

SEA TURTLES IN URUGUAY: Where Will They Lead Us...?

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ABSTRACT Karumbé, which started in 1999 as a group of students focused on research and the conservation of sea turtles in Uruguay, has become a melting pot of biologists, veterinarians, teachers, students, researchers, and fishermen all devoted to the cause of sea turtles. We have selected some personal experiences, written by members of Karumbé, who work in the field, interacting directly with the coastal people. The reader will learn that sea turtles have turned out to be flagship species, leading Karumbé far beyond sea turtle research and conservation. The close cooperation between the academic researchers and the people of the sea has not only allowed Karumbé to achieve goals that would not have been possible otherwise, but also, and most importantly, established very clearly that collaboration between the scientific community and local people in any investigation or conservation programme is fundamental if there is to be success.

Introduction

Uruguay, located between thirty and thirty-five degrees south on the southeastern coast of South America (Figure 1), has no nesting beaches for sea turtles, and as a result relatively little attention has been paid to these animals. Before 1999, the knowledge about sea turtles in Uruguayan waters was restricted to anecdotal observations at sea, a few stranding reports, a study of the contents of one stomach, some species identification sheets in a national guide to reptiles and amphibians and one report of interactions with the longline fishery. In 1999, a group of young college students specialising in biological sciences and primary education, independent researchers, and biologists interested in developing research and conservation activities on sea turtles in Uruguay formed Karumbé, an independent group with no academic or governmental affiliation.

Karumbé means 'turtle' in the language of the Guaraní Indians, the original inhabitants of Uruguay's coastal zone. Karumbé's first activities were surveys of the 630 kilometre coast, looking for stranded sea turtles; interviews with local fishermen and other members of coastal fishing communities; reviews of specimens in museum collections, as well as private homes and restaurants (where carapaces are often used as ornaments); and the establishment of a turtle camp in January 2000, to conduct research in the place that was thought to be one of the most important feeding areas for juvenile sea turtles in Uruguay.

After these preliminary activities, it was confirmed that at least four species of sea turtles occur in Uruguayan waters: green turtles (*Chelonia mydas*), loggerheads (*Caretta caretta*), leatherbacks (*Dermochelys coriacea*), and olive ridleys (*Lepidochelys*

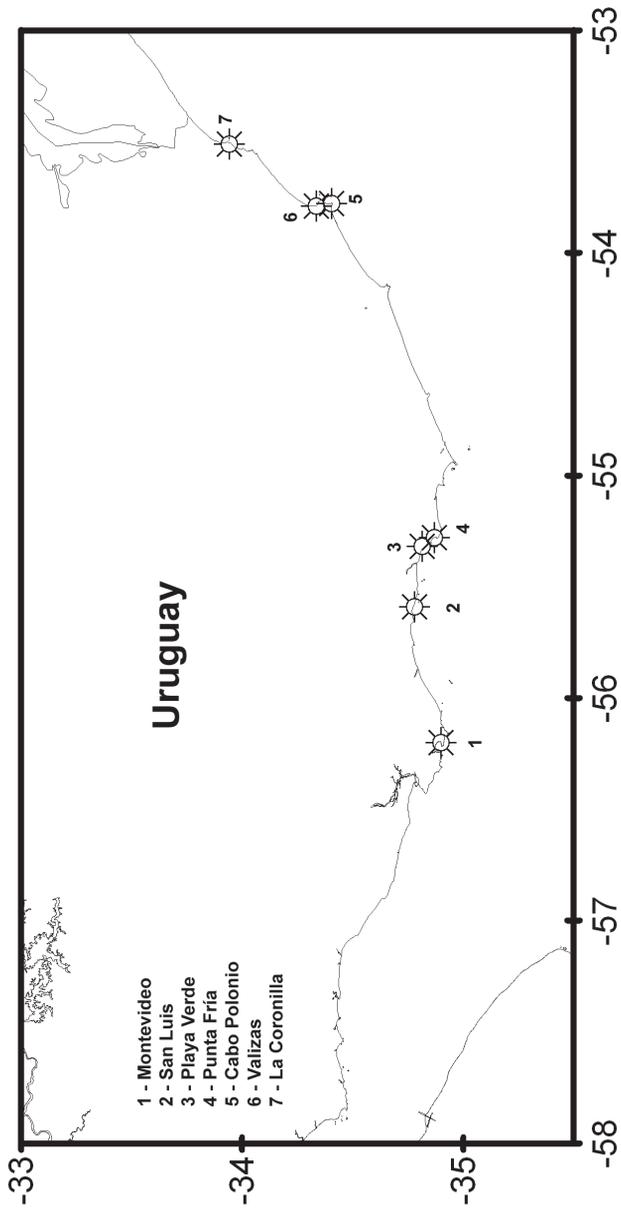


Figure 1. Location of Uruguay and its coastal communities.

lys olivacea), of which the first three occur regularly. It was also found that these animals face many threats while they are in Uruguayan waters, such as interactions with different types of fisheries, ingestion of marine debris, collisions with boats and propellers, trade in carapaces, and occasional isolated events of consumption of their meat. However, one of the greatest problems was a total lack of knowledge in relation to what sea turtles were doing in the southwestern Atlantic Ocean. The vast majority of Uruguayan people had no idea of the existence of sea turtles in our waters, much less the problems they faced or the fact that they are regarded as a globally endangered species and totally protected by national legislation.

As a result, the group developed eight priority areas for research and conservation (López-Mendilaharsu *et al.* 2003a) to address certain aspects of the biology, ecology, and conservation of sea turtles and their habitats, with special concern for the different problems affecting these marine reptiles in Uruguay:

- Ecology and ethology: identify the foraging grounds and assess home ranges, activity patterns and movements of sea turtles in Uruguayan waters.
- Genetics: identify the genetic structure of and the rookeries for sea turtles in Uruguayan feeding grounds, and the stocks that are affected by fisheries in the region, thus enhancing knowledge about the migratory routes and distribution patterns of sea turtles in the South Atlantic Ocean.
- Monitoring of coastal strandings: develop a stranding network to collect all possible information and samples of turtles stranded along the Uruguayan coastline.
- Veterinary studies and rehabilitation: find out which are the most common pathologies that affect sea turtles in Uruguay and minimise the mortality of affected individuals.
- Fisheries interactions: assess the incidental capture of sea turtles in artisanal (gill nets), industrial (trawls and longlines), and sport fisheries, and develop mitigation measures.
- Illegal trade: assess the magnitude of illegal trade in sea turtle carapaces and meat, and develop measures to eliminate this threat by working with various sectors involved, particularly the dealers.
- Environmental education: increase awareness of the endangered status of sea turtles in Uruguay through environmental education activities directed at coastal communities, particularly fishermen and their families, as well as government agencies and the general public; and to promote the involvement and participation of people from various sectors of society in the research and conservation activities carried out by Karumbé.
- International cooperation: strengthen joint work with Brazilian and Argentinean colleagues through the Association for Research and Conservation of Sea Turtles of the Southwestern Atlantic Ocean (ASO), and promote Uruguay's ratification of the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC) and continue providing counsel for the implementation of this and other treaties relevant to sea turtle conservation.

Within the framework of these activities we found ourselves involved in a series of events and interesting experiences that we were originally not prepared for. Working and living side by side with the members of local coastal communities, industrial fishermen, and artisanal fishermen and their families, led us to become involved

firsthand in their lives and realities.

In the beginning, Karumbé and the members of coastal communities were two separate and very different groups. On the one hand, Karumbé was composed of young, enthusiastic university students with a very focused approach to biological sciences and nature conservation, eager to carry out research, but for whom the sea and the coast had been mostly a metaphor for vacations and a change during summer from the busy city life. And on the other hand, the coastal communities comprised a group of people of all ages, from very different cultural, economic, and social environments, many of whom came from communities that had lived in close contact with the sea for generations, whose lives depended directly on the sea and its resources. To achieve the goals of Karumbé, both groups would have to learn to understand and trust each other.

Those trained in social sciences, in community development, and in participatory research might have predicted what we discovered through our own personal experiences. However, social scientists in Uruguay have paid relatively little attention to coastal communities, for the country's economy is focused on beef and dairy production -- despite the fact that marine fisheries are very important socially and economically in Uruguay. Moreover, during our work on the coast, we have observed that the few social diagnostic and assistance programmes that have been carried out with coastal communities in Uruguay are characterised by lack of success. Hence, there is a dearth of information on the coastal communities of Uruguay. As biologists are usually not prepared to deal successfully with situations involving the social sciences, we believe it is valuable to share our experiences. While we began with no social science research design, the results of the open-ended, personal interviews and interactions provide fundamental information on which specific topics can be identified for more focused research in the future. There are many barriers to be torn down, many prejudices to be overcome, and a generous spirit to acknowledge the value of the local people in any research and conservation programme of the kind that Karumbé is developing. Turtles have enabled us to learn that no conservation programme can be efficiently implemented without the cooperation of the local people.

Personal Experiences

To illustrate the process involved in developing close cooperation between Karumbé and various members of coastal communities in our research and community-based conservation activities, we provide some brief, personal accounts. Surely, we could have easily chosen a strictly 'scientific' approach to reporting these experiences, but the valuable local colour, the very essence of it all, would have been lost. These stories, narrated intentionally in the colloquial language used by the young students, biologists, teachers, investigators, fishermen, and the members of their families, show how a scientific task like ours is being performed in the mist of social relationships. Our philosophy has been consistently to be open, transparent, and honest with the people with whom we interact, always intending to respect their knowledge and learn from them. None of these stories would have been possible without the complete commitment that each Karumbé member has had, sharing perceptions and learning with the protagonists of these experiences.

El Gordo and His Chicks – By Cecilia Lezama and Mariana Ríos

The fishing area of the artisanal fleet that operates out of Punta Fría overlaps with an important feeding area for juvenile green turtles in our country. Therefore, the interaction between sea turtles and fishermen is frequent. We made our first contact with this community through a very special fisherman known by the local people as *el Gordo Alfredo* (Figure 2), who year after year has been helping researchers from University's School of Science in a disinterested way. Our first onboard experiences were made with *el Gordo*, and many of Karumbé members will always remember him as a great 'fishing teacher'.



Figure 2. *El Gordo Alfredo* releasing a juvenile fish from a gillnet.

At the port, we were known as *el Gordo's* chicks. At the beginning, many fishermen felt annoyed with our female presence, because this kind of community tends to be very closed, particularly to women, who are outsiders. Then, step-by-step, we slowly gained their respect, by regularly visiting them at their homes. We visited them throughout the year, not only during the summer season when tourists usually drop by, but even on cold winter days. Although not all fishermen are as interested as *el Gordo* is in our project, we now receive frequent offers from many of Punta Fría's fishermen to take us fishing with them every time we go to the harbor.

Recently, Karumbé started a new project in collaboration with the artisanal fishermen of Punta Fría and nearby areas. With the help and support of the local fishermen, we are assessing the incidental capture of sea turtles, in order to imple-

ment conservation strategies to protect the animals that forage in this area. When we asked *el Gordo* about the possibility of working with us, his answer was: ‘You know you can always count on me, you don’t even have to ask.’ So now he has become one of the members of Karumbé team. *El Gordo* is not only an unconditional collaborator in the project, but also a good friend.

Opening Our Minds – By Mariana Ríos and Cecilia Lezama

The case of Daniela and Johnny is an anecdote that we will never forget, because it is the clearest example of receptivity of the fishing community. Johnny is also a fisherman from Punta Fría, who participated in a little Workshop on Green Turtle Biology and Conservation that a member of Karumbé had given to the fishermen of this community the week before this story happened.

One morning we received a phone call from Daniela (Johnny’s wife) telling us about a drowned turtle that had been entangled in Johnny’s net the day before. We went to check on the turtle immediately, because we were told that this turtle was tagged.

We were very excited by this phone call. First, because Johnny was not in the group of fishermen who had been working with us before, (in fact we had no idea who he was, when we got the phone call); and second, because this was a sign that the workshop had been successful in promoting cooperation. When we got to Punta Fría, Daniela and several other people from the community, who were waiting for us, were very worried about having incidentally captured a turtle that was tagged. Our surprise was even greater when they proudly told us that the tag address was from Brazil.

We couldn’t wait to check the address; and yes, it was from the TAMAR Project in Brazil! This was the first report of a tag return for Uruguay, and we were very grateful to them.

We examined the turtle with their help, not only explaining all the steps for measuring and carrying out a necropsy, and why we were doing these things, but in the mean time listening to lots of stories about their lives and experiences. It is not easy to reach this point of exchange with most people in coastal communities. At first they didn’t trust us enough to share any part of their lives and experiences. However, after spending some time talking with them, sharing their same language, relating to their experiences, the situation changed. We enjoyed it very much when we got to the point where we were just friends chatting, and not fishermen versus biologists.

During that chat Daniela confessed that they ate turtle meat, adding that every time there is poor fishing, and a turtle gets drowned in their nets, it is like ‘a gift from God’. She said she felt very bad about dead turtles but explained that ‘You know, we have to feed our kids.’ As soon as we finished analysing the turtle we offered it to them, knowing that there had not been much fish lately. We had learned that as researchers and conservationists, sometimes we have to moderate our feelings and change our priorities in favor of the basic needs of the people. However, Daniela answered with an emphatic, ‘No! You guys take it with you.’

As we were leaving, Facundo, a little boy from Punta Fría, came running to tell us that Johnny’s boat had just arrived to port with another dead turtle (Figure 3). We stayed on to examine it, but this time Daniela and her friends remembered



Figure 3. Mariana with Facundo.

each one of the steps we had used for studying the turtle, and so they took all of the measurements and samples. Once again, the interest shown by our new collaborators and friends was amazing.

Fishing Is Not Only a Subject for Men – By Antonia Bauzá, Cecilia Lezama, Mariana Ríos and Martín Laporta

Like Punta Fría, San Luis is a coastal community of artisanal fishermen, where the same problem of incidental capture of green sea turtles takes place. However, there is a substantial difference between these two communities because most of the fishermen and their families in San Luis do not remain in this place the whole year. This is primarily due to the seasonality of fish availability. People at San Luis live on the beach, along the shore, in very unstable conditions, many of them in small, humble houses with few conveniences. Only a few families, including the family of Elsa and her husband Jorge, *el Viejo*, can therefore be called year-round residents.

We met Elsa for the first time in a meeting organised by the University's School of Science to discuss the problem of the interaction between sea lions and the artisanal fisheries in Uruguay, where she was invited to represent the Artisanal Fishermen's Union of San Luis (AFU).

By going to her house from time to time, we got to know this remarkable woman and her family, and learn that she plays a very important role in this community. Even though she is 'simply the wife of a fisherman', she is a focal point for information and vision for her community, providing invaluable advice for community members. Although she stays on land, she looks after the safety and wellbeing of the fishermen working at sea, and always helps those members of the community with limited education to stay informed about the latest news and developments that affect their lives. The respect this woman has earned from the *macho* fishermen is not commonly seen in Uruguay.

From conversations with Elsa and Jorge we have become aware of many of the problems that the San Luis fishermen have to face. For example, artisanal fishermen are frequently harassed by sea lions, which tear their nets and eat their catch.



Figure 4. Kids taking care of a turtle in San Luis.



Figure 5. Karumbé's friends building the communal house at San Luis.

Another important problem is that there are only three fish buyers at San Luis, which makes the fishermen totally dependent on the prices that these middlemen fix. The San Luis fishermen are also beleaguered by trawlers that often operate near the coast, even though the first five nautical miles are legally reserved for artisanal fisheries. These illegal incursions are often claimed to leave fewer fish for the artisanal fishermen, and sometimes the industrial vessels destroy their fishing gear. These and other factors have important economic repercussions, which are directly reflected in the social and economic status of the fishing community of San Luis: the lack of food and warm clothes, and impoverished homes.

Karumbé has been working for four years with Elsa, Jorge, and their three sons, who are San Luis fishermen as well. During this time, they have learned to trust us increasingly, fully understanding the commitment that we have to our work.

They know how essential their help is for us, and the fact that we are convinced that the people in the fishing community and researchers must work as part of the same team if there is to be success in any conservation project.

Elsa has been helping from the beginning; for example, by phoning us to report whenever an entangled turtle is landed, dead or alive. Yet, this level of cooperation is relatively modest, considering how much we are doing together with the San Luis community now. Our activities now range from working together in building a community centre to be used by the children of the community (Figure 4), the wives of the fishermen, the fishermen's association, and Karumbé, where we share the space and listen to their concerns about economic necessities and social problems, and explore ways to support them in finding solutions. Elsa allowed us to live in her house for many weeks while we were building the communal house. Some friends of ours from Montevideo, who helped in the construction, had their first contact with sea turtles, and a different social reality that they did not know (Figure 5). These friends were very impressed by the hospitality they received from the people of San Luis. In sum, we have become involved in many aspects of their lives.

Karumbé is starting to organise workshops and activities that will involve wives of fishermen in our work. None of these things would have been possible without the unconditional help that Elsa has given us, acting as the link between the San Luis community and our team.

The Biologist-Fisherman – By Mariana Ríos

The story of *Coco*, his dad Juan, and all their family (Figure 6), is rather different from the other accounts. *Coco* is twenty-seven years old, and he had always wanted to study marine biology. The fact that he lives in Playa Verde, some eighty kilometres from Montevideo (the capital city), and that universities in Uruguay are located mainly in Montevideo, made his dream impossible to fulfill.

Initial contact with *Coco* was made by a Karumbé volunteer, who told us about him and the quantity of green turtles that get caught accidentally in his nets. Meeting *Coco* was great! He has been fishing his whole life, just like the other men in his family. They know a lot, not only about the beach they have always lived on, but also about the ocean in general. The most amazing thing is the interest and the respect that *Coco* and all his family show for the ocean, and for nature in general. The



Figure 6. *Coco* with his mother and friends.

fact I like most is that, even though they had the tradition to eat or give as a present the meat of any freshly dead turtle that got caught, they know how to rehabilitate a comatose turtle by applying pressure on its chest, and now they always try to revive turtles. *Coco* was the second person who told us about this technique, as *el Gordo* Alfredo had also told us how to do it.

The fact that *Coco* had always wanted to study marine biology made his comprehension of the biology of the sea turtles easy, and he even kept asking many interesting questions about these species. He also taught us a lot about other marine fauna and flora found in the area.

Every time there was a stranded sea turtle in this area *Coco* would phone us as soon as possible and work on the turtle with us when we arrived. Then we reached a point where he had gotten sufficient training and experience that he started to work up the turtles by himself with our supervision. Nowadays, he has his own field equipment to work on every turtle that gets entangled in his nets, or gets stranded in the area. Besides that, he decided by himself not to fish too close to the rocky coastal areas, where he knows more turtles get caught at a certain time of the year.

I think it is also relevant to say that all of Karumbé members feel at home whenever we are at *Coco's* house. *Coco* and his family have been an unconditional part of this project ever since we met them and are of course an integral part of the Karumbé team.

Turtle Friendship... – By Pablo Sánchez

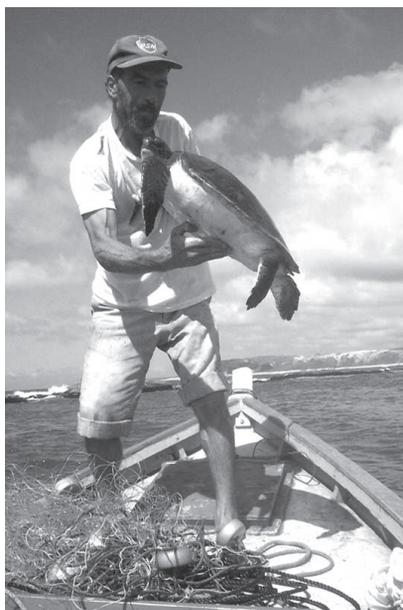
Carlos Romero is a fisherman living close to our research base in La Coronilla, one of the most important feeding grounds for juvenile green sea turtles along the Uruguayan coast. Carlos used to fish with gillnets near the rocky islands, which is one of the places frequented by juvenile green turtles that forage on algae. Turtles often become entangled in gillnets, and many of them drown. Unlike many fishermen at La Coronilla, Carlos works alone with his old father.

My relationship with Carlos started in January 2003, when I was a volunteer in the turtle camp organised by Karumbé. Participating in this camp gave me the opportunity to know about the life style of an artisanal fisherman and his possible relation with a sea turtle project. As time passed, my relationship with Carlos and my understanding of his day-to-day activities turned into a close friendship with numerous invitations to visit his home.

When the camp finished for the season, I had to go back to Montevideo, but with the idea of returning to La Coronilla as soon as possible. In April of the same year, at this stage having a very good relationship with the project, I was invited to participate in Karumbé's Fall Camp. Having acquired better knowledge and more experience in sea turtle handling and data collecting, I accepted the invitation. Arriving at that beautiful place and meeting Carlos again was wonderful! The month and a half that I had spent there earlier gave me invaluable experience, not just for working with sea turtles, but also because my friendship with Carlos (who by this time I called *Carlitos* – a nickname expressing affection) was growing so much! After April, I went many times to visit *Carlitos*; and when the following summer arrived, I decided to spend my holidays in La Coronilla, but *Carlitos* insisted that I had to stay at his home, so I spent that January with him.

At that time, Karumbé had bought a small boat in order to carry out fieldwork

Figure 7. *Carlitos*, during research activities at a green turtle foraging area.



in this area; and *Carlitos* was the skipper, so I had the opportunity to go onboard with him many times, and the lessons from *Carlitos* never stopped (Figure 7). With him, I learned about the artisanal fishery, and about many other things. He used to eat turtle meat and sell carapaces, but now he has chosen to give up these habits. In addition to skippering Karumbé's boat, he helps us surveying the beaches, looking for stranded turtles in order to collect biological data; he has also changed some of his fishing practices to protect turtles.

My friendship with this solitary fisherman has grown enormously, and he has become a special friend and asset not just to me, but also to all of Karumbé.

A Lot To Learn... – By Philip Miller, Mariana Ríos and Martín Laporta

We used to spend most of our summer holidays in Valizas, a tiny seaside village, so we knew that there was a small fishermen's community there. In 2002, when Karumbé decided to carry out research on incidental capture of sea turtles in Uruguay, we had our first opportunity to get in touch with these local fishermen.

During our first field trip we had a few short interviews with several of them, in some cases in their homes. It was in this way we met Gustavo, *Nando, el Cholo, el Tite, el Gallego*, Hugo, Sergio, *el Pindongo, el Canario, el Negro, el Bala* and others. Right from the beginning, they started telling us about their fishing practices and the occasional incidental captures and strandings of sea turtles in their area. They were very eager to share their knowledge with us, which was fantastic! At the same time, we explained to them about Karumbé's research and conservation activities. The fishermen were so excited to learn about our work that they even invited us to speak on their radio programme, to share our knowledge and ideas with all the audience of that little town.

During the following visits to Valizas, the meetings with fishermen were no longer just interviews, but real conversations in their homes, about topics like the

last days' catches, the weather, and their problems with sea lions that break their fishing gear and eat their fish. Some months later, we decided that Valizas was an interesting place to conduct further research. So, we asked Gustavo and Sergio if we could go onboard their vessels with them, to learn about their fishing methods and be there to see what happened with sea turtles. They said we could go with them whenever we wanted; we were delighted with their attitude.

We have made many fishing trips with them, and we have learned a lot during long hours of conversations. We learned that artisanal fishermen often were responsible fishers. One night, heading back to port after many hours of work at sea, Sergio said:

I don't like to think that my work is related with death Every day I go fishing, I kill hundreds of fish Today we killed more than a thousand fish I wish I could kill fifty fish, and earn enough money, because that would assure me that tomorrow, at least there are 950 more fish to be caught...

We had no answer for him and we silently agreed by nodding. Honestly, we had never expected to hear such a discourse from a fisherman.

Another incident that impressed us was when during an onboard monitoring trip we saw Gustavo trying to revive a drowned dolphin onboard his fishing boat. These experiences were incredible and made us feel very strange, because our prejudices about fishermen were annihilated. What a good lesson for us!

We have also learned, firsthand, what strenuous and wearisome work they have. Spending eighteen hours at sea in a small boat, hauling kilometres of gillnets, sometimes loaded with stinging jellyfish, is not a job for everyone. They really have to love what they do to go on. You have to love the sea and respect its wild nature to be a fisherman.

Nando wants to make a catalogue of all the fish species that live near Valizas. He thinks that people would really appreciate the possibility of knowing that part of the local fauna. He has invited us to join him in this project, which we find very interesting. Together with our fishermen friends, we have taken beautiful photographs of their work, and last summer a local handcraft artisan designed an ecological calendar with many of those pictures and stories of our friends at work. This was very nice, as these calendars will allow many tourists to learn about, and appreciate, artisanal fishermen's work at sea.

During a fishing trip, while we were filling our data collection sheets, Sergio told us that he wanted to '*scientificate*' his fishing. We asked him to explain that to us, and his answer was clear,

I see you collecting all these data, and I want to do the same; I want to know the water temperature and location of my best catches Maybe next year the same thing happens ... and I can learn where the fish are or where it is more probable to find fish at certain times of the year.

We were amazed with his comment that seemed to come from a scientist and not from an artisanal fisherman. We helped him design his data sheet, and he has been collecting data for the last year and a half.

Sergio started by helping us to do field work activities, and whenever he saw a turtle, he would let us know (Figure 8). Together we are currently developing alternative fishing methods that will be more selective and efficient than gillnets. We got part of a bottom longline, and Sergio taught us how to set it up and use it. Recently he has begun working on the turtles himself, taking measurements and recording observations on their condition.

During the last holidays that we spent in Valizas, we took a friend who had never been there. It was an amazing experience for him, to be able to share the simplicity, honesty, goodness, and easy friendship we share with these fishermen. We had the opportunity of spending many days sighting turtles from the boat, taking part in fishing trips, and after work playing the drums (a national tradition in Uruguay) and sharing red wine with the fishermen. The last day, our friend from Montevideo told us ‘We have to repeat this on our next holidays!’

The Case of Trawl Fishermen – By Martín Laporta and Philip Miller

Andrés Vidal is an industrial fisherman. Some years ago, while working in a long-liner, he met a scientific onboard observer from the National Program of Observers Onboard the Tuna Fleet (PNOFA), which belongs to the National Direction of Aquatic Resources (DINARA). The observer – besides collecting information on the fishing gear and operation, environmental data, and biological information of the captured fish – was also collecting data about incidentally captured species, such as sea turtles.

Andrés was surprised and curious to see that the observer was tagging sea turtles. The observer explained to Andrés why he had tagged the turtles, and the importance of making efforts to protect this species. He also told Andrés about



Figure 8. Sergio and his crew in Valizas.

Karumbé's efforts with sea turtle conservation.

Some months later, while working on a coastal bottom trawler (Figure 9), Andrés found a sea turtle tagged in Brazil by the TAMAR Project. The onboard observer had told him about the importance of recapturing data, so he collected the tag and took note of the position. As usual, he took the carapace back to port to sell it.

Once in port, he called Karumbé and reported the recapture. The following day, we visited him at his home, where Andrés showed us the tag and the turtle's carapace, which he intended to sell when he needed money. Andrés explained to us that very often sea turtles were incidentally captured in the trawl nets of his vessel. Up to that moment, we had not been aware about the interaction of sea turtles with the coastal bottom trawl fishery in Uruguay. Andrés presented us for the first time with solid information on this interaction.

As we talked with Andrés, we told him about Karumbé, our project for sea turtle research and conservation, and then asked him if it would be possible for him to collect data on the turtles. He answered that it would not be an easy task to accomplish, because turtles are quickly discarded as soon as they are onboard, because having a turtle on deck is a problem. Nevertheless, he said he would try to measure and take pictures of the turtles. So, we taught him how to measure a turtle and we gave him a disposable camera.

Back from his next fishing trip, Andrés called us and we met again at his home. He was very enthusiastic and motivated by the work he was doing with sea turtles. He had collected some information and had taken some interesting pictures. Andrés was interested in learning more about the biology and conservation of sea turtles, so we gave him some reading material, and asked him if he would collect more data on the turtles and about the fishing operation. Andrés said that he would



Figure 9. Coastal Bottom Trawler at the Port of Montevideo.

try, reminding us that the turtles could not be his priority, and that he could only work with them after finishing his labours. Andrés also told us that he had been talking with other fishermen who worked on other vessels, telling them about the activities of Karumbé, and about what he had been doing with the turtles onboard. Some of those fishermen, he said, wished to do the same work that Andrés was doing.

Nowadays, Ernesto, César, Santiago, Jorge, Gustavo, and Daniel have joined Andrés. All of them have been trained to work on the sea turtle conservation programme onboard different bottom trawlers. These fishermen are now the foundation of the Onboard Tagging and Data Collection Programme (PROMACODA), and are fully integrated into the Karumbé team. Besides collecting data and rehabilitating injured turtles, they are also promoting fishermen's awareness regarding the conservation of sea turtles.

During our joint work with these fishermen, they have shown us that they are very much aware of other fisheries problems, such as incidental capture of marine mammals and seabirds, stock-depletion, killing juvenile fish, lack of respect to temporal and area closures and bans, irresponsible fishing, and discards. Many of the concerns that they express are articulate manifestations of the same issues that today's fisheries biologists are wrestling with.

Before we met them, they had their own handling and rehabilitation techniques for sea turtles that were caught accidentally and brought aboard, and we wanted to learn from them to improve the techniques that we were using. For example, every time a leatherback turtle is incidentally captured, it has to be hauled onboard, because it cannot be released or discarded directly from the trawl net while it is in the water. But once it is on deck, a problem arises: How does one get a turtle, which weighs nearly half a ton, safely back into the sea? Normally it is winched up by a flipper and swung overboard, putting tremendous strain on the limb being used to lift it, and usually smashing into the gunwale many times. Ernesto, boat-swain (chief of the deck crew) of a bottom trawler, now uses a lowering device designed by him. He calls this a *chinguillo*, which is simply a piece of reinforced net with straps and ropes that is used with the aid of the winch to lift the turtle. He can then swing it over the sideboard and then slowly lower it into the sea. In this way, the turtle can be safely returned to the sea, decreasing the post-capture damage and mortality.

It is also very interesting to see how concerned these fishermen are when drowned turtles are brought on board. Whenever possible, they use resuscitation techniques, sometimes taking care of the turtles as if they were human. We believe that all these techniques are saving the lives of many turtles.

Karumbé has integrated these industrial trawl fishermen as an important part of the scientific research team. They have demonstrated to us – and to themselves – that they have abilities they were not aware of until they started working with sea turtles, and we in turn, have presented their achievements to the scientific world (Vidal *et al.* 2004; Laporta and Miller in press; Miller, Laporta, and Fallabrino in press). A good example of this is the data sheet for fishing effort developed by Santiago, César and Jorge. We motivated them to design the material they now use, following the philosophy that they were much more than simply 'data collectors', and now we are field-testing their data sheet on two different vessels.

One year after we started working with Andrés, he decided to make use of that first carapace that he showed us, to promote sea turtle conservation, using it for

educational activities at schools, instead of selling it for personal economic benefit. This shows a radical change in Andrés' behavior, the result of a process that included awareness, training, and integration into the project.

We Really Get by With a Little Help from Our Small Friends – By Anita Aisenberg

I passionately believe that children can change the world, and these are not just words. I will make my best effort in trying to transmit in a few lines the heart of our experiences when working with children from the most important fishing communities along the Uruguayan coastline, our teaching and, much more important, our learning from them. I hope our experience helps in motivating and encouraging readers with present and future projects.

In 2002, the Karumbé group decided to take action and approach the artisanal fishing communities along the Uruguayan coastline. Previous surveys showed that in our country incidental capture, especially in trawling and artisanal fisheries, the illegal trading of carapaces, and the consumption of turtle meat were drastically affecting the sea turtles that navigate in our seas. Our aim was to give open talks to community members and organise interactive activities with children along the coastline, to share information and create consciousness about the critical situation of sea turtles, finding ways of working together to help these endangered reptiles.

Twelve localities in total were visited, along 530 kilometres of coast, including the mouth of Rio de la Plata and the Atlantic Ocean. The fishing communities have several things in common: in general, they suffer both nutritional and housing problems, being ignored by the government throughout the whole year, yet remarkably, these same coastal towns and villages turn into fashionable tourist centres during the summer.

Instinctively, we knew it would be a great challenge to work in these conditions. Community members, tired of easy promises from politicians and visitors in the past, having heard too many discourses from outsiders without receiving solutions to their unresolved problems, would not open themselves very easily to strangers. Clearly, we would need to win the confidence of members of these coastal communities.

In this light, we offered to give talks and help with educational activities in the schools. We still remember the surprise on the face of the head teacher from La Coronilla School, the furthest most of those fishing communities from our University in Montevideo, when we appeared with all the materials necessary to work with the children. She said, 'I cannot believe you are here. I thought you were not going to come... Many promises are made for talks to be given to the children by people from the capital, but in the end they never come.' However, we did, and the children, the teachers and principals from each of the schools received us enthusiastically (Figure 10). We listened, answered, asked, drew, played, laughed, and learned together.

Children were eager to know more and more about those mysterious reptiles, which have existed since ancient times and are a symbol of wisdom and peace. Every child had a story or anecdote to share with the rest. Some of them even wrote their own poems and stories. We will never forget the respect children showed on every occasion, sometimes with more than a hundred of them crowded in a small hall. And we will keep in our hearts the images of their faces when they were watching the video on sea turtles, admiring them swimming under the water and whispering



Figure 10. *Kids at La Coronilla School*

phrases as, ‘...look, it seems as if turtles are flying under the sea’. We finished every working day comforted, filled with the energy that children transmit and with lots of new ideas to work on.

Regular visits to the fishing communities opened our eyes to many aspects about the social problems of the area. We found out that many children do not attend their school classes, but that they are very interested in learning about the natural wonders that surround them. Sometimes children got so involved in helping us, that they even taught adults about the importance of taking care of sea turtles. Furthermore, we found out that in San Luis, one of the biggest fishing communities in our country, small children took care of stranded turtles until members from Karumbé arrived, protecting them and helping us collect information about the animals, convinced of the duty they had chosen to perform and excited with the final liberation of the turtles to the sea.

All along the Uruguayan coast, children have decided to become ambassadors of our message, promoting greater interest in the whole community for preserving sea turtles. Grownups, most of them involved in fishing activities, are also showing increasing interest and determination to cooperate with the project. We receive phone calls from all over the coast informing us about stranded or injured turtles, and some fishermen have also decided to help us collect information.

At present, one marine information centre is functioning in La Coronilla, where people can freely receive information on sea turtles. In San Luis, another centre is being constructed where community members will have the possibility to learn to use a computer and have access to internet free of charge. They will also have the possibility of using the centre for meetings and attending courses on handicrafts and other topics. One of our most important aims is to attract children’s interest and make them and their families understand that education opens a wonderful new world they can also be part of. We are also working on the integration of the

fishermen's families with the rest of society.

There is much to do, and the path does seem hard and long, but we will not disappoint the children of the sea. They have showed us they can feel the wonders of nature and understand the fragility of ecosystems, getting deeply involved in a subject that is worthwhile. Turtles are not strangers to them; they have seen them stranded on the beach, trapped in a net or swimming freely near the coast. Turtles are part of their past, of their present, but also of their dreams for a better future.

Kevin, the purple turtle¹

Kevin the purple turtle swims and swims
He can't stop because a turtle he is

Kevin, Kevin, never stop swimming
If you do so I will cry and cry
Cause, Kevin, children know the purple swimmer
Is Kevin the winner

All the children should save
The turtles that surf on the wave
Happiness in the sea, in Kevin's heart and in me

Anwar Martínez (11 years old), Atlántida, Uruguay

Discussion

These narratives of personal experiences demonstrate that the relationship of Uruguayan coastal communities with sea turtles differs somewhat with what happens in many communities in other parts of the world. For some reason, turtles have traditionally captivated Uruguayan fishermen, who respect these marine reptiles. Besides, turtles are not a traditional fishing target, although in times of lack of fish, dead turtles are sometimes used by some fishermen as a source of extra income or for food. So, it is generally relatively easy for a Uruguayan fisherman to decide to protect the turtles, because it does not mean a substantial economic loss.

However, when fishing is poor, the turtle becomes an easy source of meat for fishermen, as we have learned when facing the dilemma of comparing the importance of the life of a turtle with food for the kids of artisanal fishermen. The same thing happens with the illegal sale of carapaces, which in times of poor fishing becomes an attractive alternative source of income for industrial fishermen, thus generating a difficult issue to solve.

Coastal communities and fishermen in Uruguay are normally ignored by our society. Uruguayans undervalue their culture and lifestyle; thus, they have excluded themselves from the mainstream of our society, and they discourage any kind of close contact with visitors and are rather reticent with strangers. At the beginning we had to deal with this challenging situation without being formally prepared for it;

community-based conservation was merely the topic of a paper that some of us had read informally (Frazier, 1999), because we had not been instructed in fundamental aspects of conservation by either our society or by our university teachers. Moreover, those of us trained in the biological sciences receive no formal training in the social sciences, and multidisciplinary approaches are neglected, if not discouraged, in our educational system.

After some time and dedication working in coastal communities, we were not strangers any more, and the fishermen and their families started to feel comfortable with our presence in their communities. Nowadays we are invited to their houses as friends or relatives, and welcomed to share more time with them. A transparent, careful and honest attitude, plus time and patience, coincide in all the stories narrated above, and made the miracle of building up trust possible.

We found out that a very good way to approach the coastal communities and fishermen includes regular contact and constantly sharing of what we are doing and why we are there. In our case, explaining the critical situation of sea turtles to them proved to be fundamental, and we were surprised to learn that many fishermen were themselves concerned about sea turtles, but did not have the knowledge of sea turtle biology and conservation to be able to do anything positive about it.

Now, five years later, Karumbé is a melting pot of people from different backgrounds and socio-economic situations: on the one hand biologists, veterinarians, teachers, students, researchers, and, on the other, industrial fishermen, artisanal fishermen, their wives and children, and other members of coastal communities.

The success of Karumbé in dealing with the fishermen and coastal communities is because we made them understand that they had an important role to play in sea turtle conservation. Now they know that they can be more than passive witnesses, and that they can take on active roles and make decisions about how they want to be involved and what they want to do. This is the essence of our community-based conservation programme today.

The connection between all the stories narrated above is building trust. We valued, trusted, and respected the fishermen's knowledge of the sea, their culture and lifestyle. They trusted us because they could tell that we were doing something important, that we were not just 'using' them. They saw that we were willing to stand the cold and the long hours of hard work, that they knew we were not used to. They learned that we would also be willing to listen to their personal problems, lending a hand or at least a sympathetic ear and that we would also share a good rest, some music, and whatever food we could round up after a day's work.

The integration of fishermen and other members of coastal communities into Karumbé's research and conservation activities have given them the opportunity to communicate problems of the fisheries and also share their socio-economic problems with us. Although not widely appreciated, these problems affect sea turtles in Uruguay. By working with Karumbé, these people have found a way to have their problems communicated to Uruguayan society and put on to the agendas of governmental agencies. Karumbé is working together with fishermen and other members of coastal communities to help them solve some of their problems. By doing this, we are also conserving sea turtles.

Our respect towards the coastal dwellers, our valorisation of their culture and lifestyle, our sensibility towards the problems they face, and the little help we could

offer them, motivated the fishermen and coastal communities to open the doors of their world to us. For the first time in their lives, they received an invitation from a stranger to be part of a team, a fundamental part of a team. As time goes by, they feel more and more their belonging to this team.

Their lives have changed, because they get to learn new things, and they realize that their work is important, that they are respected for what they know and for their share of participation in the project. They now have really begun to understand the fact that they are *part* of Karumbé. They are proud of being part of a scientific team and are willing to work hard to improve every day. This attitude has begun a subtle change in the communities. Being part of a team involves more than participating in its activities; the sense of belonging implies a transformation of the personal identity that brings self-confidence, self-respect, responsibility, and feelings of self-worth.

The fishermen also received the opportunity to express their interest and show their abilities and capacity to be part of a conservation and research programme. None of us would have ever expected this when we started out five years ago.

Karumbé constantly makes Uruguayan society conscious of the important help that fishermen are providing to sea turtle research and of the awareness fishermen have towards sea turtle conservation. This is very slowly forcing a new trend towards a revalorization of these communities by the rest of the society. As this attitude is made public, society sees fishermen in a new light.

We strongly believe that the scientific community must be aware of the importance of integrating local people, to be successful in any conservation programme. No study like ours could be done by ignoring local people. The relationship between any research and conservation programme must be very close with the community living where the work is carried out. If turtles are to be saved, scientists and conservationists will necessarily have to count on the local coastal communities and fishermen for support.

The close cooperation between the academic researchers and the people of the sea has allowed Karumbé to achieve goals that would not have been possible otherwise. A brief synthesis of the achievements in the five years since the creation of Karumbé includes:

- Reductions of post-capture mortality in the bottom trawl fishery due to increased awareness in industrial fishermen and fishermen's innovations to safely lift and release turtles from the deck (Laporta and Miller in press);
- Improvement in the quality and quantity of data on incidental capture in the bottom trawl fishery collected by trained fishermen, thanks to the creation of the Onboard Tagging and Data Collection Program (Laporta *et al.* in press; Laporta and Miller in press; Miller and Laporta in press; Miller, Laporta, and Fallabrino in press);
- Increase in industrial longline fishermen's awareness of sea turtle conservation, noted when they help scientific onboard observers while working on turtles: this has been facilitated by the joint work between PNOFA/DINARA and Karumbé (Carranza *et al.* 2003; Domingo *et al.* 2003; Fallabrino, Domingo, and Domingo 2003; Domingo, Fallabrino, and Laporta 2004; Laporta *et al.* in press);
- Assessment of incidental capture in artisanal fisheries, with identification of the areas with greatest incidence and development of monitoring programmes (Lezama *et al.* 2003; Lezama, Miller, and Fallabrino 2004, in press; Fallabrino,

- Lezama, and Miller in press);
- More than twelve hundred children from coastal communities educated about the importance of the conservation of sea turtles, by being made aware of the threats the turtles have to face all through their lives. Moreover, each child became a motivator for his/her own family and friends (López-Mendilaharsu *et al.* 2003b; Bauzá and Aisemberg in press);
 - Confirmation of the presence of a rarely reported sea turtle species in Uruguayan waters thanks to the reports of trained fishermen, who were aware of the unusual characteristics of some incidentally captured individuals and took samples and pictures, which allowed us to identify them as *Lepidochelys olivacea* (in preparation);
 - Important tag recovery information received as a result of Karumbé's educational programme, which has improved the knowledge on sea turtle migration routes in the Southwestern Atlantic Ocean (Laporta and López 2003; Estrades *et al.* in press; López-Mendilaharsu *et al.* in press);
 - Identification of the two most important foraging and developmental areas for juvenile sea turtles in Uruguay, thanks to the cooperation of artisanal fishermen (Calvo *et al.* 2003, López-Mendilaharsu *et al.* 2003b, in press);
 - Identification of local mega-benthonic invertebrate fauna found in the stomachs of stranded and incidentally captured adult and juvenile loggerhead turtles (*Caretta caretta*), many of which have been made available to Karumbé by artisanal and industrial fishermen: information that suggests that Uruguayan coastal waters are an important foraging and developmental area for this species (in preparation);
 - Determination of short-term movements of juvenile green turtles in foraging areas (López-Mendilaharsu *et al.* in press);
 - First evidence of juvenile green turtle brumation in Uruguayan waters based on the observation and analysis of unusual epibionts (Castro-Prieto *et al.* 2003, in press);
 - Preliminary mixed stock analysis of juvenile green turtles using mitochondrial DNA sequences which showed that many different Atlantic Ocean rookeries contribute to the individuals found in the foraging and developmental areas in Uruguay (Caraccio *et al.* in press);
 - Detection of southernmost records of fibropapillomatosis for the Atlantic Ocean. (Pastorino *et al.* in press a, in press b);
 - Over 500 stranded sea turtles studied on the beaches and over 200 tagged turtles identified both in coastal and oceanic habitats (Estrades and Achaval 2003; López-Mendilaharsu *et al.* 2003b; Miller, Fallabrino, and Etchegaray 2003; Estrades in press; Estrades *et al.* in press; Miller, Laporta and Fallabrino in press);
 - A decrease in the number of people selling carapaces, following increased awareness, as evidenced by many fishermen having switched from selling to fighting against the sale of carapaces (López-Mendilaharsu and Fallabrino 2001; López-Mendilaharsu *et al.* 2003b; 2005);
 - Creation of the Association for Research and Conservation of Sea Turtles of the Southwestern Atlantic Ocean (ASO), a regional working group (Argentina, Brazil and Uruguay), for promoting cooperation on common themes such as standardising working methods and priority actions (Fallabrino *et al.* 2004, in press).

Although Karumbé originally began with eight main thematic areas, showing a distinct focus on issues centred on the biological sciences, with a recognition of the need for public education and outreach, we have now realised that there is a major thematic area that must be addressed: community development, an area that we had originally never intended to embark upon. We feel that our work with the coastal communities of Uruguay has provided many and diverse benefits for these marginal people, the rest of Uruguayan society, the international community of sea turtle researchers and conservationists, and sea turtles themselves.

...marine turtles are model flagship species for both local and international conservation, by conserving these animals and their habitats, vast areas of the planet have to be taken into consideration, and managed adequately. In a word: conserving sea turtles means protecting the seas and coastal areas, which in turn means protecting a complex, interconnected world on which human societies depend. (Frazier, 1999:15).

Turtles have led us a long, long way from the starting point...

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¹ Originally composed in English.

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