Shark Foundation Annual Report for 2011

September 2012

Generall

Foundation

The Foundation continued to be active in shark protection measures in 2011.

Once again the Foundation received some generous as well as smaller donations in 2011 from various large and small shark friends who are intent on supporting our work.

On this occasion we would like to express our heartfelt thanks to all donors, benefactors and sponsors without whose help our work would not be possible!

Trips

In 2011 the President of the Shark Foundation, Dr. Alexander Godknecht, took part in a scientific excursion to the Bahamas. He also had the chance to visit the sites of various projects supported by the Shark Foundation and to meet with the respective project leaders. In the late fall he represented Switzerland and the Shark Foundation at the Annual Congress of the European Elasmobranch Association (EEA) in Berlin.

Satellite tagging Bahamas

In September 2011 the Oceanographic Center of Nova University (Florida, USA) invited Dr. Godknecht to participate in a scientific excursion to the Bahamas. The purpose of the trip was to tag tiger sharks with satellite transmitters in order to learn more about their migratory behavior. The excursion was headed by Professor Mahmood Shivji, Director of the U.S. Shark Foundation and the Guy Harvey Research Institute, and was accompanied by a TV crew from the U.S. television station WPBT2. Three out of four transmitters were tagged to tiger sharks and two of them are still active today. Also see Tiger Shark Migrations for a video clip. The Foundation will support this project financially as of 2012/13.

Project visits

Lemon Sharks Jupiter (Florida): In January 2011 the International Dive Show ("Salon de Plongée") took place in Paris. Professor Samuel "Doc" Gruber and Dr. Steven Kessel, who head the Foundation's Lemon Shark Project in Jupiter, were invited to attend. The consistently positive results of the project and the planning of future activities were topics of a personal discussion. Scientific results from the project will be used especially to back up demands to place lemon and tiger sharks under protection in Florida and throughout the U.S.

Shark Nurseries in Rookery Bay (Florida): After the tiger shark excursion in September 2011, Dr. Godknecht visited the Foundation's Nursery Project in Rookery Bay, Florida. Pat O'Donnell reported only good things about the Nursery Project and commented on how well the work with volunteers was progressing. Nevertheless, returning the Rookery Bay region to its original everglade condition has been strongly delayed over the past years. Some satisfactory progress was made since 2011 after the State of Florida entrusted the U.S. Army Corps of Engineers with this assignment.

During the discussion on projects, the question arose as to where the parents of young lemon sharks originate from. Up until now Pat O'Donnell assumed that they came from the Jupiter region in Eastern Florida, however, Dr. Godknecht knew from the Foundation's Lemon Shark Project that lemon sharks probably do not circle the Florida Keys. The decision was thus made to start a new project together with Pat O'Donnell, Professor Samuel "Doc" Gruber and Professor Demian Chapman. This project aimed at gathering information on the real origin of

the parents of juvenile lemon, bull and hammer sharks in the Rookery Bay /Ten Thousand Islands region, based on tissue samples and data from DNA databanks.
The Foundation set aside CHF 4,000 for a pilot project and will also support a planned, more extensive project.

Whale Sharks Tofo (Mozambique): In October 2011 Dr. Godknecht visited the Whale Shark Project in Tofo, Mozambique, in order to discuss results, progress and further measures with the project leader, Dr. Simon Pierce. The project's objective is to a) evaluate the proper location and then establish a whale shark protection zone, as requested by the Mozambique government; and b) to research the genetics, behavior and migrations of whale sharks both regionally and globally. Progress is being made in both objectives, whereby the bureaucracy in Mozambique does not make it easier to create a whale shark protective zone and will require many years of lobbying.
On the other hand, considerable new and interesting information has been gained on the behavior of whale sharks. They prefer to swim along the edge of rotating ocean currents, so-called "eddies", because of the optimal available food supply (plankton) found there. The whale sharks migrate with the eddies, as confirmed by analyses made of satellite photographs of ocean currents around Mozambique as well as satellite and sonar data collected on whale sharks. The project team, which is currently also researching mantas, has been very productive. However, their work would be considerably simplified if they had such equipment as underwater lasers (to measure whale sharks), cameras, biopsy needles, mobile GPS receivers, and the like. The Foundation will finance the acquisition of any such necessary equipment.
During his stay in Tofo, Dr. Godknecht also gave a lecture on worldwide efforts to protect sharks and on the work of the Shark Foundation.

EEA Conference Berlin
Shortly following his return from Mozambique, Dr. Godknecht represented Switzerland and the Shark Foundation at the Annual Congress of the European Elasmobranch Association (EEA) in Berlin where he gave a presentation on the Foundation's projects. Next to Shark Trust, the Shark Foundation is the most active organization in Europe when it comes to project portfolio and support of shark research projects. During the Congress he was able to cultivate existing contacts and make new acquaintances. Worth special mention are two cooperations that were newly lined up, including a contact between the tiger shark satellite program headed by Professor Mahmood Shivji and Professor Sims' group in England. While Professor Shivji is studying the migrations of tiger sharks around the Bahamas, the Virgin and Cayman Islands as well as the Bermudas with the help of satellites, Professor Sims' group researches the fishing activities of the Spanish fishing fleet in the North Atlantic. Dr. Godknecht managed to establish a contact between the two groups. Combining efforts would make sense since each group employs different methods and the areas of research partially complement or even overlap each other.
A further cooperation was agreed upon between Dr. Godknecht and representatives from the EDGE of Existence Project. The purpose of EDGE (the "Evolutionary Distinct & Globally Endangered" Project) is to optimize species protection. Not all of us can protect species because we lack the financial means and personnel. Accordingly, wildlife protection must focus on the most important species. For EDGE "important species" are those which contribute among other things to the earth's genetic biodiversity. Looking at the tree of life, we see strongly branched, bushy branches as well as relatively barren branches which harbor only a few species. For the diversity of life the protection of species in the barren branches is thus more important than protecting all species of a bushy branch. In order to compare the branches of the tree of life with each other, genetic genealogical trees based on DNA data are generated in very computation-intensive steps and then compared with each another. EDGE does not have sufficient computing capacity for all computations. Dr. Godknecht thus offered Dr. Matthew Gollock, Head of the EDGE Shark Program, available computing resources at the University of Zurich for the purpose of calculating such shark genealogical trees. The project is now under way and in September 2012, the first representative genealogical trees were calculated after ten thousands of processing hours.

US Shark Foundation

The U.S. Shark Foundation was again registered at its seat in Miami, Florida, as a charitable foundation in 2011. Gary and Brenda Adkison, as well as Professor Mahmood S. Shivji,

continue in their function as directors of the U.S. Foundation, which was also self-supporting in 2011.

Total administrative costs to date: approx. CHF 58,000

Projects

Shark Exhibit

The exhibit is currently in storage.

Total expenditures/investments to date: approx. CHF 234'700

Shark Identification

Professor Mahmood J. Shivji from Nova University in Florida and his colleagues worked on various shark research projects in 2011. During this year, and with the established methods of shark species identification, the laboratory examined more specific questions regarding parthenogenesis, the worldwide genetic investigation of bull shark and hammer shark populations and the migrations of tiger sharks, while research continues on the genomic DNA of sharks. In 2011 no financial support was provided for these diverse projects. In 2012 projects are to be supported in the scope of the angel shark project in Grand Canary Island and tiger shark migrations. At the end of 2011 approximately CHF 30,000 were already set aside for these projects and transferred to the U.S. Foundation's account.
No requests for financial support were received in 2011.

Investments 2011: 25,000 CHF
Total investments to date: approx. CHF 186,000 CHF

Shark Nurseries

The Shark "Nurseries" project in Rookery Bay, Ten Thousand Islands, continues to be managed by Pat O'Donnell together with the Mote Marine Lab. In 2011 work continued on data acquisition. Together with Professors Samuel Gruber and Demian Chapman, and using information from genetic databanks, they are searching for the regional origin of the parents of juvenile lemon, bull and hammer sharks.
The foundation supports the pilot project with $5,000.

Investments 2011: CHF 9,600
Total investments to date: approx. CHF 41,500

Basking Sharks

The study of basking shark nurseries and their migrations off the coast of Wales and Scotland (scientifically headed by Colin Speedie) has been successful and will continue to receive support from the Foundation. In 2011 the search for basking shark populations was extended to regions which, based on historical data, were rich in basking sharks years ago and could thus be the home of potential nurseries. Research in 2010/11 actually pointed to an increased occurrence of basking sharks in some of these regions. Based on this data the initiation of a satellite monitoring program is planned for 2013 (financed by the Scottish Natural Heritage and Exeter University). In 2011 43 transects were sailed and 80 basking sharks were measured and added to the databank in the space of two expedition weeks.

Investments 2011: CHF 11,000
Total investments to date: approx. CHF 64,400

Bull Shark Tagging Fiji (Subproject 2)

The Foundation has been supporting this project since 2004. In 2011 more detailed research was performed primarily in the area of small-scale movements of bull sharks in the region. In

cooperation with Professor Shivji's laboratory the worldwide bull shark population, including the Fiji Islands, was examined for possible genetic kinships.
No requests for financial support were received in 2011. In the scope of a master's project a small behavioral project (see below) was supported in Fiji.

Investments 2011: CHF 0
Total investments to date: approx. CHF 63,800

Shark Protection Zone Fiji

Today the Fiji Shark Protection Park Project is self-supporting. If necessary, the Foundation will support the project financially. At the end of 2011 Mike Neumann requested support for the "Fiji Shark Count" Project to be initiated in 2012 for the purpose of recording all sharks in that region. The Foundation will support this project in the scope of its financial means.

Investments 2011: CHF 0
Total investments to date: approx. CHF 31,300

Lemon Sharks Jupiter (Florida / USA)

Data collected in this project led to the statewide protection of lemon sharks in Florida in March 2010. The research period 2011 lasted from January 31 to March 15, 2011. During that time a record number of 62 sharks, 45 of them lemon sharks, were tagged and measured. Eighteen lemon sharks were implanted with Vemco acoustic transmitters. Moreover, all data from the stationary Vemco acoustic receivers were secured during the season. A total of almost 42,000 signals were evaluated from 25 tagged lemon sharks.
The problem with stationary receivers is the sheer fact that they are stationary and thus only cover a relatively small section of the coastal region. This makes it difficult to find new or additional lemon shark aggregations. In 2011 an experiment was continued that had already begun in 2010. Several, "stationary" receivers were attached to buoys and then pulled behind a boat that travelled between the Jupiter and Palm Beach inlet. This new technique is known as "acoustic fishing" and is still in its early stages. Yet in 2011 no less than 26 signals were received from 16 different lemon sharks located outside the area of the stationary receiver(s) using this technique. These experiments will continue in 2012.
In 2011 studies confirmed that lemon sharks migrate seasonally and move in accordance with a water temperature suitable to them. As concerns seasonal migrations a difference was also discovered between males and females. Females return to the North earlier than males. The Shark Foundation has financed this project completely ever since 2006.

Investments 2011: CHF 19,150
Total investments to date: approx. CHF 99,000

Completed: Shark Protection Hong Kong

The project was completed beginning of 2011

Total investments: CHF 15,000

Angel Sharks on Canary Islands

This project concentrates on examining the angel shark population around Grand Canary Island in order to more effectively protect the last habitats and nurseries found around the Canary Islands. Between 2008 and 2011 more than 150 tissue samples were collected and sent to Professor Mahmood S. Shivji's laboratory for molecular biological kinship analysis. In 2011 the Foundation transferred CHF 22,000 to the account of the US Shark Foundation for these genetic analyses of populations. Unfortunately, the start of these analyses was delayed due to lack of specialists. They were rescheduled for 2012/13 and will be performed in cooperation with the University of Birmingham.

Investments 2011: see Identification
Total investments to date: approx. CHF 23'700

Whalesharks Mozambique

Whale sharks are on the IUCN Red List and Addendum II of CITES. The coastal region near Tofo Beach in Mozambique is an internationally significant region where whale sharks gather during the plankton bloom. The project was initiated in response to a request from the Mozambique government. In order to establish a marine protection area for whale sharks off its coast, Mozambique needs a scientifically-backed recommendation on the location and ideal size of such area. In October 2011 the President of the Shark Foundation visited the project and was impressed by the team's very valuable work directed at protecting whale sharks.

Scientific Progress: In 2011 additional documentation was compiled and whale shark migrations were analyzed based on information collected with the acoustic transmitters financed by the Shark Foundation and on already established photo identifications made by the team. The studies revealed that whale sharks prefer to move along so-called "eddies" of rotating ocean currents. In 2011 it was possible to submit two manuscripts to scientific publications.

Political Progress: The project leader, Simon Pierce, took part in various national hearings on whale shark protection zones. The Ministry of Tourism clearly endorses a marine protection zone for whale sharks, while the Ministry of Fishery definitely opposes it. Much lobbying will thus still be necessary before it is realized. The "Marine Megafauna" team in Tofo also teaches local fishermen how to deal with whale sharks and about environmental protection. Their aim is to have conservation more firmly entrenched in the minds of the simple local population. Some of these fishermen were successfully trained to be diving teachers.

In 2011 not all Foundation funds allocated to the project in 2010 (amounting to CHF 11,700) were used and only a minimum of requests for additional funds were received. In 2012 the Foundation plans to reinvest in the project.

Investments 2011: CHF 120
Total investments to date: approx. CHF 31,300

New Project: Thermoregulation Nurse Sharks

For thousands of years, adult nurse sharks (Ginglymostoma cirratum) have most likely been returning to the Dry Tortugas shallows to court and mate in June and July. Using kayaks and simple nets, our research team has tagged, released and studied over 100 female nurse sharks during the past 21 years.

Sharks chose specific habitat for various reasons at different times of their lives. The relevance of this project is to understand the requirements for reproductive success in shark populations by elucidating the need of pregnant females for specific temperature regimes. Temperature is one of the most critical factors determining the distribution and success of animal populations. Female nurse sharks mate in shallow lagoons in June and July. Some of these females return to the same lagoons in autumn to bask in the warm shallow waters. It is our hypothesis that they seek out these waters to warm their bodies, much as reptiles do, to facilitate gestation and an early parturition.

With the help of Hai-Stiftung, we purchased 14 CEFAS G5 temperature/depth recording tags to place on adult female nurse sharks. As our sharks return to the Dry Tortugas mating site bi- and triennially, it was decided to deploy half the tags in 2011. The other half is planned for 2012.

Investments 2011: CHF 6,600
Total investments to date: approx. CHF 6,600

Short-term Projects

Examination of sharks for symptoms of stress:

Sharks are subjected to various stress factors when they are caught. The objective of this study is to determine on the one hand if and how various shark species react to stress and which catch methods are best suited for their scientific examination. For his studies, the veterinarian, M. Hyatt used the well prepared infrastructure of the shark nursery project in Ten

Thousand Islands (Florida, USA). Hyatt examined three shark species: bonnethead, bull and lemon sharks and studied their reactions to being caught with longlines, respectively nets, also taking into account the water temperature. The degree of stress was determined based on carbon dioxide, carbonic acid and lactate blood parameters measured shortly before the catch and shortly prior to their release. He was able to prove that despite the hooks, longline catches caused less stress than nets, probably because they can still move around and breathe relatively freely. However, strong differences were also observed between the individual species. Bonnethead sharks are considerably more sensitive than lemon sharks, while bull sharks hardly manifest any signs of stress. However, all species have one thing in common: the higher the water temperature, the higher the lack of oxygen and hence the higher probability of death.
The conclusions reached by these scientific studies on sharks are thus clear: Longlines should have preference over nets; catch instruments must be controlled frequently to minimize any possible stress on the sharks; various species react differently to stress, with bonnetheads being especially sensitive; and the warmer the water, the faster the procedure should be carried out.
These results are also extremely important when it comes to tagging sharks with very expensive satellite transmitters. The higher the survival rate of a tagged shark, the more data can be evaluated with the satellite transmitters. On board the ship it is easy to determine the carbon dioxide, carbonic acid and lactate blood parameters. The survival rate of sharks that are caught to be tagged can be strongly increased using blood buffers that are attuned to the specific weight of the shark.
In 2011 a scientific publication was submitted that was published in 2012: Publications
Project leader: Michael Hyatt
Total investments 2010/11: 9,500 CHF (2012 successfully completed)

Juvenile lemon sharks diet:
In Bimini (Bahamas) a study was performed on whether the nutritional patterns of young lemon sharks change as a result of massive disruptions in their nursery environment (holiday resort, large-scale deforestation of mangroves). Results show that the species mix in the coastal region has hardly changed. Nevertheless, more extensive changes were noted in the juvenile sharks' hunting behavior and hence their prey. Their stomachs were found to increasingly contain such waste products as chicken bones, clams and nonindigenous fish, all of which clearly point to increased human influence. For young lemon sharks it is probably more energy efficient to feed off human waste products than to hunt actively themselves.
Project leader: Ornella Weideli (Master thesis University of Basel)
Total investments 2011: 3,600 CHF (2012 successfully completed)

Impacts of catch-release fishing on elasmobranch fishes:
The Foundation supported the start-up financing of a larger project aimed at examining the effects of fishing on sharks. Sharks are also killed for research purposes, respectively scientists also use sharks which stem directly from commercial fishing or land as bycatch, or which are caught and killed by sport fishermen. The project studies the general ecological risks for sharks and evaluates various methods to acquire scientific data from living sharks.
One scientific publication appeared in 2011 and a second one was submitted and published in 2012: Publications
Project leader: Neil Hammerschlag
Total investments 2010/11: 9,500 CHF (no further grants requested)

Individual, sex- and species-specific behaviour in three species of reef sharks, Fiji:
This project examined the spectrum of shy to bold traits with regard to intra- and interspecific and sexual differences between these three shark species. Results showed clear distinctions between the individual species and the sexes.
Project leader: Kirsty Richards and Jürg Brunnschweiler
Total investments 2011: 4,500 CHF (2011 successfully completed)

Public Relations Activities of the Shark Foundation and Shark Info

Media / Public Relations

Also in 2011, the Shark Foundation and OceanCare were again given the opportunity to design and publish free of charge a double-page spread in the current issue of Tui SPIN Out (April 2011 - April 2012) to promote the protection of dolphins and sharks.

Moreover, the Foundation gave interviews or provided expert opinions on shark themes to Galileo Big Pictures, "Beobachter Natur", Swiss Tourism, Playboy (unfortunately no author copies received ;)) and also collaborated in TV productions.

Web Server

In 2011 the Shark Foundation's German web site (www.hai.ch) recorded approx. 198,500 visits, the English web site (www.shark.ch) roughly 315,000. Clearly leading in popularity in the sides frequented on both servers was the Shark Database. Compared to 2010, a slight decrease in the number of visitors to both servers was registered.

Administration

Financial Policy of the Shark Foundation

Established on August 29, 1997, the Shark Foundation is an internationally active organization that falls under the supervision of the Federal Department of Home Affairs (FDHA) / Swiss Federal Supervisory Authority in Bern. The Foundation can accept tax-deductible donations and once a year it submits its annual report and financial statement to the supervisory authority for approval.

The Foundation finances all its activities through donations, presentations or the sale of products such as T-shirts or plush toy sharks. The Board of Trustees works on a voluntary basis and its members receive neither attendance fees nor salaries. The Foundation runs a "Shark Shop" on its Internet website (T-shirts, cuddly plush toy sharks, tear-off notebooks, postcards, shark sponsorships). Sales revenues flow directly into the Foundation account, and once a year all interested parties are sent a mailing requesting donations and including a pay-in slip.

In its first meeting of the respective year, the Board of Trustees of the Shark Foundation decides on the usage of any accumulated income and donation money from the previous year. Up until then no reserves are set aside; instead all funds are released to cover ongoing projects, investments and administrative costs. The annual accounts for both the Foundation and Shark Info are checked by Revisal, an auditing company located in Gossau.