where they were also released. **Data Sources:** (1) Marco, A., and E. Belda. 2017. Andalusia, Spain. Small loggerheads from a nest at Pulpi (Almería). Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1383>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contacts:** Adolfo Marco and Eduardo Belda

DATA RECORD 3 | SWOT ID: 1680

Project Title: Bepi Project: Adriatic Sea **Project Partners:** Islameta Group; Department of Biology, University of Pisa; Research and Educational Activities for Chelonian Conservation (ARCHE), Ferrara, Italy; Istituto Zooprofilattico Sperimentale della Lombardia e dell’Emilia-Romagna “Bruno Ubertini,” Ferrara Section **Metadata:** 1 male *Caretta caretta* that had been injured and rehabilitated; tag deployed in 2003 from Porto Garibaldi, northern Italy. **Data Sources:** (1) Luschi, P. 2018. Bepi Project: Adriatic Sea. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1680>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contact:** Paolo Luschi

DATA RECORD 4 | SWOT ID: 1686

Project Title: CARESAT **Project Partners:** Islameta Group; Department of Biology, University of Pisa; Parco Regionale della Maremma (Maremma Regional Park) **Metadata:** 3 juvenile and 2 subadult *Caretta*

caretta; tags deployed on rehabilitated turtles in the waters of Tuscany, Italy, from 2014 to 2016. **Data Sources:** (1) Luschi, P. 2018. CARESAT. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1686>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contact:** Paolo Luschi

DATA RECORD 5 | SWOT ID: 1401

Project Title: Conservación y Preservación de Tortugas Marinas **Project Partners:** Fundación para la Conservación y Recuperación de Animales Marinos (CRAM), Universitat Politècnica de València **Metadata:** 3 juvenile and 3 adult *Caretta caretta*; tags deployed in Tarragona, Spain in 2016; dataset includes an adult male loggerhead that traveled across the Atlantic to waters east of Florida, U.S.A. **Data Sources:** (1) Fundación para la Conservación y Recuperación de Animales Marinos (CRAM). 2019. Conservación y preservación de tortugas marinas. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1401>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.

DATA RECORD 6 | SWOT ID: 1688

Project Title: Cyprus 2018 **Project Partners:** University of Exeter, Marine Turtle Research Group, Society for the Protection of Turtles (SPOT) **Metadata:** 10 *Caretta caretta* and 11 *Chelonia mydas*; tags deployed in 2018 on foraging turtles in Famagusta Bay, Northern Cyprus. **Data Sources:** (1) Exeter, R. 2019. Cyprus 2018. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1688>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contact:** Robin Exeter

DATA RECORD 7 | SWOT ID: 542

Project Title: First satellite tracking of sea turtles in Albania **Project Partners:** MEDASSET, Albanian Herpetofauna Society, University of Tirana **Metadata:** 3 subadult *Caretta caretta*; tags deployed on turtles that had been incidentally captured in the Patok area of Albania. **Data Sources:** (1) Venizelos, L. 2017. First satellite tracking of sea turtles in Albania. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/542>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contact:** Lily Venizelos

DATA RECORD 8 | SWOT ID: 1822

Project Title: Green Turtles in Syria **Project Partner:** ARCHELON, the Sea Turtle Protection Society of Greece **Metadata:** 1 adult *Chelonia mydas*; tag deployed on a post-nesting female turtle in Latakia Beach, Syria in 2006.

Data Sources: (1) Rees, A. 2018. Green turtles in Syria. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1822>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contact:** Alan Rees

DATA RECORD 9 | SWOT ID: 1185

Project Title: Israel’s sea turtle monitoring program **Project Partners:** Israel National Nature and Parks Authority, Sea Turtle Rescue Center **Metadata:** 16 *Caretta caretta* and 3 *Chelonia mydas*; tags deployed on rehabilitated turtles in Israel between 2014 and 2018. **Data Sources:** (1) Israel Center. 2019. Israel’s sea turtle monitoring program. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1185>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.

DATA RECORD 10 | SWOT ID: 1816

Project Title: Loggerhead satellite tracking data from Rethymno, Crete, Greece **Project Partners:** Samir Patel, Drexel University; Coonamessett Farm Foundation **Metadata:** 21 *Caretta caretta*; tags deployed on post-reproductive turtles (20 female and 1 male) in Rethymno, Crete, Greece during 2010 and 2011; only 20 tags transmitted successfully. **Data Sources:** (1) Patel, S. H., S. J. Morreale, A. Panagopoulou, H. Bailey, N. J. Robinson, F. V. Paladino, D. Margaritoulis, and J. R. Spottila. 2015. Change point analysis: A new approach for revealing animal movements and behaviors from satellite telemetry data. *Ecosphere* 12: 1–13. (2) OBIS-SEAMAP. **SWOT Contact:** Samir Patel

DATA RECORD 11 | SWOT ID: 980

Project Title: Loggerheads in the Adriatic Sea **Project Partners:** Islameta Group; Department of Biology, University of Pisa; Research and Educational Activities for Chelonian Conservation (ARCHE), Ferrara, Italy; Istituto Zooprofilattico Sperimentale della Lombardia e dell’Emilia-Romagna “Bruno Ubertini,” Ferrara Section **Metadata:** 2 adult and 1 juvenile *Caretta caretta*; tags deployed in the Adriatic Sea in 2004 and 2010. **Data Sources:** (1) Luschi, P. 2018. Loggerheads in the Adriatic Sea. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/980>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contact:** Paolo Luschi

DATA RECORD 12 | SWOT ID: 1682

Project Title: Loggerheads in the Tyrrhenian Sea **Project Partners:** Islameta Group; Department of Biology, University of Pisa; Centro Recupero Tartarughe Marine; Acquario di Grosseto (Italy)

Metadata: 7 juvenile and 2 adult *Caretta caretta*; tags deployed on turtles off the coast of Tuscany, Italy from 2005 to 2016.

Data Sources: (1) Islameta Group and Department of Biology, University of Pisa. 2018. Loggerheads in the Tyrrhenian Sea. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1682>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contact:** Paolo Luschi

DATA RECORD 13 | SWOT ID: 1294

Project Title: North Cyprus 2015: Green Turtles **Project Partners:** Marine Turtle Research Group, MEDASSET, Albanian Herpetofauna Society, University of Tirana, United Nations Environment Programme, Regional Activity Centre for Specially Protected Areas (RAC/SPA) of UNEP/MAP, British Chelonia Group

Metadata: 2 male subadult *Caretta caretta*; tags deployed in 2009 on individuals caught in fishing nets.

Data Sources: (1) Bradshaw, P. 2018. North Cyprus 2015: Green Turtles. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1294>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contact:** Lily Venizelos

DATA RECORD 14 | SWOT ID: 1921

Project Title: North Cyprus 2017 **Project Partners:** Marine Turtle Research Group, Society for the Protection of Turtles in Northern Cyprus (SPoT) **Metadata:** 10 adult *Caretta caretta*; tags deployed in mid-2017 and mid-2018 on nesting females on Alagadi Beach, Cyprus. **Data Sources:** (1) Hayward, J. 2018. North Cyprus 2017. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1921>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contact:** Julia Hayward

DATA RECORD 15 | SWOT ID: 1897

Project Title: Northern Cyprus 2004: Loggerhead & Green Turtles **Project Partners:** Marine Turtle Research Group, Society for the Protection of Turtles in Northern Cyprus (SPoT) **Metadata:** 4 adult *Chelonia mydas* and 1 adult *Caretta caretta*; tags deployed in 2003 and 2004. **Data Sources:** (1) Broderick, A. 2018. Northern Cyprus 2004: Loggerhead & Green Turtles. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1897>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP. **SWOT Contact:** Annette Broderick

DATA RECORD 16 | SWOT ID: 1899

Project Title: Northern Cyprus 2005: Loggerhead Turtles

Project Partners: Marine Turtle Research Group, Society for the Protection of Turtles in Northern Cyprus (SPoT)
Metadata: 3 adult *Caretta caretta*; tags deployed in 2005.
Data Sources: (1) Broderick, A. 2018. Northern Cyprus 2005: Loggerhead Turtles. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1899>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Annette Broderick

DATA RECORD 17 | SWOT ID: 1901
Project Title: Northern Cyprus 2006–2008: Loggerhead Turtles
Project Partners: Marine Turtle Research Group, Society for the Protection of Turtles in Northern Cyprus (SPoT)
Metadata: 6 adult *Caretta caretta*; 3 tags deployed in 2006, 2 in 2007, and 1 in 2008.
Data Sources: (1) Broderick, A. 2018. Northern Cyprus 2006–2008: Loggerhead Turtles. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1901>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Annette Broderick

DATA RECORD 18 | SWOT ID: 1909
Project Title: Northern Cyprus 2009
Project Partners: Marine Turtle Research Group, Society for the Protection of Turtles in Northern Cyprus (SPoT)
Metadata: 6 adult *Caretta caretta* and 1 adult *Chelonia mydas*; tags deployed in 2009.
Data Sources: (1) Broderick, A. 2018. Northern Cyprus 2009. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1909>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Annette Broderick

DATA RECORD 19 | SWOT ID: 1911
Project Title: Northern Cyprus 2010
Project Partners: Marine Turtle Research Group, Society for the Protection of Turtles in Northern Cyprus (SPoT)
Metadata: 6 *Chelonia mydas*; tags deployed in June and July of 2010 on nesting females.
Data Sources: (1) Broderick, A. 2018. Northern Cyprus 2010. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1911>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Annette Broderick

DATA RECORD 20 | SWOT ID: 1913
Project Title: Northern Cyprus 2012
Project Partners: Marine Turtle Research Group, Society for the Protection of Turtles in Northern Cyprus (SPoT); Biological Sciences Department, Eastern Mediterranean University
Metadata: 5 adult *Caretta caretta*; tags deployed in June and July of 2012.
Data Sources: (1) Broderick, A. 2018. Northern Cyprus 2012. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1913>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Annette Broderick

DATA RECORD 21 | SWOT ID: 1684
Project Title: Rehabilitated Loggerhead from Southern Italy
Project Partners: Islameta Group; Department of Biology, University of Pisa
Metadata: 1 adult *Caretta caretta*; tag deployed on a rehabilitated turtle that was released at the Brancaleone beach, Reggio Calabria.
Data Sources: (1) Italy, D. 2018. Rehabilitated loggerhead from southern Italy. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1684>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Paolo Luschi

DATA RECORD 22 | SWOT ID: 1846
Project Title: Rethymno Nesting Turtle
Project Partner: ARCHELON, the Sea Turtle Protection Society of Greece
Metadata: 1 adult *Caretta caretta*; tag deployed in 2005.
Data Sources: (1) Rees, A. 2018. Rethymno Nesting Turtle. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1846>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Alan Rees

DATA RECORD 23 | SWOT ID: 1550
Project Title: Seguimiento de 10 Crías de Tortuga Boba Nacidas en 2016 en el Litoral Balenciano,

en el Marco del Proyecto LIFE 15 IPE ES 012
Project Partners: LIFE IP Intemares; Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente (Spain)
Metadata: 10 *Caretta caretta* hatchlings; tags deployed on hatchlings from a nest found in Las Palmeras in Sueca (Valencia) in 2016, which were transferred and released on the protected beach of La Punta (Parc Natural de l'Albufera).
Data Sources: (1) Belda, E. 2018. Seguimiento de 10 crías de tortuga boba nacidas en 2016 en el litoral valenciano, en el marco del Proyecto LIFE 15 IPE ES 012. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1550>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Eduardo Belda

DATA RECORD 24 | SWOT ID: 1146
Project Title: Spain Tags Merged
Project Partners: Fisheries Bycatch Research Group, NOAA, Kai Submon, UNCW
Metadata: 1 adult, 5 juvenile, and 20 subadult *Caretta caretta*; tags deployed between 2008 and 2012.
Data Sources: (1) Swimmer, Y. 2017. Spain tags merged. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1146>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Yonat Swimmer

DATA RECORD 25 | SWOT ID: 1310
Project Title: Spain-Balearic Islands 2015 Loggerhead Turtles
Project Partners: Fisheries Bycatch Research Group
Metadata: 2 subadult and 2 juvenile *Caretta caretta*; tags deployed in June and July of 2016.
Data Sources: (1) Swimmer, Y. 2018. Spain-Balearic Islands 2015 loggerhead turtles. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1310>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Yonat Swimmer

DATA RECORD 26 | SWOT ID: 1820
Project Title: Telemetry of Loggerhead Turtles in Amvrakikos Bay
Project Partners: ARCHELON, the Sea Turtle Protection Society of Greece; Etanam (a local management agency of the Amvrakikos Bay region)
Metadata: 1 subadult, 2 adult, and 3 unknown-life-stage *Caretta caretta*; tags deployed in 2002 and 2003.
Data Sources: (1) Rees, A. 2018. Telemetry of loggerhead turtles in Amvrakikos Bay. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1820>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Alan Rees

DATA RECORD 27 | SWOT ID: 1314
Project Title: Tracking Small Loggerheads from Spanish Nests
Project Partners: Universitat Politècnica de València; Unidad de Zoología Marina, Universidad de Valencia (Spain); Research Institute Doñana Biological Station, CSIC; Fundación para la Conservación y Recuperación de Animales Marinos (CRAM); Generalitat Valenciana; Junta de Andalucía; Oceanográfico de Valencia; Acuario de Sevilla; Xaloc Hermanos de Sal.
Metadata: 8 small-juvenile and 21 juvenile *Caretta caretta*; turtles born in Valencia (Spain) and Catalonia from natural nests found in Spain in 2014, Andalusia in 2015, and Valencia in 2016. The eggs were translocated, and the hatchlings were headstarted in five different centers.
Data Sources: (1) Belda, E. 2017. Tracking small loggerheads from Spanish nests. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1314>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Eduardo Belda

DATA RECORD 28 | SWOT ID: 1826
Project Title: WWF Italy
Project Partners: Sea Turtle Network, WWF Italy
Metadata: 10 adult *Caretta caretta*; tags deployed in 2006, 2007, and 2009.
Data Sources: (1) Casale, P. 2018. WWF Italy. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1826>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Paolo Casale

DATA RECORD 29 | SWOT ID: 1834
Project Title: WWF Italy–Manfredonia
Project Partners: WWF Italy; Centro Cultura del Mare Associazione di Promozione Sociale (APS); Lega Navale di Manfredonia; University of Rome la Sapienza
Metadata: 3 juvenile and 2 subadult *Caretta*

caretta; individuals were incidentally caught by trawlers fishing in the Gulf of Manfredonia.
Data Sources: (1) Casale, P. 2018. WWF Italy–Manfredonia. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1834>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Paolo Casale

DATA RECORD 30 | SWOT ID: 1903
Project Title: Zakyntos 2007: Loggerhead Turtles
Project Partners: Marine Turtle Research Group; ARCHELON, the Sea Turtle Protection Society of Greece
Metadata: 11 adult *Caretta caretta*; tags deployed in July 2007.
Data Sources: (1) Zbinden, J. 2018. Zakyntos 2007: Loggerhead Turtles. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1903>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Judith Zbinden

DATA RECORD 31 | SWOT ID: 1923
Project Title: Zakyntos Nesting Turtles
Project Partners: Division of Conservation Biology (Judith Zbinden, Adrian Aebischer, Raphael Arlettaz) of the University of Bern, Switzerland; ARCHELON, the Sea Turtle Protection Society of Greece
Metadata: 6 *Caretta caretta*; tags deployed in 2004. The turtles tracked in this project are among the first loggerheads to be tracked during their post-nesting migration from a Greek nesting beach.
Data Sources: (1) Rees, A. 2018. Zakyntos Nesting Turtles. Data downloaded from OBIS-SEAMAP (<http://seamap.env.duke.edu/dataset/1923>) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.
SWOT Contact: Alan Rees

DATA RECORD 32
Project Title: Habitat Use by Foraging Sea Turtles in the Mediterranean
Project Partners: Stazione Zoologica Anton Dohrn, Marine Turtle Research Center
Metadata: 1 juvenile, 3 subadult, and 2 adult *Caretta caretta*; tags deployed in 2013 and 2014.
Data Sources: (1) Hochscheid, S., Marine Turtle Research Center, Stazione Zoologica Anton Dohrn, Naples, Italy. Unpublished data. (2) Uçar, A. H., F. Maffucci, S. Ergene, M. Ergene, Y. Katilmiş, E. Başkale, Y. Kaska, and S. Hochscheid. A stranded loggerhead turtle tracked with satellite in Mersin Bay, eastern Mediterranean Sea, Turkey. *Marine Turtle Newsletter*, under review. (3) STAT.

DATA RECORD 33
Project Title: SZN: Movements of Rehabilitated Sea Turtles
Project Partners: Stazione Zoologica Anton Dohrn; Bagnoliifutura; The Sea Turtle Rescue Center (DEKAMER); Centro Regionale di Recupero Fauna Selvatica e Tartarughe Marine, Comisio, Sicily
Metadata: 2 juvenile *Lepidochelys kempii*; 1 juvenile, 2 subadult, and 5 adult *Caretta caretta*; and 1 adult *Chelonia mydas*. Tags deployed on 10 rehabilitated and 1 hand-reared individual between 2008 and 2014.
Data Sources: (1) Hochscheid, S., Marine Turtle Research Center, Stazione Zoologica Anton Dohrn, Naples, Italy. Unpublished data. (2) Luschi, P., R. Mencacci, G. Cerritelli, L. Papetti, and S. Hochscheid. 2018. Large-scale movements in the oceanic environment identify important foraging areas for loggerheads in central Mediterranean Sea. *Marine Biology* 165: 4. (3) STAT.

DATA RECORD 34
Project Title: RAC/SPA-SZN Tracking of Mediterranean Marine Turtles
Project Partners: UNEP/MAP Regional Activity Centre for Specially Protected Areas (RAC/SPA); Malta Environment and Planning Authority (MEPA); Environmental General Authority (EGA), Libya; Marine Biology Research Centre (MBRC), Tajura; The Sea Turtle Rescue Center (DEKAMER); The Tyre Coast Nature Reserve (TCNR)
Metadata: 3 juvenile, 1 subadult, and 11 adult *Caretta caretta*; and 2 adult *Chelonia mydas*. Tags deployed between 2006 and 2013.
Data Sources: (1) Hochscheid, S., A. Saied, A. Hamza, A. Ouerghii, F. Bentivegna, Y. Kaska, F. Maffucci, N. Dakik, I. Jribi, M.N. Bradai, C. Mifsud, and Y. Levy. 2018. RAC/SPA-SZN Tracking of Mediterranean Marine Turtles. Personal communication in *SWOT Report—State of the World's Turtles*, vol. XIV (2019) (2) STAT.

DATA RECORD 35
Metadata: 6 *Caretta caretta*.
Data Source: Casale, P., A. C. Broderick, D. Freggi, R. Mencacci, W. J. Fuller, B. J. Godley, and P. Luschi.

2012. Long-term residence of juvenile loggerhead turtles to foraging grounds: A potential conservation hotspot in the Mediterranean. *Aquatic Conservation: Marine and Freshwater Ecosystems* 22: 144–154.
SWOT Contact: Paolo Casale

DATA RECORD 36
Metadata: 3 *Caretta caretta*.
Data Source: Luschi, P., R. Mencacci, C. Vallini, A. Ligas, P. Lambardi, and S. Benvenuti. 2013. Long-term tracking of adult loggerhead turtles (*Caretta caretta*) in the Mediterranean Sea. *Journal of Herpetology* 47: 227–231.
SWOT Contacts: Paolo Luschi and Resi Mencacci

DATA RECORD 37
Metadata: 3 *Caretta caretta*.
Data Source: Mencacci, R., A. Ligas, P. Meschini, and P. Luschi. 2011. Movements of three loggerhead sea turtles in Tuscany waters. *Atti della Società Toscana di Scienze Naturali, Serie B*, 118: 117–120.
SWOT Contacts: Paolo Luschi and Resi Mencacci

DATA RECORD 38
Metadata: 4 *Caretta caretta*.
Data Source: Luschi, P., R. Mencacci, G. Cerritelli, L. Papetti, and S. Hochscheid. 2018. Large-scale movements in the oceanic environment identify important foraging areas for loggerheads in central Mediterranean Sea. *Marine Biology* 165: 4. (3) STAT.
SWOT Contacts: Paolo Luschi and Resi Mencacci

DATA RECORD 39
Metadata: 3 *Caretta caretta*.
Data Source: Casale, P., A. C. Broderick, D. Freggi, R. Mencacci, W. J. Fuller, B. J. Godley, and P. Luschi. 2012. Long-term residence of juvenile loggerhead turtles to foraging grounds: A potential conservation hotspot in the Mediterranean. *Aquatic Conservation: Marine and Freshwater Ecosystems* 22: 144–154.
SWOT Contacts: Paolo Luschi and Resi Mencacci

DATA RECORD 40
Metadata: 4 *Caretta caretta*.
Data Source: Mingozzi, T., R. Mencacci, G. Cerritelli, D. Giunchi, and P. Luschi. 2016. Living between widely separated areas: Long-term monitoring of Mediterranean loggerhead turtles sheds light on cryptic aspects of females spatial ecology. *Journal of Experimental Marine Biology and Ecology* 485: 8–17.
SWOT Contacts: Paolo Luschi and Resi Mencacci

DATA RECORD 41
Metadata: 4 *Caretta caretta*.
Data Source: Mencacci, R., and P. Luschi. 2018. Unpublished tracks. Personal communication in *SWOT Report—State of the World's Turtles*, vol. XIV (2019).
SWOT Contacts: Paolo Luschi and Resi Mencacci

DATA RECORD 42
Project Partner: Pamukkale University Sea Turtle Rescue Center (DEKAMER)
Metadata: 15 *Caretta caretta*.
Data Sources: (1) Sezgin, C. 2016. Investigation of the effects of temperature on the sex of loggerhead sea turtle (*Caretta caretta* L.) hatchlings and migration patterns of adults. MSc thesis. Pamukkale University Institute of Science, Denizli, Turkey. (2) Kaska, Y., and D. Sözbilen. 2018. Unpublished data. Deniz Kaplumbagalari Arastirma Merkezi (DEKAMER), Pamukkale University.
SWOT Contact: Yakup Kaska

DATA RECORD 43
Metadata: 57 *Caretta caretta*.
Data Source: Schofield, G., A. Dimadi, S. Fossette, K. A. Katselidis, D. Koutsoubas, M. K. S. Lilley, A. Luckman, J. D. Pantis, A. D. Karagouni, and G. C. Hays. 2013. Satellite tracking large numbers of individuals to infer population level dispersal and core areas for the protection of an endangered species. *Diversity and Distributions* 19 (7): 834–844.
SWOT Contact: Gail Schofield

DATA RECORD 44
Metadata: 1 adult *Caretta caretta*. Tag deployed on a rehabilitated individual.
Data Source: (1) Luschi, P., R. Mencacci, G. Cerritelli, L. Papetti, and S. Hochscheid. 2018. Large-scale movements in the oceanic environment identify important foraging areas for loggerheads in central Mediterranean Sea. *Marine Biology* 165: 4. (2) Hochscheid, S., F. Bentivegna, A. Hamza, and G.C. Hays. 2010. When surfacers do not dive: Multiple significance of extended surface times in marine turtles. *Journal of Experimental Biology* 213: 1328–1337.

OTHER CITATIONS

Description: Loggerhead Turtle Foraging Areas

Data Source: Mazar, T., M. Beger, J. McGowan, H. Possingham, and S. Kark. 2016. The value of migration information for conservation prioritization of sea turtles in the Mediterranean. *Global Ecology and Biogeography* 25 (5): 540–552.