



AFRICAN SEA TURTLE NEWSLETTER



In Morocco, turtle bycatch is recorded by fishermen collaborating with ATOMM, the Moroccan sea turtle project.

photo: © ATOMM

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Foreword: The African Sea Turtle Newsletter #2

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Since the launch of the newsletter in February 2014, the world has changed in many ways and perhaps one of the most frightening is the outbreak of Ebola affecting our sea turtle colleagues in West Africa. While the international sea turtle community has been worrying about the health and safety of colleagues in these countries, they have been worrying about continued funding from their donors. For them life and work still go on and, now more than ever, they turn to their supporters for continued faith in their ability to conserve sea turtles despite yet another formidable obstacle in the challenging world of African conservation.

In the midst of these difficult times, I share with deep sadness the passing of Ibrahim Boima from the Sierra Leone sea turtle project. Ibrahim was hired as a driver for the project, but his contribution extended far beyond his designated role and he became one of the pillars that sustained the project. He was one of those people who, regardless of background, had an innate wisdom about life and priorities. It has been a privilege for me to have known and worked with him. He will be much missed by many! Please read more about him by his project leader, Edward Aruna, at the end of this newsletter.

I take this opportunity to encourage projects in Africa to solicit and submit the views and opinions of the many people who, like Ibrahim, form the nuts and bolts of projects, but often do not share their thoughts with the international sea turtle community.

Finally, we would like to thank everyone for their encouraging response to the inaugural issue of the African Sea Turtle Newsletter. All the people involved in compiling this newsletter have accommodated this “one more thing to do” generously into their busy working lives, and so your warm response meant a lot to us all.



GUEST EDITORIAL

Reminiscences of Turtles

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In the adventures of Alice in Wonderland, the King ordered the White Rabbit to begin at the beginning and go on till the end: then stop. Great advice, but not always easy to follow! Where did it begin with turtles? Receding through a kaleidoscope of memories, can I glimpse the beginning?

Was it Maziwi, off the Pangani River in northern Tanzania, where Ali would take me in his *ngalawa* (a traditional, single or double-outrigger canoe commonly used by fishing people in the western Indian Ocean)? In 20 minutes I could walk round the island, checking for turtle nests: greens on open beach, hawksbills under the bushes, both frequent. One morning an olive ridley nested: a 3rd species. When bored of my rations, I'd snorkel out and catch a lobster for dinner. Life was great! Charlie Chaplin was knighted by Elizabeth II – it was 1975. Then some years later Maziwi washed away, the best nesting area in Tanzania, was left to memories.

Perhaps it was earlier, on the vast beaches of Ungwana Bay, in Kenya, a major green turtle nesting area cut by the Tana River and punctuated by old Arab ruins. We arrived by Piper Cub; the beaches were great for landing the small plane. I'd walk several hours recording nest spoor then Tim would pick me up and fly to a village with a landing strip until the next morning. It was wonderful. Once I spotted an odd shell; we landed and found the remains of an olive ridley. Forget the smell, what a treasure! The first record for Kenya! But how to get it back? Tim opened a flap in the fuselage, trussed the prize inside the frame, and took off alone to test the extra weigh in the back. Air cargo was never so good! Then one of the last flights we had an "extra" adventure. I'd been at the pickup site

in the middle of nowhere for over an hour but no Tim. About sunset the little plane appeared just in time! Hours before, at the other end of the long beach, he had taxied to come get me, but the wheels sunk in soft sand from the rising tide. He frantically dug out, taxied a little up the beach, dug out again, and so on until he could finally take off before the rising tide got him. Airplanes shouldn't be on beaches!

Boats are more reliable! A few years earlier a rented outrigger enabled me to sail round Mayotte, the most easterly of the Comoro Islands, visit each beach to check for nesting and spend nights camped out. In the south, Saziley Pass had to be approached very carefully because of its tidal surge. But several days of hard rain stopped my trip, and I camped under a fallen baobab for shelter. When the rain finally broke the eagerness of getting back in my outrigger erased all previous careful planning. A strong ebb tide caught me as I reached the Pass and I was swept out. After an eternity paddling furiously, huge breakers crashing just to my right, the tide slacked and I creep back in to the lagoon. At the first beach I pulled up the boat and collapsed in the sand. In the end, after all the effort (and fun), there was little sign of nesting on Mayotte. But I had a special experience off Pamanzi, in the north west of Mayotte, where I camped for a week. One day, as I swam close to mating green turtles, an excited male appearing out of the blue to inspect me. Had

he courted me it would have been very dangerous – for me! But, it might have been seen as justice by locals; an elder later confided that they thought I lived alone on the beach to kidnap children and make magic potents from their livers.

Mayotte's meager nesting was balanced a month earlier by huge numbers of nesting green turtles on Moheli (the smallest of the Comoro islands), particularly at Itsamia. The village is special, and not just because the ladies gave me a celebration dance my last night, but it's a turtle paradise and this is thanks to Itsamians protecting turtles. In addition, the days spent alone paddling an outrigger canoe that I borrowed in Fomboni village, farther to the west, were also special. I vividly remember a large hawksbill surfacing 2 metres from my boat in deep water, breathing deeply and disappearing as suddenly as it had appeared. The islands south of Fomboni had good nesting, and now these are part of the national marine park.

But of all islands, Aldabra stands out. I was there to study the giant tortoises; sea turtles were a hobby! With Harry Charles, and other Seychellois assistants, I visited nearly all beaches. We tagged and measured turtles; we caught hawksbills in the lagoon; there wasn't much we didn't do. Harry took notes on nesting beaches every morning – not bad for someone who could hardly write his name. He was my teacher; what he knew

about turtles would fill several books. Before it was prohibited, we ate green and hawksbill meat. My beard was red and full then, but I have scars on my legs from the powerful flippers of the first female green turtle that I turned; I was nowhere near as adept as Harry. The world's attention was on the Grenoble Olympics – it was 1968, but mine was on these amazing reptiles from the sea. Yes, that was the beginning!



Jack Frazier on Cousin Island, Seychelles, in 1970 (*Photo: Tony Diamond*)



Engaging Indigenous People in Sea Turtle Conservation in Sierra Leone

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Sea turtle conservation in Sierra Leone started in the early 2000s with field activities that listened respectfully to the views and cries of local coastal communities. A socioeconomic survey in the coastal communities was believed to be an invaluable ingredient for initiating a conservation program; therefore, it was used as the entry point to address sea turtle issues that were not particularly addressed in Sierra Leone. This effort laid the foundation upon which the current program continues to build and create an unbelievable impact in most coastal communities.

Before 2000, little was known about sea turtles in Sierra Leone, but a student research project by Edward Aruna threw some light on the number of species the country is hosting and the threats they are facing.

Having realized the information gap about these species and the need to address the threats, the Sea Turtle Conservation Program of Sierra Leone (STCP-SL) was conceived in 2003. The first task undertaken by STCP-SL was to survey the entire coastline of Sierra Leone with funds from the US Fish and Wildlife Service (USFWS) in 2006. The methodology included the use of structured questionnaires aimed at collecting data on sea turtles (species, threats, nesting beaches, carapace observations), the socioeconomic status of the coastal indigenous people, the use of sea turtles, community needs, and the awareness of international laws protecting sea turtles; communities with the most sea turtle interactions were also determined. This information was considered invaluable in understanding the issues and causes, and finding the means of addressing them.



This survey confirmed the presence of the five sea turtles species—green turtle (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), olive ridley (*Lepidochelys olivacea*), leatherback (*Dermochelys coriacea*) and loggerhead (*Caretta caretta*)—through carapace collection and identification. In some communities, encountering both dead and live turtles was an added advantage in the determination of species. Threats noted included sand mining, fishing (active and ghost fishing), egg collection, nesting beach erosion, dumping of plastics into the sea, oil spillage and the limited awareness of locals of wildlife laws protecting threatened and endangered species in the country.

The presence of more than 50 nesting beaches in over 70 fishing communities were also noted through interviews. To identify communities with the greatest sea turtle interactions, the number of carapaces recovered and the importance of nesting beaches were considered a guide for further verification.



The socioeconomic aspect of the survey paid attention to the daily activities of the indigenous people and delved into trying to understand why they do the things they do and what would happen incase there is a call for a shift in attention from any of the turtle related activities. Their responses were generally 70% negative and 30% in-between since the majority were fishermen and fishmongers. In some communities the idea of

addressing community needs was suggested and the STCP-SL made it known that it cannot address individual needs except in exceptional/critical circumstances. Community-needs assessment became a priority because STCP-SL considered it an entry point to engage locals in sea turtle conservation — it was based on the philosophy that no matter how small the need, once it is addressed an impact is always created. This was carefully handled in order to prevent raising the hopes of the people.

It was found that carapaces were cherished ornaments where as the meat and eggs were protein supplements. All captures of turtles in Sierra Leone were accidental and during those years once a turtle was captured, it would be heading to supply the demand for meat and its carapace used as raw materials for the ornament industry.



The survey also revealed that though the wildlife law of the country included threatened and endangered species of flora and fauna as protected species, coastal indigenes had no knowledge about the laws protecting sea turtles in Sierra Leone nor about threatened and endangered species.

Having collected all this information, STCP-SL shared the survey results with the relevant government ministries including the Ministry of Fisheries and Marine Resources and the Wildlife Conservation Unit at the Ministry of Agriculture, Forestry and Food Security.

Stakeholder workshops were conducted in Freetown, the capital of Sierra Leone, and subsequently the sea turtle conservation campaign started within the coastal communities of Freetown. Starting the campaign in the city was later noted to be advantageous although it was initially done based on STCP-SL's limited resources. The education and sensitization effort allowed turtle task force groups to be set up at some main fish landing sites around the city and from there the news spread and the awareness started growing. Results from the turtle task force groups were used to determine which community(ies) is/are cooperating, which sea turtle species are being caught in the artisanal fisheries, and where assistance can be directed.



coastal communities of Sierra Leone. In the city, government offices, embassies, hotels, guesthouses, educational institutions and NGOs are mostly targeted.



For the community development component, STCP-SL always revisits previous records on community needs and conducts a rapid assessment of present needs in order to prioritize possible areas of intervention based on the available funds. Out of this, STCP-SL has constructed a school, eco-lodges, community centers and provided support to fishing communities with rolls of threads for mending nests torn by turtles (on the condition that the turtle is reported alive) and materials including cement where needed for construction, zinc for roofs and stationery to schools. STCP-SL has also paid the vocational fees for coastal community indigenes studying in Freetown.

Since 2008, with the cooperation of the indigenous people, the project has grown tremendously and STCP-SL has recorded a total of 511 turtle nests on its monitored beaches resulting in the release of about 21,838 hatchlings; all five species have been recorded nesting on the beaches with olive ridleys nesting on almost all beaches and laying the greatest number of nests in Sierra Leone. In collaboration with the artisanal fishermen, STCP-SL has released over 1000 sea turtles, primarily green turtles.

As an annual event, STCP-SL produces calendars, T-shirts, brochures and training manuals. These materials are distributed mainly in the capital city, Freetown, and in the



Turtle Island School (From Grass to Grace)

Conservation has always been and will remain an issue with unending problems and solutions. However, these community programs together with the hiring of youths and involvement of locals in all program activities, especially in technical activities that they are able to undertake, have shown that undertaking community development programs (no matter how small) within coastal communities will establish goodwill upon which to build interest in conservation programs. It is preferable to demonstrate benefits broadly to the community rather than

to address individual needs. The community development programs build capacity of the locals through small improvements to their daily lives that are tangible, and ultimately allow communities to better assist with sustainable conservation programs, which will either succeed with community help and participation or fail with community indifference or opposition.

Photo credits: Edward Aruna



Perceptions from Fishing Communities on Sea Turtle Status and Conservation in Central Ghana

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Coastal community members around the globe typically live in close proximity to the resources and environment they utilize for their livelihoods. As the population of these coastal communities continues to rise, the depletion of natural resources in and around those areas will continue. Many of these resources are disappearing because of their unregulated and unsustainable use for food, clothing, and infrastructure. Along the coast of Ghana, sea turtle populations have experienced a continuing decline for several decades (Armah *et al.* 1997; Amiteye 2000; Agyekumhene 2009).

Irvine (1947) first reported nesting activity for loggerhead (*Caretta caretta*), green (*Chelonia mydas*), olive ridley (*Lepidochelys olivacea*), hawksbill (*Eretmochelys imbricata*), and leatherback (*Dermochelys coriacea*) sea turtles in Ghana. Only the green, olive ridley, and leatherback still nest in appreciable numbers along the coast of Ghana (Amiteye 2000). The olive ridley and leatherback appear to nest most frequently (Allman and Armah 2008); however, nesting distribution along the coast is unlikely to be consistent (Amiteye 2000). The coastline of Ghana's central region consists of long gently sloped sandy beaches separated by short segments of rocky shoreline.

Sea turtles in Ghana are exposed to a significant number of threats during the primary nesting season from October through March (Armah *et al.* 1997; Agyekumhene 2009). Sea turtles and their eggs are routinely harvested when deposited in proximity to fishing communities. They are also often captured in commercial and artisanal fisheries as they frequent the coastal waters adjacent to nesting beaches. These animals are typically adults that may be breeding and feeding in the area. Protecting these adults is paramount for increasing population size and recovering the species (Mazaris *et al.* 2005).

The Wildlife Division of the Forestry Commission in Ghana is mandated by law to protect all wildlife resources. Ghana's law forbids sea turtle captures and injuries through the Wildlife Conservation Regulation 1971 LI-685 (Ghana Fisheries Service, 2010). Sea turtles are classified in "Series B" under this law, which prevents the captures, possession, or injury of sea turtles at all times. The implementation of this law is shared with other agencies such as the Fisheries Commission. Regulation 16(1) of the Ghana Fishery Regulation 2010 LI-1968 require all shrimp fishing vessels to use a turtle excluder device (TED) while Regulation 16(2) requires all sea turtles captured by fishing to be released.

An emerging body of information indicates indigenous management systems can be extremely powerful tools for protecting wildlife and habitat (Menzies 2006). Sea turtles have historically been protected in some regions of Ghana through a traditional history of reverence for the animals. According to this history, ancestors of these fishing communities were led safely back to land when their boat capsized while lost at sea. For this reason, the community members revere sea turtles and consider it taboo for one to harm or kill a turtle. Sea turtles are therefore

typically released when captured in a net since it is considered a bad omen to possess one. The traditional safeguard afforded to sea turtles in these communities has shown to be more effective at protecting them than the federal law (Alexander *et al.* 2012). Unfortunately, this traditional history is not well-documented or known for fishing communities west of Ghana's capital (Accra). Currently, very little is known about the knowledge and perception of sea turtles in Ghana's coastal communities that do not adhere to the traditional history. Since fishers from these communities likely have a significant amount of interaction with sea turtles, it is important to document their current view of sea turtles.

Methods: This study was conducted in communities located in proximity to Muni-Pomadze Ramsar Site (MPRS) in the Central Region of Ghana. The MPRS (05°22"N, 00°40"W) contains approximately 45 km of sandy shoreline interspersed with short rocky outcrops (Fig. 1). The primary occupation in these communities is fishing (Koranteng 1995), with intensive commercial fishing operated by migrant fishermen (Ntiamoah-Baidu and Gordon 1991). Beach and boat seining are the most common methods of fishing. Hook-line fishing is also periodically employed. Beach erosion and degradation of habitat are threatening the quality of nesting habitat. A few beach resorts exist within the study area that have unshielded lights, which may impact nesting activity and hatchling emergencies.

We used a semi-structured questionnaire to interview 120 resource users in seven communities within the core ecological zone of MPRS. Informants included fishermen, merchants, community leaders, as well as citizens at large. Respondents were randomly selected, based on availability in order to avoid bias in data collection. All respondents were assured the interview was for pedagogy and not for making arrests or forcing punishment. The interview was designed to explore their knowledge about sea turtle

abundance, ecological significance, threats, and regulations.



Figure 1. Map of the study area in the Central Region of Ghana depicting the seven communities that participated in the study.

Results and Discussion: Respondents – Of the 120 community members interviewed, 71% were males and 29% were females. Two respondents (1.7%) were under the age of 20, 45 (37.5%) were between 20-30 years of age, 32 (26.7%) between 31-40 years, 28 (23.3%) between 41-50 years, and 13 (10.8%) were over the age of 51. All of the respondents, who were fishermen, were over the age of 18. Community-level by-laws enacted by the District Assembly forbid children under the age of 18 to participate in fishing activities.

Sea Turtle Knowledge – All respondents were aware of sea turtles and have seen one at sea, on the beach, or both. Some respondents described sea turtles as 'tortoises that live in the sea'; others simply describe sea turtles as meat. The attitude of perceiving turtles as meat coupled with the low-income levels in fishing communities likely explains the cause of high turtle poaching activity observed in these coastal communities. Most families in Ghana's coastal fishing communities live on an annual income below the national average of \$210.38 USD (Ghana Statistical Service 2008). It is no

surprise that fishermen see the turtles as a commodity to be eaten or sold.

Sea Turtle Nesting – Community members recognized that three species routinely nest in

illegal. Similar observations have been made in Ada Foah (Agyekumhene *et al.* 2010) and Mankoadze, Ghana.

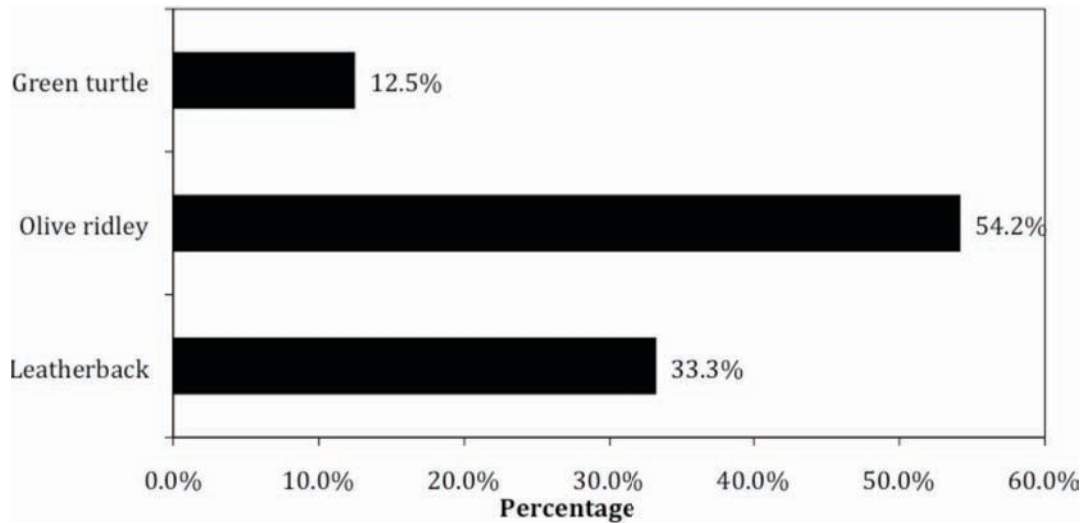


Figure 2. The percentage of each species that was considered to be the most common nesting sea turtle in the Central Region of Ghana.

the area: olive ridley, leatherback, and green sea turtles. This information mirrors data collected during nightly nesting surveys through the Ghana Sea Turtle Conservation Project (GSTCP) in Mankoadze. Additionally, the respondents correctly identified that olive ridleys are the most commonly nesting species (54.2%), followed by the leatherback (33.3%), and then the green turtle (12.5%; Fig. 2). Participants reported observing nesting sea turtles from June to January with most activity during the month of December. Past surveys along Ghana have observed nesting activity during each month of the year with most nesting between October and March with only very sporadic activity in the months of April through September (Armah *et al.*, 1997; Amiteye, 2000; Allman and Armah, 2008; Agyekumhene, 2009). Nesting surveys and poaching enforcement can, and should, be focused and intensified during the peak nesting season to help reduce poaching activities. Shanker *et al.* (2003) reported that the presence of surveillance personnel can deter poachers if they know their activities are

Sea Turtle Ecology – Most respondents (n=86, 71.7%) recognized that sea turtles serve an important ecological role in the marine environment. Other respondents (n=24, 20%) said they are unsure if sea turtles are important in the environment, while only 10 (8.3%) said they serve no ecologically important role (Fig. 3). Sea turtles were viewed as important for the following reasons: ecological, economical, medicinal, dietary, and mythical. Some respondents mentioned the traditional history of their ancestors being rescued by sea turtles. The fishermen recounted situations at sea where they would see ‘a lot of fish following’ sea turtles. Interestingly, fishermen also indicated sea turtles help keep the sea from ‘bush’ because turtles consume the vegetation found under the sea. Such feeding behavior prevents net damage and keeps the nets cleaner for more efficient fishing.

Two respondents said they have heard people testify that oil collected from sea turtle fat can be used to cure diseases. Mangar and

Chapman (1996) reported the use of sea turtle oil to treat asthma in the Mauritius Islands. Sea turtle oil is sometimes mixed with honey in eastern Ghana to treat convulsions in children (Amiteye 2000). In Kenya, the oil is believed to provide spiritual protection against evil spirits and as medicine for hernias and sore muscles (Wamukoye *et al.* 1996). Although respondents provided a variety of reasons for having a positive perception for sea turtles, the collective perception of this value has made communities more responsive to sea turtle conservation and protection measures in their communities.

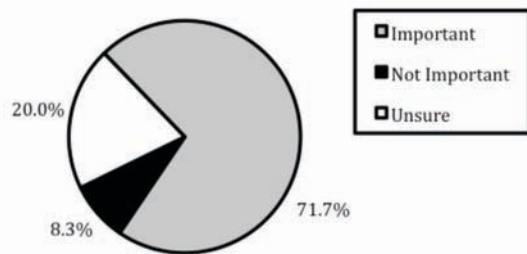


Figure 3. The frequency of respondents' opinions of the relative importance of sea turtles in the marine environment.

Ten participants (8%) had a neutral or negative view of sea turtles. They explained how sea turtles damage their fishing net, which then allows the fish to escape before the net reaches the surface. The fishermen view sea turtles as a source of debt: "after buying the expensive fishing nets on credit, the sea turtle will just destroy it...now the net, the fuel, the food we bought to eat at sea all becomes our debt and we don't get to bring any fish home to defray some of the debt all because of the turtles". These fishermen indicated turtles should not be allowed to roam the sea.

Since these concerns are associated with apparent impacts sea turtles have on their livelihood, education programs should focus on a broader understanding of the benefits sea turtles provide to the fishermen and their communities. This could further increase the

interest local fishermen may have to support sea turtle conservation programs. Since some of the benefits expressed by respondents may harm turtle populations (medical benefits of oil), education programs should focus only on those that benefit turtles. Nonetheless, the damage sea turtles cause to their nets and the resulting loss of fish are significant concerns that need to address this perceived conflict with turtles. Several groups, such as Resource and Environment Development Organization (REDO) made an effort to compensate fishermen with sections of net to help replace damaged fishing gear. This type of effort proved to be unsustainable and ineffective at addressing the issue. A fishery-based solution (gear-design) will likely be the best solution to this concern.

Sea Turtle Status – The majority of respondents (n=101, 84%) believe the number of turtles nesting in the Central Region of Ghana has decreased drastically over the past decade. The primary reasons indicated for the decline include intentional harvest of turtles and incidental drowning in fishing gear. Some respondents also thought the reduced numbers may be from natural causes. Twelve participants (10%) felt like turtles are increasingly common in the region and credited law enforcement efforts for stopping people from killing turtles and collecting eggs.

Knowledge of Existing Laws – Traditional laws are those proclamations made by the traditional authorities (chiefs, opinion leaders, etc.) and are usually based on myth or taboo. Such orders can provide an additional level of protection over the federal laws that should be enforced through the Wildlife Division and Police Department. Of the 77 respondents (64%) who are aware of laws protecting turtles, 33 (43%) knew of the traditional law and 59 (77%) knew of the national law (19% were aware of both). Those who knew of the traditional law were migrant fishermen who had moved to the communities from eastern portions of Ghana where the taboo is regularly observed. Since the migrant fishermen are

teaching the traditional stories to their children, the taboo is becoming more common throughout Ghana's coastline. A large majority (n=107, 89%) of the respondents teach the laws to their children because they do not want their children breaking laws and being arrested. The few individuals with children who do not teach them about the laws stated they expect their children to learn about the laws on their own.

The national laws are enforced regularly by the Wildlife Division through beach patrols that result in arresting poachers. The traditional laws are regulated by only a minor component of the fishing communities within the study site. Since a large majority of respondents are teaching the laws to their children, it is likely that a combination of this knowledge and continued education programs will result in a new generation of fishermen who are less likely to willfully kill turtles. Conservation programs in the area could therefore be successful if administered through the Wildlife Division since they have the sole legal authority for protecting sea turtles in Ghana.

Conclusion: Members of coastal communities in the Central Region of Ghana are very knowledgeable about sea turtles, and the existing protection measures. Such knowledge provides a strong foundation for the establishment of a long-term sea turtle conservation program administered through the local Wildlife Division office. A majority of fishermen are aware of the decline in sea turtle populations. It is encouraging that they also understand the benefits of protecting them. With this local awareness and support, the Ghana Sea Turtle Conservation Project will help the Wildlife Division establish local by-laws that provide more traditional protection for the sea turtles. Community involvement in developing these by-laws is absolutely necessary to ensure compliance and long-term support for their enforcement.

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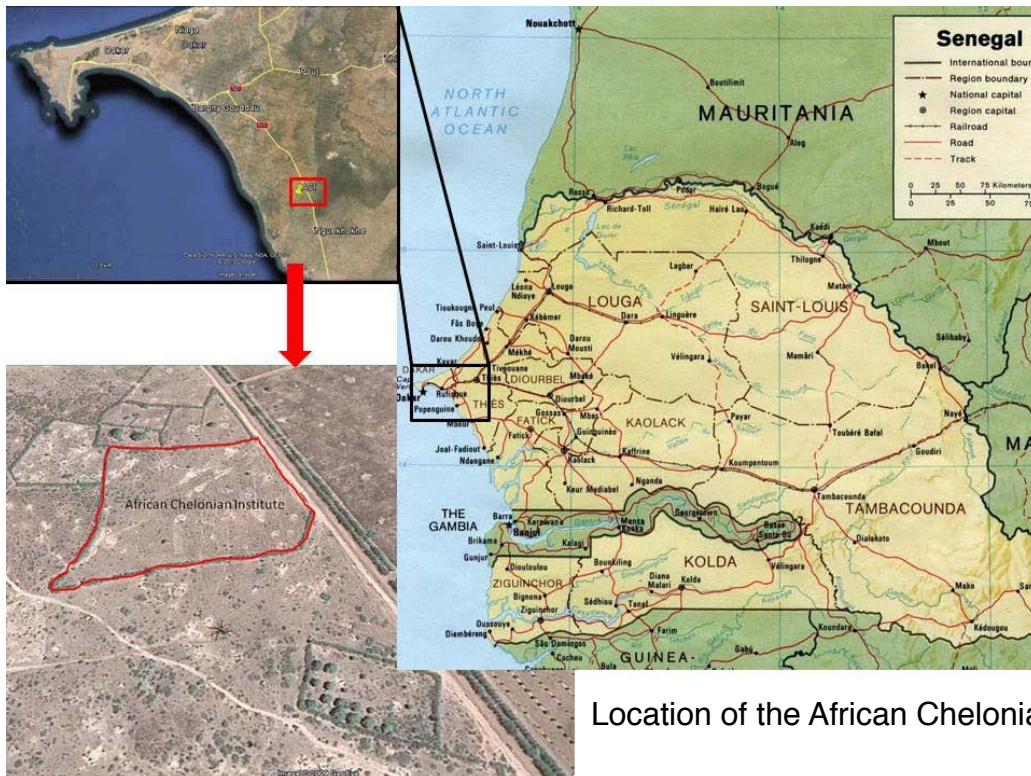
African Chelonian Institute: For the Conservation of Turtles, Tortoises and Terrapins on the African Continent

Tomas Diagne

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The African Chelonian Institute (ACI) was established in 2009 in Senegal (West Africa) in order to promote the long-term conservation of all turtle, tortoise, and terrapin populations across the African continent through research, education, and grassroots collaboration. To achieve these goals, we conduct field surveys to better understand the

distributions and conservation needs of wild turtle populations throughout Africa, and we are building in Senegal the first facility dedicated to the research, conservation, and education for all turtle species of the African continent and associated islands. Here we report on ACI's progress and achievements to date to protect Africa's critically endangered turtles.



Location of the African Chelonian Institute

The issue and threats: The status and distribution of most of Africa's 56 freshwater turtle and tortoise species is insufficiently known. The remote locations where these turtles live make them very difficult to study, and they are hunted throughout Africa as a source of food. Knowledge, management, and protection of African terrapin and tortoise species and their habitats lag far behind conservation efforts for turtles worldwide. Much focus has been directed to the Asian turtle crisis, yet many African turtle species are likely to be equally imperilled. However, there are almost no data and documentation about most species to know for certain.



Turtles are threatened by traditional medicine (Photo: Tomas Diagne)

We desperately need to increase our understanding of freshwater turtle and tortoise population status and distributions across Africa, and to build research and management capacity in as many countries as possible before we lose species forever. We believe ACI can address these needs. The African Chelonian Institute is the first center of its kind in Africa, and includes a captive breeding facility, field research of wild populations, and grassroots programs throughout Africa for conservation and re-introduction of captive-bred turtles.

Origin of the initiative: Tomas Diagne is an African freshwater turtle and tortoise expert who has been working to save threatened and endangered turtle species in Senegal for the past 20 years. He began rescuing

endangered African spurred tortoises (*Geochelone sulcata*) as a teenager, and in 1992 he created S.O.S. (Save Our Sulcatas), a non-profit organization. He co-founded and built the Village des Tortues in Rufisque, Senegal, a sanctuary and captive breeding facility for sulcata tortoises that now houses over 300 individuals and has re-introduced numerous others back to the wild. Tomas has also been actively involved in freshwater and marine turtle research throughout Africa. He is a member of the IUCN Tortoise and Freshwater Turtle Specialist Group and is the Chair of the African subgroup of the Turtle Survival Alliance. In 2009, he decided to create the African Chelonian Institute in order to expand turtle research, captive breeding, and re-introduction to all African species.



Tomas Diagne trains African colleagues (Photo: Josea Doussou Bodjrenou)

Activities and successes to date: ACI conducts field research on African turtle species in order to increase knowledge and conservation efforts. Currently this project's field effort is focused on Tocc Tocc Reserve in northern Senegal, a community-based reserve to protect habitat for the endemic Adanson's mud turtle (*Pelusios adansonii*), as well as other species. Tomas worked with the local communities at Lac de Guiers and with the Senegal government to get Tocc Tocc classified as a nature reserve, which took effect on March 22, 1996. It covers an area of 273 hectares (almost 675 acres) of diverse

habitats (lake, wetlands, and land area). A local committee for the management and conservation of the reserve is made up of volunteer members from the four villages surrounding the reserve and is led by Ndiaga Boh, the chief of Toleu village. In 2013 Tocc Tocc was declared Senegal's fifth Ramsar site, and we received funding to hire and train 22 EcoGuards, who now patrol the reserve, enforce regulations (including no fishing, hunting or livestock grazing in the reserve), and collect data on the species found there. Additionally, ACI is collaborating in a genetics study of African freshwater turtles, which is already underway with a collaborator at the University of Los Angeles in California, USA.

The Institute's vision is multi-faceted: it serve as a breeding facility for endangered and threatened African tortoises and freshwater turtles, it is building grassroots programs to reduce threats and re-introduce turtles back to their natural habitats, it will house one of the largest collections of reference specimens in Africa and a library of turtle media for study, and it will serve as a training center for students and researchers, as well as an educational center open to the public. ACI is being constructed in phases, starting with the breeding facility, which is underway since last year. The ACI consists of four main components:

1. Living collection (The Rhodin Center):

We are building a breeding and display facility for African tortoises and terrapins, with priority focus on the most endangered species. The breeding center will initiate programs to reduce threats in the turtles' natural habitats and to re-introduce captive-bred turtles in collaboration with colleagues working with the species in their native ranges, as well as to build a strong educational outreach mission. An additional important function of the ACI is to receive African turtle species confiscated by officials in the context of the implementation of CITES (Convention on International Trade in Endangered Species) regulations. This activity is conducted in close collaboration with the Secretariat of the CITES convention, and with

parties to the convention from the offices of Traffic International (Regional Office for Africa) the joint program of WWF and IUCN. ACI undertakes this activity to both save confiscated turtles from euthanasia (which is often the rule in cases of confiscation) as well as to try to repatriate the turtles back to their countries of origin, or to include them in ACI's captive breeding facility if other options are not available for them.

2. Specimen reference collection: An extensive existing collection of African chelonian skulls, shells, skeletons, preserved specimens, and eggs will be archived at ACI and available to students and scholars for taxonomic, morphometric, genetics, and other studies. Tomas Diagne has collected over 400 specimens to date for this collection at ACI.

3. A multi-media library: A library housing books, reports, theses/dissertations, movies/videos, and photographs relating to African freshwater terrapins, sea turtles, and tortoises will be available to students, turtle scholars, and the interested public as a reference collection.

4. Ethno-zoological and paleontological collection: Turtles are a powerful symbol in many African cultures, and are known in the rites of many peoples (Dogon, Baoule, Yoruba, Ewe, etc.). The Institute will house and exhibit important objects of African turtle art and turtle fossils, and it will also be a repository for documentation (folklore, stories, proverbs, traditional knowledge) of the African people's relationship with turtles. Educational graphics will explain the history and importance of the collection. Tomas Diagne began collecting African antique turtle art (primarily wooden masks, furniture, statues, carved containers, and pottery) in 2002, and now has over 40 pieces representing 16 African tribes from West and Central Africa. ACI also intends to acquire replicas of important turtle fossils from Africa and around the world for educational purposes.

This building project is now in its first phase. The ACI land has been purchased and the next steps are to fence the property, bring in the water and electrical lines, install breeding pools, and construct a small building for storage, food preparation, and an office.

The African Chelonian Institute will provide more and more benefits to the local people as well. It will be an educational resource for Senegal's schools and students, as well as for students and biologists from other African countries interested in turtles. It will also serve as a center for the public to learn the importance of conserving biodiversity, it will create jobs for several people initially, and more jobs will become available as the institute grows. Stay tuned! And follow us on our Facebook page: www.facebook.com/AfricanChelonianInstitute



ACI's turtle outreach booth at Eco-citizen Day in Dakar, Senegal (Photos Tomas Diagne)



Strengthening Ties between Communities and Biodiversity Conservation: Example of Community-Based Sea Turtle Conservation on Maio Island, Cabo Verde

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Maio is one of the three most important nesting sites in Cape Verde for the loggerhead sea turtle (*Caretta caretta*). About 500 females of this endangered species come ashore every year to lay their eggs on Maio's sandy coast. In 2012, the island had the highest rates of killed females (43%) and poached nests (18%) in the country (S. Martins and A. Marco 2013, *unpubl. data*). Human exploitation is considered the main threat, as in contrast to other islands Maio has not been yet affected by touristic or industrial developments.



A loggerhead on the island of Maio
(Photo: Mar & Ilha)

In 2013, the local NGO Maio Biodiversity Foundation (FMB) tried a new strategy for sea turtle conservation on the island. From July to September, protection teams were placed in eight coastal villages around the island to patrol 25 km of nesting beaches. Each team was composed of local guards from the villages, a team leader and national and international volunteers. Their mission

was to patrol nesting beaches during the entire night to protect and monitor sea turtles and nests, and also to collect data on all nesting events. During the day, the teams organized awareness-raising events to highlight the importance of conserving the local biodiversity and also to recruit local volunteers. Team leaders – who were young biologists/ conservationists experienced in turtle protection – together with volunteers were hosted by local female-headed families in the villages.



Data collection on the nesting beach of Barreiro (Photo: Maio Biodiversity Foundation).

The presence of team members from outside the community, the island, and also from other countries helped to increase respect for the turtle protection work and especially towards the job of the local guards. The team leaders' technical expertise, the guards' knowledge of the area and the renewed motivation from the constant arrival of volunteers were



Camouflage of nest to prevent illegal harvesting of eggs on Calhetina Beach (Photo: Maio Biodiversity Foundation).

essential for successful protection, data collection and awareness activities.

As a result, just in one season the number of nesting females killed was reduced to 11% on the protected beaches and only 2% of the nests were poached. The integration of the teams in the communities made the

conservation efforts more visible in the coastal zones and gave the villagers the opportunity to participate in turtle patrols, beach clean-ups and awareness events. In addition, host families received financial benefits for their hospitality. The combination of direct protection, practical education and turtle-friendly income opportunities for the communities were the key to successful sea turtle protection on Maio.

To continue this community-based conservation and expand the protection to the beaches that remain unmonitored are FMB's goals for the future. To reach these objectives, additional funding is urgently needed.



Team members with a host family from the town of Santo António (Photo: Maio Biodiversity Foundation).



Outreach activities and community involvement (Photo: Mar & Ilha)

A Odisseia de **TÁN**-taruga

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Abstract: This is a story from Cabo Verde about how a community and an 85 year-old lady called Tán come together to save a loggerhead. Hence, the Portuguese word for turtle, *tartaruga*, is replaced by “**TÁN**-taruga” in the title.

Ela deu à costa na Praia da Luz, em Tarrafal na ilha de São Nicolau, muito debilitada, pela infestação de parasitas (espécie de lesma) presas em toda a extensão do corpo. Apresentava leões na mandíbula, infecção nos olhos causada pelos vermes que infestavam as pálpebras, e várias feridas na pele.

Certamente ela não sabia, mas por que é benvinda por cá, foi auxiliada na saída da água por um munícipe, pois conseguiu subir até à preia-mar com auxílio das vagas, e por ali ficou.



(Photo: José J. Cabral)

Esse mesmo cidadão **Sr. Amadeu d'Olívia**, que diga-se de passagem tem sido um colaborador na preservação das tartarugas, alertou-me e, para lá segui em socorro do animal.

Um outro munícipe disponibilizou transporte, outro, o reservatório de água de sua quinta, onde ela se encontra a convalescer, depois de ter sido limpa dos parasitas, por voluntários, medicada com desparasitante e



(Photo: José J. Cabral)

vitaminas, com que se espera ela se venha a recompor e ganhar forças para o regresso ao mar.

A agência local do Banco Comercial do Atlântico, prontamente se disponibilizou para suportar as despesas de tratamento do animal, um apoio simbólico, mas muito apreciado, exemplo do que deve ser a responsabilidade social e ambiental das empresas privadas, porque a preservação ambiental é responsabilidade de todos.

Com peso de apenas 55 kg e 79 e 78 cm de carapaça, encontra-se aparentemente bem. Muito stressada, alimenta-se com alguma dificuldade. Prevê-se a sua devolução ao mar no domingo.

Foi atribuído à tartaruga o nome de “**ANTÓ JÓNA**”. Com efeito, **Antónia Joana da Cruz**, localmente tratada carinhosamente por **TÁN**, é uma peixeira, a mais velha do Tarrafal em actividade. Preste a completar 85 anos de

idade (18 de Maio) carrega seu balaio de peixe, para comercializar onde puder.

Ainda no activo, lamenta Tán, os filhos não querem que ela venda peixe. Infelizmente, desabafa, não há ainda um sistema de Protecção Social para essa camada. Uma vida inteira a trabalhar... não teve sorte nem com marido nem com filhos. Apenas 4 dos 10 estão vivos. Desses não tem de que reclamar. Mas estão longe... Encaro como forma de distracção, ver pessoas, conversar, conhecer novas pessoas, espairer, e porque não ajudar nas despesas da casa. Afinal foi pai e mãe de seus filhos.



(Photo: José J. Cabral)

Tán, pariu 10 filhos, dos quais apenas 4 estão vivos; Criou sozinhos os filhos que teve com o pescador conhecido por Món Regina, falecido há já alguns anos, não perde um único baile de rabeca. Mais que isso, não perde uma única peça. Contraria um costume local. Sem tempo para parar na sala de baile Tán não espera sentada para ser “tirada para dança”. Se não lhe tiram, toma ela a iniciativa de tirar “chevalier” como por cá se denomina o parceiro de dança.

“Rija e Balenta”, a octogenária aceitou ser madrinha desta fêmea, que esperamos voltar a encontrar nas praias de Tarrafal, de São Nicolau, de Cabo Verde. Ela será marcada com anilhas inoxidáveis, para que mais tarde, quando ela regressar para desovar, seja



(Photo: José J. Cabral)

reconhecia, balénta e decidida como a brava peixeira que lhe emprestou o nome.

Depois de marcada com anilha inoxidável, a tartaruga foi devolvida ao mar, em acto que contou com a presença da população, presidido pelo pároco local, Frei José Pires, que na altura apelou à preservação do meio ambiente, particularmente das tartarugas, nossos irmãos, criaturas a quem como nós é reservado o direito de viver.



(Photo: José J. Cabral)

Atordoada, teve a companhia de várias crianças do Tarrafal, que a viram desaparecer no oceano imenso e parir, para quem sabe um dia regressar para reproduzir, e aumentar a população da espécie, em vias de extinção.

Formulamos votos que São Francisco de Assis, o padroeiro de Tarrafal, ele que é o protector dos animais, vele não só por esta, como por todas as tartarugas do Mundo, para que nossos filhos e netos, não venham a apenas ouvir falar da existência um bicho chamado tartaruga, mas que os humanos comeram até acabar.

Esperamos que ela regresse para desovar e, possamos então comemorar.



(Photo: José J. Cabral)



(Photo: José J. Cabral)



NHA TERRA: A Campaign to Reduce the Consumption of Turtle Meat in Cabo Verde

Jacquie Cozens & Berta Renom

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Cabo Verde supports one of the largest loggerhead nesting populations in the world. However, extensive exploitation of turtles for their meat and eggs poses a serious threat to this population. The *Nha Terra* campaign was born from the concern that a large amount of turtle meat was being trafficked between islands completely unhindered.



Photo: SOS Tartarugas

Primarily an outreach and sensitisation campaign, *Nha Terra* complements the direct protection activities being undertaken by the government and NGOs all over the country. It aims to reach decision makers in local

government and authorities, such as the police, by offering workshops in eight different locations on Santiago, home to the capital city of Praia.



Photo: SOS Tartarugas

Consumption of turtle meat is very high on this island, which has relatively few nesting turtles; therefore the majority of meat being eaten is almost certainly being transported from other islands such as Boa Vista, Maio and Sal.

The campaign began in 2011 and focused on the concept of the turtles being migrants, travelling the world but always returning home to *Nha Terra* (Our Land) – a concept that evokes a strong emotion amongst the human population who have a history of migration and whose music and literature speak of ‘sodade’ – a longing for ones homeland. The theme communicates that turtles as well as people should view Cabo Verde as a safe place to finally come home to after a long time away.



Photo: SOS Tartarugas

Over the last three years, the campaign organisers, ADTMA SOS Tartarugas and their national and local government partners have hosted over 100 decision makers at workshops and held 20 public events including concerts featuring traditional music forms such as Batuku.



Photo: SOS Tartarugas

A special song, celebrating turtles in Cabo Verde, was written just for this purpose and was aired on national radio. In addition, the campaign includes a pledge aimed at restaurant owners who are encouraged to commit to never buying or serving turtle meat. In return for this commitment they receive a certificate and a campaign sticker. Generally the owners were extremely happy to participate, signaling a gradual change in attitude.



Photo: SOS Tartarugas

The campaign will run again in 2014 thanks to the support of the International Sustainable Seafood Foundation and NOAA, but for the first time, it will be rolled out to four other islands (Sal, Maio, Boa Vista and São Nicolau). The collaboration of local NGOs and government authorities on each of the islands is crucial to its success. The aim of the workshops is to increase the knowledge amongst the authorities of the laws governing turtle protection. This will be further enhanced by special workshops for those working at the ports and airports, to emphasise the need to check the contents of cool boxes that may contain turtle meat, not fish.

Restaurant owners and shopkeepers on each of the islands will receive a personal visit in order to provide them with basic information about loggerhead biology, the importance of Cabo Verde for nesting turtles and specific threats for loggerheads in Cabo Verde. This

also gives the opportunity to conduct research into the process of the sale and purchase of turtle meat on each of the islands. In order to reach the general public, there will also be a media campaign using both national newspapers and national and regional radios.

Involving local NGOs will expand and enhance the programme and highlight the need to prevent trafficking of turtle meat both at the source and the entry point.

For more information please contact SOS Tartarugas: info@sostartarugas.org



Photo: SOS Tartarugas



A Summary of Sea Turtle Status and Conservation Efforts in Somalia

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Somali Integrated Fishing Organization (SIFO) is a non-government, non-profit and non-political organization. Founded in the year 2000, SIFO is mandated to carry out activities reflecting its mission and vision for social development in coastal Somalia. The organization works to improve the quality of coastal livelihoods and promote capacity for sustainable marine resource utilization and management.

The south coast around the Kismaayo/Bajuni Archipelago is the most well known area for nesting green turtles with 15 sites being identified by local fishers. None of the areas is protected and nests are frequently poached, although there are no quantitative data available on the incidences of poaching. Historically, sea turtles were harvested for their fat, which was turned into oil and exported to Kenya and Yemen. Today, poaching is carried out by fishers who use driftnets to capture turtles for consumption, and the meat is sold at local fish markets (Fig. 1). Large piles of green turtle bones are present along many of Somalia's beaches, indicating that capture rates are high. Interviews conducted by SIFO with local fishermen show that communities around Kismaayo are totally dependent on fish products for food and protein so there is high demand for turtle meat. Turtle eggs are also consumed as medication for various illnesses.

There is also a paucity of data available on the location of sea turtle foraging grounds in Somalia although satellite telemetry data from Tanzania have identified two foraging grounds utilized by female green turtles that nested in Tanzania, one close to Bur Gool in central Somalia and another 100 km south of Mogadishu near to Munggiya.

SIFO provides information to communities on marine resource conservation and delivers education and outreach programmes that incorporate sea turtle conservation and

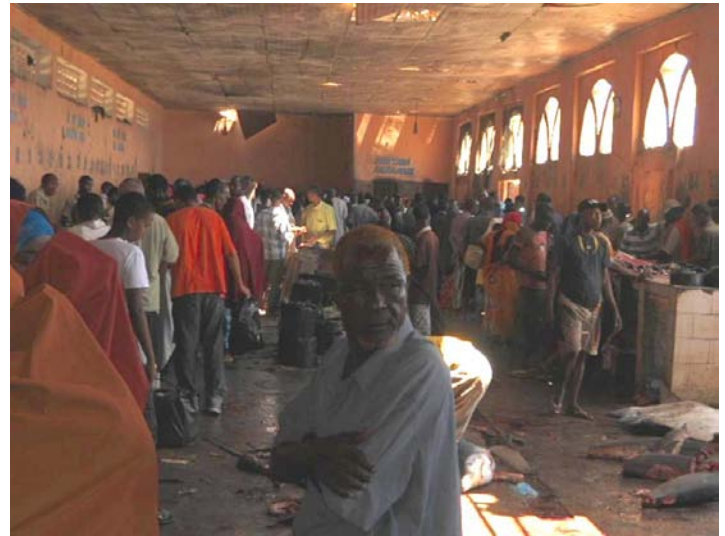


Figure 1. A crowded fish market showing evidence of trade in turtle products.

protection. Recently, SIFO organized a workshop to sensitize community leaders and fishers in Kismaayo and the small islands of the south coast on the importance of protecting marine migratory species. However, government policies and regulations related to these species are yet to be verified in Somalia so the impact of the workshop was compromised as SIFO was unable to provide clear and definitive information to participants.

SIFO recognizes that the absence of current data on sea turtle distribution and abundance hampers conservation and management efforts in Somalia. Addressing data gaps is a priority activity along with further awareness raising activities to improve understanding of sea turtle biology and conservation,

particularly amongst communities living in the south coast regions of Somalia, around Julla and Javaya. SIFO has conducted initial sea turtle awareness activities in these communities through public gatherings and dissemination of information using loud speakers, which provided essential

information about the fragility of sea turtle populations in these areas, but there is still much work to be done.



Celebrating 20 Years of Marine Turtle Tagging and Monitoring in Southern Mozambique

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The Ponta do Ouro Partial Marine Reserve (POPMR), located in southern Mozambique, is part of the Lebombo Transfrontier Conservation Area (Fig.1) and is an important nesting area, from October to March, for loggerhead (*Caretta caretta*) and leatherback (*Dermochelys coriacea*) turtles (Louro *et al.* 2006; Costa *et al.* 2007; Videira *et al.* 2008).

A monitoring and tagging program using titanium flipper tags was initiated in 1994. Initially restricted to a 30-km stretch of beach (from Ponta Malongane to Ponta Dobela), the programme was spearheaded by Mr. Pierre Lombard and his family (Fig. 2) with support from Dr. George Hughes, who then supervised the South African turtle monitoring programme.



Figure 1. Schematic map of the Ponta do Ouro Partial Marine Reserve (POPMR). Map courtesy of the Peace Parks Foundation.



Figure 2. Pierre and Yvone Lombard handling a loggerhead turtle, Ponta do Ouro Partial Marine Reserve (Photo: Marcos A. M. Pereira).

The monitoring programme consists of night patrols during the low tide using a 4x4 vehicle, where turtles are identified, checked for tags and the nesting activity recorded (nest/false crawl). Throughout the earlier years the monitoring effort per season varied and typically covered two months (December and January), with longer periods in recent years. Since 2007, the whole coast from Ponta do Ouro to Ponta Abril has been monitored for the entire duration of the nesting season (October-March) using on-foot patrols at the beginning and end of the season, to complement the 4x4 patrols conducted during the peak of the season.

The area between Ponta Malongane and Ponta Dobela is the most important nesting section within POMPR. For loggerheads, during the last five seasons, approximately 50% of the total nests from POMPR were laid in this section (Videira *et al.* 2010; 2011; Louro *et al.* 2012; Louro and Fernandes 2013; Fernandes *et al.* 2014). Figure 3 shows the number of tracks (i.e. crawls which might have resulted in a nest or not) recorded per species since 1994 on this section (total of 5,811 tracks from loggerheads and 410 from leatherbacks). An increase in the number of tracks recorded for both species in the last seven years is likely the result of increased human effort to cover the monitoring season, both temporally and spatially. From 2007 to 2014, loggerheads have laid an average of 296 nests (SD = 118) per season, while for leatherbacks, 28 nests (SD = 11) were recorded on average per season.

A total of 1,457 turtles were tagged, with the great majority being loggerheads (89.6%). As shown in Figure 4, the number of loggerhead turtles tagged per season has been steadily increasing, with a record 197 turtles tagged in 2013/14, and an average of 68.7 (SD = 49.1) turtles tagged per season. The number of

leatherbacks tagged per season has seen little variability throughout the years with an average of 8.0 (SD = 3.2) turtles tagged per year. These trends were previously reported by South African colleagues (Nel *et al.* 2013), working on a much larger data set of the same population.

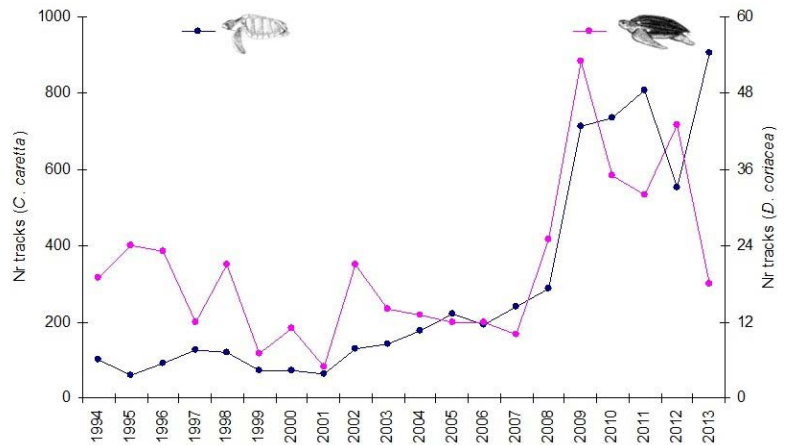


Figure 3. Number (Nr) of tracks recorded for loggerhead and leatherback turtles between Ponta Malongane and Ponta Dobela.

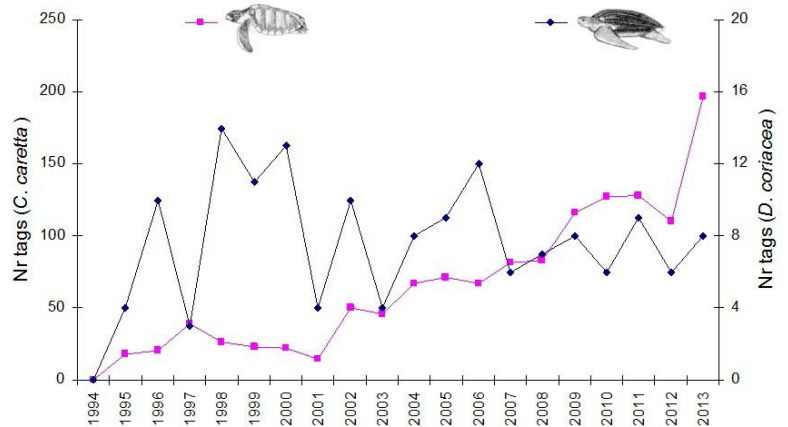


Figure 4. Number (Nr) of loggerhead and leatherback turtles tagged between Ponta Malongane and Ponta Dobela.

Apart from tagging and monitoring, recent research activities in the area include a study on loggerhead population connectivity and structure using mitochondrial DNA and microsatellites markers (Fernandes, *in prep.*), satellite telemetry (Pereira *et al.* 2014), and monitoring of nest temperatures and assessment of sex ratios of loggerhead and leatherback hatchlings (Pereira *et al.* 2013).

Twenty years later, the Ponta do Ouro Partial Marine Reserve has a consistent and functional marine turtle monitoring programme with well-trained and committed monitors, drawn from local communities. The area is considered a nesting hotspot for both loggerhead and leatherback turtles in Mozambique; in the last five seasons, more than 80% (loggerhead) and 90% (leatherback) of nests recorded in Mozambique were located in the POPMR (Videira *et al.* 2010, 2011; Louro *et al.* 2012; Louro and Fernandes, 2013; Fernandes *et al.* 2014). The presence of this well established programme is clearly contributing to the conservation of loggerhead and leatherback turtles, as the number of mortalities caused by humans are null or very rare. Further studies should be conducted and include analysis of nesting success and tag-recapture data. Finally, there is a pressing need for improved integration and information sharing at a regional level.

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The First Documented Case of Foraging Ground Philopatry in a Female Green Turtle (*Chelonia mydas*) in Tanzania

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Periodic migrations of hundreds to thousands of kilometres between breeding and foraging areas are a prominent feature of the life history of green turtles (*Chelonia mydas*) (Seminoff *et al.* 2008). Female green turtles show high levels of nest site fidelity (Meylan *et al.* 1990) and several studies have shown that female green turtles also demonstrate fidelity to migratory routes and foraging areas after successive breeding years (Limpus *et al.* 1992; Broderick *et al.* 2007; Marcovaldi *et al.* 2010).

Understanding of marine turtle distribution, movements and habitat preferences at temporal and spatial scales is essential to guide the development of effective conservation and management measures. High levels of fidelity to nesting sites, migratory corridors and foraging grounds demonstrate that protection of these areas can serve as an important tool for the future conservation of marine turtles (Broderick *et al.* 2007). Knowledge of migration patterns also facilitates regional cooperation across the turtles' migratory range (Kennet *et al.* 2004).

Within the southwest Indian Ocean region, Bourjea *et al.* (2013) demonstrated strong ecological connectivity between nesting sites, migratory corridors and foraging grounds at a regional scale. In support of these findings, a satellite telemetry project was undertaken for the first time in Tanzania in 2012 to determine post-nesting migratory routes of green turtles with natal origins in Tanzania and to identify the location of their foraging grounds. Satellite tags were deployed on four females nesting in Juani Island, which is the largest green turtle rookery in Tanzania and is situated in the

south east of Mafia Island Marine Park (Fig. 1).

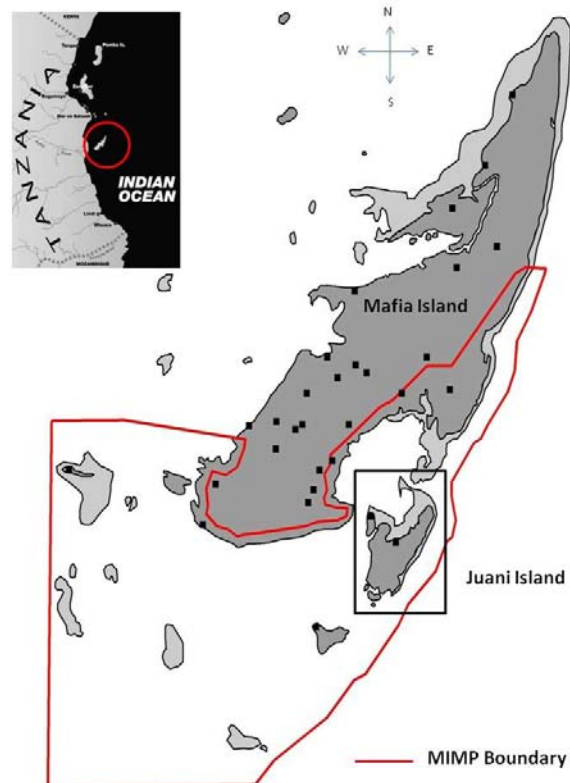


Figure 1. Juani Island within Mafia Island Marine Park.

Methods: Four females that had each laid a minimum of three clutches were identified as suitable for satellite tracking. Satellite transmitters (SPOT 5 Wildlife Computers) were placed in position on the second central scute and attached using a two-part epoxy resin (Pure 2K). The epoxy resin was applied to all sides of the transmitter, shaped into a hydrodynamic mould and left to set for 5-6 hours after which the turtle was released at the same point of capture. Transmitters were applied after oviposition was completed, to minimise disturbance.

In 2014, after an interval of two years, one of the turtles (named Sunday) was recaptured on the same nesting beach in Juani Island, and tagged for a second time using the same tag type and attachment procedures. On both occasions, the transmitters were programmed with a 24 hr duty cycle.

Satellite location data were managed via the Argos system, which assigns classes of accuracy to each location. Data were filtered using Satellite Tracking and Analysis Tool (STAT; Coyne and Godley 2005). Classes 3, 2, 1, 0, A and B were used to construct routes. Location class X was excluded from the analysis as were successive locations with turning angles of $<25^\circ$ and travel speeds of >8 km/h.

Results: In 2012 and 2014, the tags transmitted for a sufficient period (69 and 50 days respectively) to allow the turtle to be tracked to her foraging ground.

Sunday followed a very similar migratory pathway during successive migrations between her nesting beach and foraging ground (Fig. 2). Following tag deployment in 2012, Sunday stayed within 26km of her nesting beach for 40 days during which time she laid three more nests. Upon starting her post nesting migration she travelled north along the eastern coastline of Mafia Island. At the northern point of Mafia Island, she turned west and swam towards the mainland coast for approximately 37 km before turning northwards. She reached her foraging ground five days after leaving her nesting beach.

Following tag deployment in 2014, Sunday stayed within 22 km of her nesting beach and went on to lay two more nests. 22 days after tag deployment, Sunday started her migration, following the same route up the eastern coastline of Mafia Island, turning west at the northern tip of Mafia Island, and then travelling north to her foraging ground. As in 2012, she reached her foraging ground five days after leaving her nesting beach.

On both occasions she travelled to the same foraging ground near to Buyuni in Temeke District, 60 km south of Dar es Salaam and approximately 100 km (straight line distance) from her nesting beach.

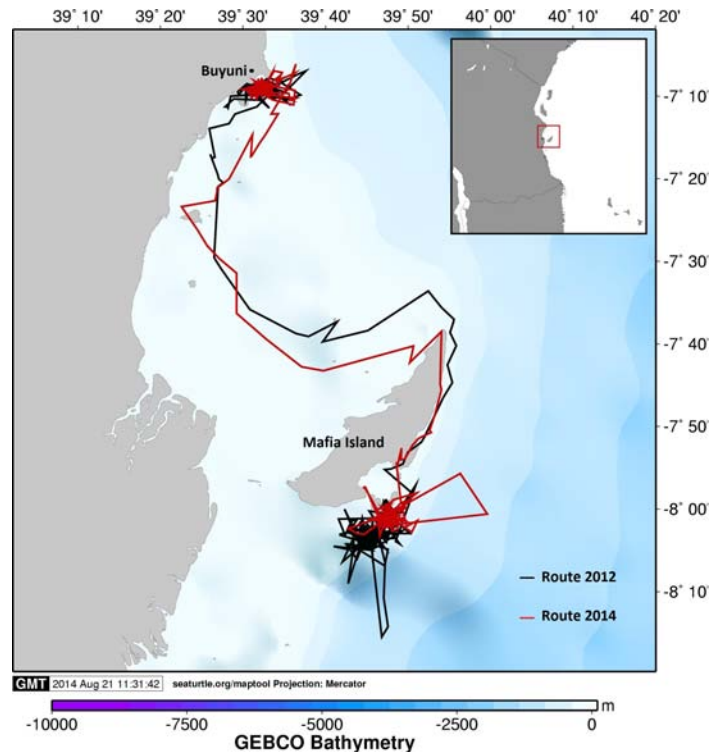


Figure 2. Routes taken by a female green turtle (Sunday) to her foraging site after two consecutive breeding seasons.

Discussion: The recapture of Sunday in 2014 provided an unexpected opportunity to deploy a satellite transmitter for the second time and investigate the level of fidelity to her previous migratory route and foraging ground. She was tracked for two consecutive migrations and used a very similar route to return to the same foraging ground on both occasions. Although data presented in this study include the movements of a single individual, the results confirm findings from previous studies in which green turtles demonstrated strong philopatry to specific foraging grounds.

Prior to this study, the area around Buyuni was unknown to be a green turtle foraging ground. Anecdotal information from local fishers suggests that the area is a productive

fishing ground and is subject to high fishing pressure. There are several migrant fisher camps close to Buyuni and the use of gill nets is common in Temeke District (Marine Fisheries Frame Survey 2009). Knowledge of migratory pathways and foraging area destinations is therefore essential to identify high risk areas for green turtles and inform the development of effective conservation measures that protect critical habitat and mitigate anthropogenic impacts such as fisheries bycatch and targeted capture.

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Atelier de formation des pêcheurs sur l'environnement marin et les tortues marines au port de pêche de Larache, Maroc

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Abstract: In June 2014, ATOMM (Association for the Protection of Sea Turtles in Morocco) organized a training workshop for more than 60 fishermen and students at Larache port. This workshop was part of a collaborative study between ATOMM and Larache port fishermen to evaluate the impact of fisheries on sea turtles found in Moroccan waters. Through this workshop we tried to educate the fishermen about turtles and data collection techniques and also further strengthen our collaboration with them to collect data on accidentally captured sea turtles. Nine other workshops have been organized along the Moroccan coast in Al Hoceima, Oued Laou, M'diq, Tangier, Casablanca, Agadir and Laâyoune.

Dans le cadre de ses activités depuis 2008 et à l'occasion de la journée mondiale des océans (8 juin 2014), ATOMM (Association de protection des tortues marines) en collaboration avec différents partenaires (Faculté des sciences de Tétouan, Institut des Technologies de Pêche Maritime (ITPM) et le Centre National de Vulgarisation Maritime-Larache) a organisé un atelier de formation pour une soixantaine de personnes (marins pêcheurs et étudiants) à ITPM à Larache, Maroc. Etaient présents dans cet atelier aussi Mons. Mustapha Riadi, Directeur de ITPM et Mons. Thami Mehti, Directeur du Centre National de Vulgarisation Maritime-Larache.

L'ouverture de l'atelier a été faite par Mons. Mustapha Riadi qui a souhaité la bienvenue aux participants et a encouragé ce genre d'activité environnementale qui coïncide avec la journée mondiale de l'environnement (5 juin) et la journée mondiale des océans (8 juin). En fait, l'ITPM de Larache abrite le Centre National de Vulgarisation Maritime; ce dernier chapeaute au niveau national les activités de vulgarisation de la science marine et la sensibilisation des pêcheurs pour une gestion durable des ressources.



Vue de l'audience de l'atelier de Larache
(Photo: Zakaria Bouhmid ©)



Figure 2. Ouverture de l'atelier de Larache
(Photo: Zakaria Bouhmid ©)

Mons. Mustapha Aksissou (enseignant chercheur à la Faculté des sciences de Tétouan et Président de ATOMM) a parlé de l'importance de l'ouverture de l'université Abdelmalek Essaâdi et la société civile (ONG) sur le milieu socio-économique et du bénéfice mutuel des étudiants et des pêcheurs de ce genre de rencontre. Le Maroc a besoin d'une base de données et de la recherche sur son milieu marin et les espèces menacées notamment les tortues marines.



Vue des pêcheurs présents lors de l'atelier de Larache (Photo: Zakaria Bouhmid ©)

Mons. Thami Mechti, Directeur du Centre National de Vulgarisation Maritime-Larache a aussi souhaité la bienvenue aux participants et a donné un aperçu sur le Plan Halieutis-Maroc dans lequel il a montré l'importance du Maroc dans la pêche mondiale, les problèmes qu'affrontent la durabilité de pêche et les solutions à prendre pour une meilleure gestion des ressources halieutiques. Dans cet exposé, il a détaillé (en dialecte arabe) les causes de la dégradation du milieu marin et les moyens de le sauvegarder par la diminution de l'effort de pêche, repos biologique, respect des tailles minimales des poissons à pêcher, interdiction du filet maillant dérivant, lutte contre la pêche non réglementaire, lutte contre la pollution, création des aires marines protégées et sensibilisation du pêcheur et public. Mme. Wafae Benhardouze a ensuite donné un exposé détaillé (en dialecte arabe) sur les tortues marines (espèces de tortues marines



Présentation de Mme. Wafae Benhardouze lors de l'atelier de Larache (Photo: Zakaria Bouhmid ©)

existantes au Maroc, répartition géographique, chaîne alimentaire, cycle biologique, menaces, échouages, conservation, coopération) et aussi sur la méthodologie de prise des mesures pour avoir des données sur l'interaction entre les pêcheries et les tortues marines. Elle a insisté sur comment reconnaître les espèces de tortues marines, remplissage de fiches, comment lire et mettre les bagues, comment traiter une tortue blessée, comment faire les mensurations par les pêcheurs.



Discussion avec les pêcheurs lors de l'atelier de Larache (Photo: Zakaria Bouhmid ©)

Nous avons distribué aux pêcheurs des fiches en Arabe et en Français qui vont aider à reconnaître les espèces pêchées accidentellement. Nous leur avons aussi demandé de nous fournir des données sur les tortues capturées

accidentellement dans leurs filets ou hameçons par le remplissage d'un tableau. Des instruments (fiches, rubans centimètres, carnets, crayons) ont été distribués aux pêcheurs les plus intéressés. Ces derniers nous ont donné leurs noms et leurs numéros téléphoniques et nous ont promis l'aide pour avoir des données sur les tortues marines capturées accidentellement.



Deux maquettes des tortues marines pour démonstration (Photo: Zakaria Bouhmid ©)

Une discussion a été entamée avec les pêcheurs et ils ont déclaré qu'ils sont en majorité des senneurs et quelques chalutiers. La tortue caouanne (*Caretta caretta*) est la plus représentée dans la région de Larache suivie de la tortue luth (*Dermochelys coriacea*). D'après les pêcheurs, la caouanne entre en interaction avec les pêcheries

essentiellement dès le mois d'avril jusqu'à septembre dans les filets de la seine, et les individus sub-adultes autour de 40-60 cm de CCL sont les plus capturés accidentellement dans la région de Larache.

Certaines interventions des pêcheurs ont insisté sur la réflexion comment encourager les pêcheurs à coopérer dans ce projet, sur le problème de pollution des fonds marins par les plastiques. ATOMM veut qu'il y soit une conciliation entre les intérêts des pêcheurs, la conservation des ressources halieutiques et les tortues marines et l'application des conventions internationales sur la conservation des espèces menacées. ATOMM vise à travers cet atelier pouvoir collecter des données sur les tortues présentes dans la région de Larache ainsi que sensibiliser les pêcheurs pour la conservation des tortues marines au Maroc. Nous espérons à travers les résultats attendus de cet atelier pouvoir contribuer à la connaissance des tortues marines dans la région de Larache et mieux les protéger en apprenant aux pêcheurs l'importance et les méthodes de sauvetage des tortues marines.



Vue de certains participants à l'atelier de Larache (Photo: Zakaria Bouhmid ©)

Sea Turtle Champion: Ibrahim Boima



The Sea Turtle Conservation effort in Sierra Leone discovered Ibrahim Boima in 2009 when the project acquired its first vehicle. He was initially called upon to teach me to drive, but his passion, desire, honesty and respect for authorities earned him a job as the project driver in 2010. During his five years with the sea turtle conservation program, Ibrahim was more than a driver.

In the field he was part of the data collection, education and sensitization team as well as the cameraman; and he had no mercy for defaulters and no one dared mess with him on issues related to sea turtle conservation.

In the project boat, he was an apprentice and a backup boatman. In the vehicle, of course he was the boss! On the road, he was the mechanic. He cared so much for the vehicle that it always appeared new and clean to the eyes of beholders. In town, mechanics were always amazed at his care for the project's vehicle because unusual noise from any part would send him running to the garage for a check-up.

In the office, Ibrahim was my personal assistant; he was always there to ensure that everything was progressing smoothly—he was like the office assistant and storekeeper, always checking and ensuring that all the program equipment is intact and cautioning fellow staff members about their use and the need for keeping them clean.

His desire for helping visitors was infectious. This again made him into a receptionist. I mean, this guy was just everything to the sea turtle conservation project, including a founder member of the Reptile and Amphibian Program of Sierra Leone (RAP-SL). His loss, on 17 August 2014, is not only to RAP-SL, but to the sea turtle family as a whole. May His Soul Rest in Perfect Peace.

Edward Aruna

Reptile and Amphibian Program, Freetown, Sierra Leone

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The African Sea Turtle Newsletter (ASTN) is a free, bi-annual international electronic publication about the biology and conservation of sea turtles in Africa, and the stories of people who work with sea turtles on this vast and diverse continent and its offshore islands. This publication hopes to increase communication and collaborations among all those working with sea turtles in Africa –scientists, conservationists, policy-makers, project managers, community members, students, professors, everyone!—as well as share news with the international sea turtle community.

Contributions can range from original scientific papers and natural history observations to opinions, anecdotes, local myths, taboos, pharmacopeia, and legends, as well as field experiences, workshops, education and awareness activities, and announcements. We will accept and publish contributions in English, French, Spanish, and Portuguese so that everyone can express themselves in the language they most feel comfortable.

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All submissions will be reviewed for content and formatting. A contact address should be given for all authors together with an email address for correspondence during the review process.

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To ensure a fast review, we ask that all submissions be in electronic form as a MS Word file (or text file) attached to an email. If email is not available, authors should contact the Editors to seek alternative arrangements. If internet or computer facilities are not available, a hard copy of the article can be sent to the Editors by mail or fax.

Scientific names should be italicized (e.g. *Dermochelys coriacea*) and given their full Latin name only in the first appearance.

Citations within the text should be listed in chronological and then alphabetical order (Fretey 2001; Formia *et al.* 2003; Tiwari and Dutton 2006). Please note the format of each type of reference (single, multiple, or two authors) within the text.

The literature cited should include only references cited in the text. Please use the following formats:

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INSTRUCTIONS POUR LES AUTEURS

Le bulletin d'information, African Sea Turtle Newsletter (ASTN) est une publication électronique internationale gratuite et biannuelle qui traite de la biologie et de la conservation des tortues marines en Afrique, de même que des expériences de personnes qui travaillent sur elles dans ce continent si vaste et diversifié, avec ses îles côtières. Cette publication vise à encourager la communication et la collaboration entre tous ceux qui travaillent sur les tortues marines en Afrique—les scientifiques, les écologistes, les politiciens, les directeurs de projets, les membres de communautés diverses, les étudiants, les professeurs, tous! Aussi vise-t-elle à disséminer les nouveautés entre les membres de la communauté internationale qui travaille sur ces espèces.

Nous acceptons des contributions diverses y compris des articles scientifiques, des observations dans la nature, des opinions, des anecdotes, des mythes locaux, des informations d'utilisation dans les pharmacopées, des légendes, des expériences personnelles de terrain, des ateliers, des activités pédagogiques et des annonces d'événements. Nous accepterons et publierons des contributions en anglais, français, espagnol et portugais pour que tous puissent s'exprimer dans la langue dans laquelle ils sont plus à l'aise.

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Fretey, J. 2001. Biogeography and conservation of marine turtles of the Atlantic Coast of Africa. CMS Technical Series No. 6. UNEP/CMS Secretariat, Bonn, Germany. 429 pp.

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Brongersma, L.D. 1982. Marine turtles of the Eastern Atlantic ocean. Pp. 407-416. *In*: K.A. Bjorndal (Ed.) *Biology and Conservation of Sea Turtles*. Smithsonian Institution Press, Washington DC. 583 pp.

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O Boletim African Sea Turtle Newsletter (ASTN) é uma publicação electrónica internacional bianual, gratuita, sobre a biologia e conservação das tartarugas marinhas em África e das histórias de pessoas que com elas trabalham neste vasto e diversificado continente e suas ilhas. Esta publicação pretende aumentar a comunicação e colaboração entre todos aqueles que trabalham com tartarugas marinhas em África - cientistas, conservacionistas, políticos, gestores de projectos, membros das comunidades, alunos, professores, todos! – assim como compartilhar notícias com a comunidade internacional do ramo.

As contribuições podem variar desde artigos científicos originais e observações sobre história natural a opiniões, histórias, mitos locais, tabus, farmacopeia e lendas, bem como experiências de campo, oficinas, atividades de educação e sensibilização e anúncios. Iremos aceitar e publicar contribuições em Inglês, Francês, Espanhol e Português para que todos se possam expressar na língua em que mais se sentem confortáveis.

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Um livro:

Fretey, J. 2001. Biogeography and conservation of marine turtles of the Atlantic Coast of Africa. CMS Technical Series No. 6. UNEP/CMS Secretariat, Bonn, Germany. 429 pp.

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El boletín, African Sea Turtle Newsletter (ASTN) es una publicación electrónica internacional gratis y bianual que apunta a divulgar novedades sobre biología y conservación de tortugas marinas en África, en base a experiencias de los investigadores que trabajan con estos reptiles en dicho continente, sus islas y su litoral tan vasto y diverso.

Esta publicación aspira a fomentar la comunicación y la colaboración entre todos que trabajan con las tortugas marinas en África (científicos, conservacionistas, personas políticas, gerentes de proyectos, miembros de comunidades locales, estudiantes, profesores, todos!) Además de compartir las novedades que surjan entre los miembros de la comunidad internacional que trabajan con estas especies.

Se aceptan contribuciones al boletín desde artículos científicos hasta observaciones sobre el mundo natural, opiniones, anécdotas, mitos locales, farmacopea, leyendas, experiencias personales en el “campo”, talleres, actividades pedagógicas y anuncios de varios eventos. Se publicarán contribuciones en inglés, francés, español y portugués para que todos puedan expresarse en la lengua más conveniente.

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Capítulo o artículo en un volumen redactado:

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