

# MISSION REPORT

## CABO VERDE

*15 September – 5 October 2017*



*Monaco Explorations camp on the islet of Branco. 17–21 September 2017.*

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*Monaco Explorations – July 2020*

[www.monacoexplorations.org](http://www.monacoexplorations.org)



At the behest and under the leadership of H.S.H. Prince Albert II of Monaco, in 2017 the Principality reconnected with a great tradition: exploring at sea to learn, understand, raise public awareness and take action to protect and sustainably manage the oceans.

*Monaco Explorations operates at the intersection of most of the issues that are important to me, and as such has really struck a chord with me. It is also a venture that reflects the best traditions of the Principality, and which speaks to all of humanity.*

H.S.H. Albert II, Prince of Monaco

*Monegasque participants in the Cabo Verde 2017 mission:*



# Contents

- 1 - Introduction**
- 2 - Monaco Explorations - “Reconnecting Humanity and the Sea”**
- 3 - Monaco Explorations organisational chart**
- 4 - The mission Cabo Verde in figures**
- 5 - H.S.H. Prince Albert II of Monaco’s involvement in the mission**
- 6 - Scientific activities conducted in Cabo Verde**
  - 6.1** - Recovery and deployment of underwater robots
  - 6.2** - Study of the herpetofauna on the islet of Branco
  - 6.3** - Study of the herpetofauna on the islet located off the coast of Sal Rei (Boa Vista)
  - 6.4** - Deployment of underwater camera units
  - 6.5** - Focus on sea turtles
  - 6.6** - Megafauna study
- 7 - Public engagement activities**
  - 7.1** - Live from Cabo Verde: strong engagement with the educational community
  - 7.2** - Publication of a booklet on the herpetofauna of Cabo Verde
  - 7.3** - 360° VR film: “The mystery of the giant lizard”
  - 7.4** - Reissue of an educational booklet on sea turtles
  - 7.5** - 2017 and 2018 highlights

## **Acknowledgements**

## **Partner institutions**

**Appendix 1** - List of mission participants

**Appendix 2** - List of reports and publications by the mission scientific teams



## 1 - Introduction

In May 2017, the Principality of Monaco asked the Republic of Cabo Verde to host a Monaco Explorations scientific mission in waters under their national jurisdiction. The mission would primarily involve local teams, and would seek to study biodiversity in the archipelago, and to increase awareness of this biodiversity through numerous public engagement activities.

Given the description of the Monaco Explorations project, the scientific mission and the public engagement initiatives planned during the mission, and despite a very tight schedule, the authorities in Cabo Verde kindly issued the authorisations required to allow the mission to proceed smoothly, including for entry to and navigation of territorial waters, for entry into protected areas, for carrying out scientific work and collecting samples, and for scuba diving and photography.

The Principality of Monaco would like to offer its sincerest thanks to the Republic of Cabo Verde, and particularly:

- Dr Jorge Carlos Fonseca, President of the Republic of Cabo Verde,
- Mr Gilberto Correia Carvalho Silva, Minister of Agriculture and the Environment, and his teams, including Ms Sónia Araujo-Lopes and Ms Silvana Monteiro-Roque,
- Mr José da Silva Gonçalves, Minister of the Economy and Employment, and the entire Government of the Republic of Cabo Verde,
- H.E. Mr Jose-Luis Fiahlo Rocha, Permanent Representative to the United Nations,
- Mr José Luis Santos, Mayor of Boa Vista, and all of the official bodies who made this mission possible and enabled productive discussions between the two countries on diplomatic, scientific and cultural issues.



*H.S.H. Prince Albert II of Monaco, and on his left, Dr Jorge Carlos Fonseca, President of the Republic of Cabo Verde. To their right are Pr Dr Peter Herzig, Director of the GEOMAR Helmholtz Centre for Ocean Research, Kiel; Colonel Bruno Philipponnat, Mr Robert Calcagno, CEO of the Oceanographic Institute.*

*To their left are H.E. Mr Bernard Fautrier, CEO and Vice President of the Prince Albert II of Monaco Foundation, and Pr Patrick Rampal, President of the Monaco Scientific Centre. Monaco Ocean Week 2018.*

*© Michel Dagnino. Oceanographic Institute.*

The productive discussions which developed around the mission were continued as part of establishing new diplomatic relations between the two countries. Dr Jorge Carlos Fonseca, President of the Republic of Cabo Verde, accompanied by a sizeable delegation, paid a working visit to Monaco from 10 to 12 April 2018 during the 2<sup>nd</sup> Monaco Ocean Week.

The Principality of Monaco would also like to thank the numerous partners and organisations who participated in or contributed to the work of this mission in their own ways. These include the University of Cabo Verde (UniCV), the Instituto Nacional de Desenvolvimento das Pescas (INDP), the GEOMAR Helmholtz Centre for Ocean Research, Kiel, Germany, and all of the scientists involved on the ground, especially those from the Queen Mary University of London and the Turtle Foundation/Fundação Tartaruga, and from the non-governmental organisation MarAlliance.

In accordance with the authorisations granted, Monaco Explorations hereby provides a report on the scientific and public engagement activities carried out during the mission.

After a short and intensive preparatory period from April to mid-August 2017, the mission took place from 15 September to 5 October 2017. This followed the mission in Madeira from 19 August to 11 September 2017.

The *Yersin* left Cabo Verde's waters on 6 October 2017, heading for the Caribbean and Martinique for a transatlantic mission to study sargassum proliferation.

## **2 - Monaco Explorations - *"Reconnecting Humanity and the Sea"***

In summer 2016, H.S.H. Prince Albert II of Monaco expressed a wish to revive seagoing missions organised and/or supported by the Principality. By launching a major project which brings together, alongside the Prince's Government, important Monegasque organisations with an interest in the oceans (Oceanographic Institute, Prince Albert I of Monaco Foundation, Prince Albert II of Monaco Foundation, Monaco Scientific Centre, Monaco Yacht Club), the Prince sought to make a full contribution to extending the Principality's influence and sharing His commitment to the environment.

The missions aim to add to our understanding of marine ecosystems and human influence on such systems, to encourage a more sustainable and environmentally friendly approach to the oceans. They support local actors and researchers, and also involve international multidisciplinary teams.

Protecting endangered species such as monk seals, sea turtles and sharks, understanding the impact of climate change, the emergence of invasive species or pollution, improving the operation of marine protected areas... the missions are based on observing the ocean while diving, using remotely operated vehicles, right down to plankton and viruses invisible to the naked eye, or on seeking out animals that tend to evade being seen, using new and sophisticated techniques for studying biodiversity, such as environmental DNA.

In late 2016, the Monaco Explorations steering committee and the various working groups which were set up established the organisation's objectives: a major scientific and public engagement campaign aimed at nurturing, illustrating and supporting Monaco's commitment to better management of the oceans as a means to "Reconnecting Humanity and the Sea".

As part of the project structure that was put in place, led by Colonel Bruno Philipponnat, the campaign unit, headed by Mr Robert Calcagno, was given the responsibility of coordinating the scientific content and public engagement aspects of the various missions, in concert with the other units.



### 3 - Monaco Explorations organisational chart\*

\*Note: organisation and chart at the time Monaco Explorations was launched.

#### Steering Committee:

- **Colonel Bruno Philipponnat**, Chargé de mission to H.S.H. Prince Albert II ; Project Leader
- **Mr Robert Calcagno**, CEO of the Oceanographic Institute, Prince Albert I of Monaco Foundation; Head of the Scientific Campaign Unit
- **Pr Patrick Rampal**, President of the Monaco Scientific Centre; Head of the Scientific Steering Committee
- **Ms Armelle Roudaut-Lafon**, Director of Maritime Affairs for Monaco; in charge of the *Yersin*
- **Mr Jean-Marie Véran**, Special Advisor to the Minister of Foreign Affairs and Cooperation; Head of the Administrative Unit
- **Mr Thierry Apparu**, Head of the Communications Unit

#### Operational team:

- **Ms Lea Lippisch**, Coordinator
- **Ms Marion Faivre**, Coordinator

#### Diving and medical support:

- **Mr Pierre Frolla**, Dive Manager
- **Dr Philippe Afriat**, **Pr Yann-Erick Claessens** and **Dr Olivia Keita-Perse** from Princess Grace Hospital, medical support managers

#### Scientific Steering Committee:

The image below shows the members of the Monaco Explorations Scientific Steering Committee.



The Oceanographic Institute was particularly heavily involved in ensuring the success of this mission. The mission leader, Mr Pierre Gilles, Project Manager in the Institute's Ocean Policy Department, provided scientific coordination for the mission, under the direction of Mr Olivier Dufournaud.

#### 4 - The mission to Cabo Verde in figures



*The Cabo Verde archipelago*

The mission took place from 15 September to 5 October 2017, with 20 days on board the M/V *Yersin* including:

- arrival in Cabo Verde on 15 September,
- 17 operational days (16 September to 2 October),
- 3 logistical stopover days (3 to 5 October).



*The Yersin in Cabo Verde, off the coast of Sal Rei. © Pierre Gilles. Monaco Explorations.*



## 5 - H.S.H. Prince Albert II of Monaco's involvement in the mission

H.S.H. Prince Albert II of Monaco joined the mission in Cabo Verde from 21 to 23 September 2017. H.S.H. the Sovereign Prince was welcomed at Praia Airport on 21 September 2017 by President Jorge Carlos Fonseca. The following day, H.S.H. the Sovereign Prince and President Jorge Carlos Fonseca, together with their advisors, travelled on board the Prince's aircraft to Mindelo on the island of São Vicente. They were greeted by the Mayor of São Vicente, the Regional Police Chief and Cabo Verde's Head of State Protocol, and by Mr Robert Calcagno, CEO of the Oceanographic Institute and Head of the Monaco Explorations Campaign Unit.

H.S.H. the Sovereign Prince then visited the Ocean Science Center Mindelo (OSCM), where he was welcomed by Pr Astrigilda Silveira, Vice Rector of the University of Cabo Verde, Dr Osvaldina Silva, President of the Instituto Nacional de Desenvolvimento das Pescas (INDP), and Pr Dr Peter Herzig, Director of the GEOMAR Helmholtz Centre for Ocean Research, Kiel.

Mr Carlos Ferreira Santos, Germany's Honorary Consul in Cabo Verde and Head of the OSCM, served as the master of ceremonies for the event. Following some introductory words from the three leads, H.S.H. Prince Albert II of Monaco gave His speech. Mr Robert Calcagno, Mr Rui Freitas, Scientific Manager for the Monaco Explorations Cabo Verde Mission, and Dr Björn Fiedler from GEOMAR then presented the mission.

Once the presentations were over, H.S.H. the Sovereign Prince, accompanied by Robert Calcagno, moved to the OSCM videoconference room for a Skype discussion with 267 primary and secondary school pupils in Monaco, who dialled in from the Conference Hall at the Oceanographic Museum of Monaco. Mr Patrice Cellario, Minister of the Interior, Ms Isabelle Bonnal, Director of Education, Youth and Sport of Monaco, Ms Armelle Borro, Manager of the Teacher Training Centre, Ms Habiba Taouche, Science Teacher at the International School of Monaco, representing Mr Francis Gianni, Director of the International School of Monaco, and Mr Olivier Dufourneaud, Director of Ocean Policy at the Oceanographic Museum of Monaco coordinated the questions from Monaco.

*Funded by Monaco Explorations: part of the cost of the reception at the OSCM; the remaining costs were met by GEOMAR.*

H.S.H. Prince Albert II then headed to the Docas restaurant in Mindelo for an official lunch given in his honour by President of the Republic of Cabo Verde Dr Jorge Carlos Fonseca.



H.S.H. Prince Albert II presents Dr Jorge Carlos Fonseca with one of the five Cabo Verde giant skink specimens collected on the islet of Branco by Prince Albert I in 1901. © O. Borde. Monaco Explorations.

H.S.H. Prince Albert II donated to the Republic of Cabo Verde one of the five Cabo Verde giant skink (*Chioninia coctei*) specimens collected by Prince Albert I on the islet of Branco in 1901. The specimen was prepared by the Oceanographic Museum of Monaco, from whose collections it came. This donation was particularly significant because the giant skink is now considered to be extinct and Cabo Verde has not preserved any specimens of the species. It therefore represented a return to the country of an important example of genetic, scientific, historical and cultural heritage. The donation led the President of Cabo Verde to consider establishing a natural history museum, which would share and promote the archipelago's remarkable biodiversity to as many people as possible. After lunch, H.S.H. Prince Albert II invited President Jorge Carlos Fonseca and his delegation to visit the *Yersin*, and particularly the vessel's bridge.

Following the departure of President Jorge Carlos Fonseca and his delegation, the *Yersin* left the Port of Mindelo and headed towards the islet of Branco, where it would pick up the team of scientists, naturalists and fishermen that the Monaco Explorations mission had landed on Branco three days earlier to study the islet's reptiles.



In difficult seas, H.S.H. Prince Albert II and Mr Robert Calcagno pick up herpetologists Dr Raquel Vasconcelos and Dr Aurélien Miralles from the islet of Branco. © O. Borde. Monaco Explorations.

During dinner on board the *Yersin*, H.S.H. the Prince received an update on the research undertaken from scientists Dr Raquel Vasconcelos from CIBIO-InBIO, University of Porto and Dr Aurélien Mirallès from the Museum of Natural History, Ms Sónia Araujo-Lopes, Director of the Nature Conservation Department in the Cabo Verdean National Directorate of the Environment, and naturalist Mr Kenny Delgado (of the local association Biosfera1).

The *Yersin* then made its way to the island of Boa Vista, where it docked early in the morning of 23 September 2017, at the Port of Sal Rei.

In the very early hours of the morning, Dr Björn Fiedler, a researcher at the GEOMAR Helmholtz Centre for Ocean Research, Kiel, gave a presentation to H.S.H. the Sovereign Prince on the operation of the remotely operated underwater vehicle Wave Glider, which was carried on board the *Yersin* and subsequently deployed at the end of the Cabo Verde mission.



*Dr Björn Fiedler explains to H.S.H. the Sovereign Prince and Mr Calcagno how the Wave Glider works.  
© O. Borde. Monaco Explorations.*

H.S.H. Prince Albert II then took part in a feedback and discussion workshop on board the *Yersin*. The workshop was led by Dr Christophe Eizaguirre from Queen Mary University of London and attended by 15 representatives from ten Cabo Verde non-governmental organisations or scientific institutions involved in protecting sea turtles. Ms Sónia Araujo-Lopes, coordinator of the national sea turtle conservation plan, also attended the workshop.

Following this very fruitful discussion, H.S.H. the Sovereign Prince and Mr José Luis Santos, the Mayor of Boa Vista, accompanied by an official delegation and the workshop participants, visited the beach of Curral Velho in the south-east of Boa Vista for a field trip to one of the numerous sites where loggerhead sea turtles reproduce.



*H.S.H. Prince Albert II, accompanied by Mr José Luis Santos, Mayor of Boa Vista, and Ms Sónia Araujo, representing the Cabo Verde Government and coordinator of the national sea turtle conservation plan, hands out a leaflet on sea turtles to this class of children on a visit to the sea. © O. Borde. Monaco Explorations.*

On site, researchers and non-governmental organisation representatives presented the research conducted by scientists to better understand the lives of sea turtles, study their movement and behaviour using various tags, examine their metabolism and determine the turtles' sex after hatching.

H.S.H. the Sovereign Prince was also able to observe the “nursery”, a protected zone which hosts the nests of displaced sea turtles, and where juveniles are born.

A group of young children, whose day’s activities were focused on sea turtles, were presented with an environmental education and awareness booklet, to which Monaco Explorations contributed.

Following this visit, H.S.H. the Prince invited Mr Carlos Santos, Mayor of Boa Vista, for lunch on board the *Yersin*. He left the airport in Sal Rei late in the afternoon, to travel to Nice.

### **Political, scientific, awareness and public engagement outcomes**

On the science side, in addition to the core outcomes, the mission to Cabo Verde helped to strengthen relations with scientists in the country.

During the mission, Monaco Explorations staff and representatives from Monaco were able to meet key stakeholders working to protect iconic species or on issues of importance to the Principality. Follow-ups are already underway, through a variety of collaborative projects:

- consideration is being given to the creation of a centre for national collections in Cabo Verde (with the University of Cabo Verde);
- study and protection of sea turtles with the Fundação Tartaruga / Turtle Foundation, Boa Vista;
- study and protection of sharks with MarAlliance, or oceanography in general in conjunction with the GEOMAR Helmholtz Centre for Ocean Research.

### **Political action to develop marine protected areas**

One of Monaco Explorations’ objectives is to promote the development of marine protected areas through political action and public engagement.

Marine protected areas are key tools in helping to meet biodiversity conservation and sustainable development objectives since they prevent the erosion of marine biodiversity, improve ecosystem resilience, and contribute to sustainable fisheries and the survival of local communities. They are also sentinels of climate change.

The decision to establish a marine protected area is first and foremost a political, legal and administrative process involving the authorities of a sovereign state.

H.S.H. the Sovereign Prince is personally involved in promoting the expansion of marine protected areas across the globe, through the discussions He has had and will have in future with political leaders in the countries visited by Monaco Explorations.

The work carried out on this mission was directly linked to the issue of marine protected areas.

## **6 - Scientific activities conducted in Cabo Verde**

These activities, which took place from 15 September to 2 October 2017, were as follows:

- Recovery of a remotely operated underwater vehicle, Bottom Lander, from Senghor Seamount on 15 September and redeployment off the coast of the island of Santa Luzia on 16 September;
- Deployment of another remotely operated vehicle, Wave Glider, on 2 October;



- Study of the herpetofauna on the islet of Branco from 17 to 21 September; donation of a Cabo Verde giant skink specimen by H.S.H. the Sovereign Prince to the President of Cabo Verde on 21 September;
- Study of the underwater biodiversity of Cabo Verde using underwater cameras on 17 September;
- Focus on sea turtles:
  - o reconnaissance of the various sites from 16 to 19 September, meeting of TAOLA network expert group on 21 September;
  - o report to H.S.H. the Sovereign Prince on 22 September, followed by a field visit to the Curral Velho site;
  - o Monaco Explorations support to scientific monitoring through the funding of tags to study turtle behaviour;
  - o funding of the reissue of an educational booklet on sea turtles.
- Study of Cabo Verde megafauna (sharks and manta rays) from 25 September to 1 October.



Location of scientific activities carried out in Cabo Verde. © Monaco Explorations.

## 6.1 - Recovery and deployment of underwater robots

Several scientific organisations and a fishery management body in Mindelo (São Vicente) are conducting joint oceanographic research programmes in Cabo Verde. Monaco Explorations' trip to the archipelago provided an opportunity for this working group to complete part of its research programme, by recovering underwater robots and deploying them to sites a long distance from Mindelo.

The team that took part in this work comprised Dr Björn Fiedler, chemical oceanography, GEOMAR Helmholtz Centre for Ocean Research, Kiel, Germany, Ms Luciana Génio, PhD, postdoctoral researcher, Centro de Estudos do Ambiente e do Mar, Departamento de Biologia, University of Aveiro, Portugal, Ms Jessica Cibelle Fonseca de Matos, student, University of Cabo Verde, Ms Corrine Almeida, biological oceanography, University of Cabo Verde, Faculty of Engineering and Marine Sciences, and Ms Silvana Monteiro Roque, Representative of the Cabo Verde Government and observer.



The work involved recovering a Bottom Lander from Senghor Seamount on 15 September, and redeploying it the following day off the coast of the island of Santa Luzia, then deploying GEOMAR's Wave Glider off the coast of Santa Luzia on 2 October.



From left to right: Ms Jessica Cibelle Fonseca de Matos, Ms Silvana Monteiro Roque, Ms Corrine Almeida, Ms Luciana Génio, Dr Ana Brito, Dr Björn Fiedler. © O Borde. Monaco Explorations



*15 September 2017. The Bottom Lander is recovered from the summit of Senghor Seamount then hauled on board to collect biological samples and numerical data. © P. Gilles. Monaco Explorations.*

## 6.2 - Study of the herpetofauna on the islet of Branco

The islet of Branco is located 40 miles from Mindelo. Classed as a protected area, it is a genuine wildlife sanctuary (seabirds, sea turtles, reptiles). This extremely fragile islet was once home to the Cabo Verde giant skink, a native species only found in this archipelago.

It is extremely difficult to work on Branco, which is a remote, inhospitable islet. Access is complicated and dangerous (there is no port and there are no sheltered areas on the rocky coastline). Few researchers obtain permission to work in this fragile, protected area. It is difficult to move around the islet without having an impact on the ecosystem.



*The islet of Branco coming into view. © P. Gilles. Monaco Explorations.*



*The Monaco Explorations camp on the islet of Branco. © O. Borde. Monaco Explorations.*

As a reminder, prior to this mission, Dr Raquel Vasconcelos and Dr Aurélien Miralles visited Monaco from 21 to 23 June 2017 to prepare the herpetological programme for Cabo Verde with the Monaco Explorations teams. During their visit, they were able to study in detail the Cabo Verde giant skink specimens collected by Prince Albert I in 1901, which have been conserved in the natural history

collections of the Oceanographic Museum of Monaco. The laboratory study, carried out in partnership with Ms Michèle Bruni, Manager of the Oceanographic Museum's Scientific Collections, focused specifically on the parasites found in the digestive system.



*From left to right: Dr Raquel Vasconcelos, Dr Aurélien Miralles, Ms Michèle Bruni.  
© M. Dagnino. Oceanographic Institute.*

Specimens of this species are very rarely found in museums and are not exhaustively catalogued. Prior to this Monaco Explorations mission, Dr Aurélien Miralles, an expert in the giant skink, was not aware that the Oceanographic Museum's collections included five specimens. Due to their rarity and the fact that the species is now considered to be extinct, the scientific and heritage value of the Cabo Verde giant skink specimens is incalculable.



*One of the five giant skink specimens belonging to the Monaco Oceanographic Museum's collections.  
© Michel Dagnino. Oceanographic Institute.*

On Branco, the two primary goals of the mission were to identify any presence of the Cabo Verde giant skink (*Chioninia coctei*), and to study the other reptiles that definitely live on the island, including the giant wall gecko (*Tarentola gigas brancoensis*), with a particular focus on their diet and their place in the island's food chain, which is heavily dependent on the resources provided by the marine environment and birds.

The following took part in this field operation:

- Dr Raquel Vasconcelos (CIBIO-InBIO, University of Porto), Dr Aurélien Miralles (Natural History Museum, Paris), Mr Kenny Delgado (Biosfera1, Mindelo, Cabo Verde), Ms Sónia Araujo-Lopes, Ministry of the Environment, representative of the Cabo Verde Government and coordinator of the Cabo Verde sea turtle programme,
- a Monaco Explorations team comprising Mr Robert Calcagno and Mr Pierre Frolla, Lieutenant Colonel Philippe Rebaudengo and Mr Olivier Borde,
- a team of journalists from Ushuaia/TF1 (Ms Christine Oberdorff, Mr Arnaud Mouillevois),
- Mr Augusto da Cruz and Mr Daniel Cruz, fishermen from the town of Salamansa, São Vicente, recruited as local guides.



*Mr Robert Calcagno, Dr Raquel Vasconcelos and Mr Kenny Delgado examine the herpetofauna on the islet of Branco. © Monaco Explorations.*

On site, the team carried out a variety of activities: a search for reptiles, the deployment of nine automatic cameras, and the collection of samples (reptiles, arthropods, plants). Three species of reptile were identified: *Tarentola raziana*, *Tarentola gigas brancoensis*, and *Chioninia stangeri*. No signs of past or current presence of *Chioninia coctei* were detected.



*The giant wall gecko, Tarentola gigas brancoensis, a species native to the islet of Branco, photographed at night. © Aurélien Miralles. National Natural History Museum, Paris, France. Monaco Explorations.*



It was confirmed, through observation on the ground of a large female loggerhead sea turtle, that sea turtles lay their eggs on the coast of this islet.

The presence of a very large number of seabirds in the process of nesting was observed.

With regard to the herpetofauna, two students, Ms Katelene Da Cruz Delgado (University of Cabo Verde) and Ms Catarina Pinho (CIBIO-InBIO, University of Porto) were able to work on the samples collected on Branco. Their work resulted in the publication of papers.

On the botany side, the analysis of plant samples on the island by Ms Maria M. Romeiras, an expert in Cabo Verde flora, resulted in the identification of 12 species: *Zygophyllum*, *Polycarpha nivea*, *Zygophyllum simplex*, *Graminea Sporobolus*, *Euphorbia forskalii*, *Frankenia ericifolia caboverdeana*, *Fagonia cretica*, *Calotropis procera*, *Sueda vermiculata*, *Tribulus cistoides*, *Aizoon canariense*, *Forsskaolea procradifolia*.



Two images taken in 1901 during Prince Albert I's visit to Branco.  
© Oceanographic Museum of Monaco collections.

### 6.3 - Study of the herpetofauna on the islet located off the coast of Sal Rei (Boa Vista)

A programme of work focused on herpetofauna was carried out on the islet located off the coast of the town of Sal Rei (Boa Vista) on 23 September.

The team, which was made up of Dr Raquel Vasconcelos, Dr Aurélien Miralles, Mr Kenny Delgado, Ms Sónia Araujo-Lopes, Dr Ana Brito (on-board doctor) and Mr Pierre Gilles, was able to observe and study three species of lizard – *Hemidactylus boavistensis*, *Tarentola boavistensis*, and *Chioninia spinalis boavistensis* – carry out standard examinations (measurements, determination of sex, search for signs of parasites, photographs) and collect tissue and faecal samples.

Signs of probable poaching of sea turtles were detected.

This mission, along with a similar one carried out on the small islet of Curral Velho, off the coast of Boa Vista, produced some recommendations proposing the introduction of conservation measures to protect Branco's terrestrial and aquatic fauna and a communications campaign inspired by the scientific work to raise public awareness of this unique natural heritage.





A specimen of *Chioninia spinalis boavistensis*. © P. Gilles. Monaco Explorations.

The work carried out in June 2017 on the specimens from the Oceanographic Museum of Monaco's collections and the field work on the islet of Branco, on the islet off the coast of Sal Rei (Boa Vista) and on Curral Velho were the subject of several presentations and publications:

- Presentation at the *Herpetologia Iberica* Congress (5–8 September 2018, Salamanca, Spain) of a poster titled “What can we learn from the parasitic nematode fauna of the Extinct giant skink of Cabo Verde?”. Authors: Vicente Roca, Amanda de Sousa, Aurélien Miralles, Anna Perera & Raquel Vasconcelos. 174 people took part in this congress, which was organised by the Spanish Herpetology Association and the Portuguese Herpetology Association. See document No 1 listed in Appendix 2.
- Presentation at the same congress of an oral report on the Cabo Verde giant wall gecko by Ms Catarina J. Pinho, “O que janta a osga gigante de Cabo Verde? *Genética da Conservação para guiar a gestão de reservas em Cabo Verde - What is the giant wall gecko having for dinner? Conservation genetics for guiding reserve management in Cabo Verde*”. Authors: Catarina J Pinho, Bárbara Santos, Vanessa Mata, Mariana Pereira, Ricardo Jorge Lopes & Raquel Vasconcelos. See document No 2 listed in Appendix 2.
- Doctoral thesis by Ms Katelene da Cruz Delgado titled “A osga gigante de Cabo Verde : *Diferenças e semelhanças entre as duas subespécies de Tarentola gigas*”. See document No 3 listed in Appendix 2.
- Publication in the *Special Issue on Conservation Genetics and Genomics* of the scientific journal *Genes* (<https://www.mdpi.com/2073-4425/9/12/599>) of an article titled “What Is the Giant Wall Gecko having for Dinner? Conservation Genetics for Guiding Reserve Management in Cabo Verde”. See document No 4 listed in Appendix 2.
- Publication of an article titled “Intricate trophic links between threatened vertebrates confined to a small island in the Atlantic Ocean” in the journal *Ecology and Evolution*. See document No 5 listed in Appendix 2.

- Participation of Dr Raquel Vasconcelos in the *Third Conference on Island Ecology, Evolution and Conservation* (8–13 July 2019, La Réunion, France). Oral presentation titled “*Metabarcoding analysis of endemic lizards' diet for guiding reserve management in the Macaronesian Islands*”. Authors: Catarina Jesus Pinho; Vanessa Gil; Bárbara Santos; Vanessa A. Mata; Carlos Aguiar; Mariana Seguro; Carolina Jardim; Maria M. Romeiras; Rui Rebelo; Ricardo Jorge Lopes & Raquel Vasconcelos. See document No 6 listed in Appendix 2.

*Funded by Monaco Explorations:*

- *Travel and accommodation expenses for Raquel Vasconcelos and Aurélien Miralles in June 2017 (Monaco) then in Cabo Verde,*
- *Purchase of memory cards for the cameras,*
- *Publication of a booklet on the reptiles of Cabo Verde (see public engagement section),*
- *Recruitment, accommodation on Boa Vista and return travel to Mindelo for the fishermen guides,*
- *Rental of engine and purchase of oil and fuel for the boat used to travel to Boa Vista,*
- *Return travel of Kenny Delgado from Boa Vista to São Vicente,*
- *Purchase of expedition and bivouac equipment,*
- *Purchase of laboratory equipment for sample sequencing in Cabo Verde.*

#### 6.4 - Deployment of underwater camera units

With nearly ten islands and 700,000 km<sup>2</sup> of maritime area under its national jurisdiction, the archipelago of Cabo Verde is home to numerous rich underwater ecosystems. However, these ecosystems are not at all well known due to a lack of maritime resources and the distance of the sites.

The technique used here makes it possible to study seabed biodiversity at depths of less than 20 m.

It involves deploying submerged devices known as underwater camera units comprising Go Pro cameras in watertight cases mounted on tripods.

Installed in the study areas and operating in accordance with a strict protocol, the cameras record underwater images of wildlife (removing the bias caused by the presence of divers), making it possible to draw up an inventory of biodiversity (specific diversity, biomass) and study the behaviour of species.

This allows the presence of new species to be identified. Wildlife behaviour provides an indication of human impact (including impact due to fishing).

By using this procedure, it is possible to compare different sites and understand trends.



*The camera units deployed. © Rui Freitas. University of Cabo Verde*

The following took part in this operation: Mr Rui Freitas (University of Cabo Verde), Mr Pierre Frolla and Mr Frédéric Buyle (Monaco Explorations). The equipment was deployed twice at two different sites. These two tests allowed several images of underwater fauna to be captured at Branco and Sal Rei. They also enabled validation of the concept, which will subsequently be used routinely as part of a long-planned project by Mr Rui Freitas. The project can now be implemented thanks to financial support from Monaco Explorations.

*Funded by Monaco Explorations: purchase of video camera unit equipment.*

## 6.5 - Focus on sea turtles



*The beaches on the south-east of Boa Vista, where many loggerhead sea turtles lay their eggs.  
© P. Gilles. Monaco Explorations*

The Cabo Verde archipelago is the world's third most important reproduction site for the loggerhead sea turtle (*Caretta caretta*), particularly the beaches of Boa Vista, where around 65% of eggs in Cabo Verde are laid. Rapidly developing tourism and poaching, which is unfortunately still practised, are the main threats to these vulnerable populations.

According to the Fundação Tartaruga (Sea Turtle Foundation), following the introduction of monitoring, the amount of laying observed in 2017 reached a new record, which could indicate that the status of the populations has improved thanks to the work of those on the ground.



*An adult female loggerhead sea turtle lays her eggs at night on a Curral Velho beach in south-eastern Boa Vista. Young turtles are born during the night. Red light is the only type of light that does not disturb them. © P. Gilles. Monaco Explorations.*

Efforts to tackle poaching (surveillance of beaches), raise public awareness and involve local communities by turning local fishermen into nature guides who earn money from this new activity, are the keys to the protection and conservation of sea turtles in Cabo Verde.



The shell of a loggerhead sea turtle on the islet of Sal Rei off the coast of Boa Vista, suggesting an act of poaching.  
© P. Gilles. Monaco Explorations.

The Monaco Explorations sea turtle programme was prepared in partnership with the team from the Fundação Tartaruga, Dr Hiltrud Cordes, CEO of the Sea Turtle Foundation (Germany), Dr Christophe Eizaguirre (Queen Mary University of London), Fundação Tartaruga scientific supervisor, Ms Joana Nicolau and Mr Euclides Resende (Fundação Tartaruga, Boa Vista office), and Ms Sónia Araujo-Lopes, coordinator of the national sea turtle conservation programme.



The programme had a number of objectives:

- To support the Sea Turtle Foundation's sea turtle study programme by allowing it to purchase monitoring equipment;
- To support the work of non-governmental organisations and various stakeholders across the ten islands that make up the archipelago, supporting TAOLA, the national sea turtle protection network;
- Through the presence of H.S.H. the Sovereign Prince, to put the media spotlight on sea turtles in Cabo Verde, involving policymakers such as the Mayor of Boa Vista.

It comprised several different components:

- **Reconnaissance of various sites on Boa Vista from 16 to 19 Sovereign Prince** by Mr Pierre Gilles, Head of the Monaco Explorations Mission, and Mr Alain Binsinger, a palace security officer, in light of H.S.H. the Sovereign Prince's visit on 22 September. With assistance from the Fundação Tartaruga team, a meeting was organised with the local authorities, including the Director of the Port of Sal Rei, the Traffic Director, the Customs Director, the Head of the Maritime Police and Commander Duarte, Head of the Boa Vista Police. This was followed by a meeting on Curral Velho with scientists from the Sea Turtle Foundation, a visit to the nursery and a tour of the laying beaches.
- **Meeting of TAOLA network expert group, 21 September:** The stakeholders involved in sea turtle issues on Cabo Verde met at the head office of the Fundação Tartaruga in Sal Rei on 21 September, the day before H.S.H. the Sovereign Prince's visit. They put together a document setting out joint recommendations to improve the conservation status of sea turtles in Cabo Verde.

Some of the members were meeting for the first time, a development for which Monaco Explorations deserves credit.

The following took part in the meeting:

- Ms Sónia Araujo-Lopes, coordinator of the Cabo Verde national sea turtle conservation plan;
  - Dr Christophe Eizaguirre and Ms Emma Lockley, Queen Mary University of London,
  - Mr Euclides (Ukie) Resende and Ms Joana Nicolau, Fundação Tartaruga,
  - Ms Gilda Monteiro and Ms Silvana Roque, members of the Vito Santo Antao and Santa Luzia project;
  - Ms Sandra Correia, INDP-São Vicente;
  - Mr Nelson Lopes, Ponta do Pom youth association - São Vicente;
  - Mr Albert Taxonera, Sal Biodiversity;
  - Mr Pedro Lopes and Ms Carolina Oujo, BIOS - Boa Vista;
  - Mr Adilson (Leno) Dos Passos, Mr Rocio Moreno, FMB Maio;
  - Mr Joao Gomes Pina Lomba, Associação Ambiental Caretta Caretta - Santiago,
  - Mr Herculano Diniz, Projecto Vito Fogo, Mr Senior Cruz, Varandinia - Boa Vista.
- **Report to H.S.H. the Sovereign Prince, 22 September 2017:**  
On board the *Yersin*, the experts presented their report to H.S.H. the Sovereign Prince on the issue of sea turtles and the actions undertaken on Cabo Verde (current status, threats and solutions). Mr Robert Calcagno and Mr Pierre Gilles also participated in this session.





*Reporting on the issue of sea turtles in Cabo Verde to H.S.H. the Sovereign Prince.  
© P. Gilles. Monaco Explorations.*

- **Field visit by H.S.H. the Sovereign Prince to the Curral Velho site:**

Following the report session, the expert group, H.S.H. the Sovereign Prince and the Monaco Explorations delegation, joined by Mr José Luis Santos, the Mayor of Boa Vista, and a local delegation, visited the Fundação Tartaruga site in southern Boa Vista at Curral Velho to tour the non-governmental organisation camp, the sea turtle nursery and the egg-laying sites. Dr Lucy Hawkes (University of Exeter), Dr Christophe Eizaguirre, Ms Emma Lockley (PhD student) and Ms Joana Nicolau gave a presentation of their work and the operation of the site.

H.S.H. the Sovereign Prince, Mr José Luis Santos, Mayor of Boa Vista, and Ms Sónia Araujo-Lopes handed out educational booklets on protecting sea turtles to a group of children on a trip to the sea. The booklet was reissued thanks to support from Monaco Explorations. On his return to the *Yersin*, H.S.H. Prince Albert II invited Mr José Luis Santos, Mr Aristides and Mr Brito Alderman from Boa Vista Town Hall, Ms Ana Sapinho, Advisor, Ministry of Foreign Affairs and Communities, Dr Christophe Eizaguirre, Mr Adilson Dos Passos, FMB Maio, and Mr Pierre Gilles to join him for lunch. Colonel Bruno Philipponnat and Mr Robert Calcagno were also present.



*Dr Christophe Eizaguirre explains to H.S.H. Prince Albert II and Mr Robert Calcagno how the site operates.  
Each circle enclosed by a net corresponds to a sea turtle nest. © O. Borde. Monaco Explorations.*



*Group photo with the team from the Sea Turtle Foundation and experts from the TAOLA network. © O. Borde. Monaco Explorations*

The work carried out on sea turtles was the subject of several documents, which are listed in Appendix 2:

- Report produced by Dr Christophe Eizaguirre titled *“Diversity, ecology and threats of loggerhead turtles nesting in the Cabo Verde Archipelago”*. See document No 7 listed in Appendix 2.
- Summary of recommendations put forward by participants in the TAOLA network meeting, titled *“Advancing protection of the Cabo Verde loggerhead Turtle (Caretta caretta) - Recommendations - TAOLA Network”* - Meeting aboard the *Yersin*, Sal Rei, Boa Vista, 21 September 2017, produced by Dr Christophe Eizaguirre, Ms Joana Nicolau and Mr Euclides Resende. See document No 8 listed in Appendix 2.

*Funded by Monaco Explorations:*

- *Transport and accommodation for TAOLA network stakeholders and experts;*
- *Purchase of tags (2 Argos + 10 CEFAS);*
- *Reissue of 1,400 copies of the sea turtle education and awareness booklet and acquisition of rights to publish online.*

This first phase in Cabo Verde was continued through:

- *The sea turtle programme embarked upon by the Principality;*
- *The visit of Dr Cordes and Mr Resende to the Sea Turtle Rescue Centre at the Oceanographic Museum on 2 March 2018 (when the centre was nearing completion).*

## 6.6 - Megafauna study

The seamounts and shallows that characterise the waters of Cabo Verde are home to a rich variety of megafauna, particularly rays (including manta rays) and numerous sharks (whale sharks, tiger sharks). These fish, which have been little studied due to a lack of maritime resources, are heavily impacted by intensive fishing.



*A whale shark observed on the João Valente Bank to the south-west of Boa Vista. © MarAlliance.*

The work carried out in Cabo Verde by two separate teams, the team from non-governmental organisation MarAlliance and the team led by Pr Mouillot (University of Montpellier) sought to study this group using complementary techniques: satellite monitoring tags and baited remote underwater video cameras (BRUVs).



*The science team, Monaco Explorations and the crew of the Yersin together on the ship's aft deck. © O. Borde. Monaco Explorations.*

MarAlliance carries out research on sharks and manta rays on both sides of the Atlantic, in Cabo Verde and Belize. The organisation monitors the animals' migration using satellite surveillance and BRUV observations. One team is permanently based in Sal Rei on the small islands of Boa Vista.



*The MarAlliance team. From left to right: Mr Joao Lima, Dr Rachel Graham, Mr José (Zé) Monteiro, Ms Cintia Lima and Mr Alexander Seymour © P. Gilles. Monaco Explorations.*

The team was made up of Dr Rachel Graham (Founder and Executive Director of MarAlliance), Mr Alexander Seymour (MarAlliance National Coordinator for Cabo Verde, Mr José Luis Gomes Monteiro and Mr Joao Alberto Oliveira Lima (fisherman guides for MarAlliance), Ms Cintia Lima (Communications Manager for MarAlliance, Cabo Verde).

Pr Mouillot's team comprised Dr Tom Letessier (Post Doc, research fellow, Institute of Zoology, Zoological Society of London), Dr Jonathan Grondin-Leconte-Demarsy (Project Lead, Spygen, Le Bourget du Lac), Ms Virginie Marques (PhD student at the University of Montpellier –MARBEC) and Dr Clara Péron, Post Doc, research fellow, MARBEC Lab (Marine Biodiversity Exploitation and Conservation), University of Montpellier.



*Pr Mouillot's team. From left to right: Ms Virginie Marques, Ms Clara Péron, Dr Tom Letessier, Dr Jonathan Grondin-Leconte-Demarsy. © P. Gilles. Monaco Explorations.*

Pr Mouillot obtained validation from Monaco Explorations of a longitudinal programme which seeks to study megafauna using innovative techniques, environmental DNA and subsurface BRUVs, including this first phase in Cabo Verde.





*Dr Tom Letessier and Ms Virginie Marques, assisted by the Yersin crew, head out to sea to deploy the subsurface BRUVs. © P. Gilles. Monaco Explorations.*

The activities took place over five full days at several sites off the coast of Boa Vista and João Valente Bank.

#### **Outcomes of MarAlliance's work:**

- On 25 September, off the coast of Sal Rei on board the small fishing boat *Stéphanie*, operating at its own risk, the team installed two Spot 6 tags on manta rays (*Manta birostris*);
- On 28 September, near João Valente Bank, a bignose shark (*Carcharhinus altimus*) measuring 2.5 m and a tiger shark (*Galeocerdo cuvier*) measuring 3.5 m were captured. The bignose shark was fitted with a Rototag plastic tag. The tiger shark was measured and photographed. A tissue sample was taken to enable DNA analysis and add to the reference data bank for megafauna in the area. A sample was also taken from the surface of the dorsal fin to study the bacterial flora (study carried out by Clara Péron). A conventional Rototag bearing a simple number and a Spot 6 tag were attached to the dorsal fin. The Spot 6 tag was designed to give scientists information on the animal's position (Argos system) and water temperature, with the aim of understanding the animal's movement and studying its possible migration to other areas of the Atlantic;
- On 29 September, on João Valente Bank, the MarAlliance team fitted a tag to a female whale shark (*Rhincodon typus*) measuring 5 m, which will subsequently be tagged, filmed and photographed.





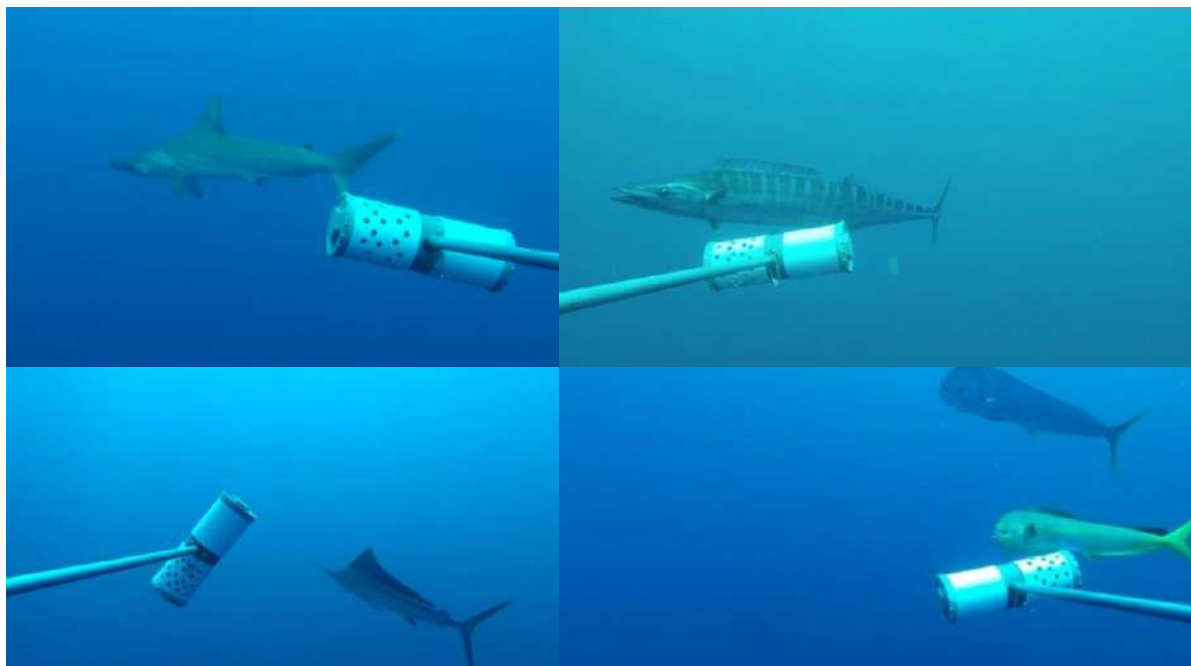
*A monitoring tag is fitted to the dorsal fin of a female tiger shark to the south of Boa Vista. © MarAlliance.*



*The MarAlliance team deploys a BRUV to the seabed. © MarAlliance.*

#### **Outcomes of the work carried out by Pr Mouillot's team:**

During the five operational days, the team was able to deploy the subsurface BRUV system multiple times in often difficult seas (6 cameras on chassis connected to surface buoys, spaced 200 m apart, covering a total of 1,200 m). The video that was recorded confirmed the presence of open sea predators, great hammerhead sharks, dolphinfish and wahoo, but they were inconspicuous and seen only in small numbers.



*Great hammerhead shark, wahoo, marlin, dolphinfish: numerous species came close to the BRUVs deployed underwater. © T. Letessier. MARBEC.*

The work carried out by MarAlliance and Pr Mouillot's team were the subject of two reports. See documents No 9 and 10 listed in Appendix 2.

*Funded by Monaco Explorations:*

- *Support for MarAlliance's purchase of 20 satellite monitoring tags;*
- *Recruitment of dive director Mr Maxime Gardien who, in addition to supervising diving operations (mainly freediving) provided PADI Freediver training (theory, practical, official certificate) to teams without the required skill level. Rachel Graham, Alexander Seymour, José Luis Gomes Monteiro, Joao Alberto Oliveira Lima, Pierre Gilles, Tom Letessier, Clara Péron passed the training; José Luis Gomes Monteiro did not.*
- *Pr Mouillot's team worked within the framework of the longitudinal programme funded by Monaco Explorations.*

## 7 - Public engagement activities

The key goals of the public engagement programme and activities were:

- To promote to a wide audience Monaco Explorations and the work carried out by local and international teams of scientists;
- To raise awareness of the need to protect and sustainably manage the oceans;
- To offer a broad and sensitive overview of the major challenges involved in ocean conservation today, as well as existing solutions, through the experience and first-hand accounts of mission participants;
- To encourage personal and collective engagement with the aim of having a positive impact on the oceans.

## 7.1 - Live from Cabo Verde: strong engagement with the educational community

On 21 September 2017, H.S.H. the Sovereign Prince, accompanied by Mr Robert Calcagno, chatted live from the videoconference room at the Ocean Science Centre Mindelo with 267 primary and secondary school pupils and their teachers, who dialed in from the Conference Hall at the Oceanographic Museum in Monaco.

This live session reflected the determination of Monaco Explorations, and the Oceanographic Institute in particular, to give school audiences wide access to the mission content, in partnership with the Monaco Department of Education, the International School of Monaco, the French Education Ministry, and any other educational organisation. A three-year programme developed by Monaco's Department of Education for primary and secondary levels and educational workshops were also designed and tested as part of this work with schools.



H.S.H. Prince Albert II of Monaco, accompanied by Mr Robert Calcagno, talk directly from Mindelo to 267 pupils and teachers in the Principality. © M. Dagnino. Monaco Explorations.

## 7.2 - Publication of a booklet on the herpetofauna of Cabo Verde

The programme of activities carried out in Cabo Verde included the publication of a two-page booklet on herpetofauna, titled *“Répteis terrestres das Desertas - Ilha de Santa Luzia e ilhéus Branco e Raso”*. The booklet was put together by Dr Raquel Vasconcelos. With support from Monaco Explorations, 2,000 copies of the booklet were printed and given to local non-governmental organisations for dissemination. The aim was to raise public awareness regarding these native, vulnerable and endangered species. See Document No 11 listed in Appendix 2.



Booklet on the herpetofauna of Cabo Verde, produced by Dr Raquel Vasconcelos. Publication was funded by Monaco Explorations.

### 7.3 - 360° VR film: “The mystery of the giant lizard”

Numerous 360° images were shot on the islet of Branco and during the course of the mission by Mr Fabrice Schnoller and Mr Fred Buyle.

These served as the basis for VR 360° short films. The ten-minute film produced on the Cabo Verde mission is titled “The mystery of the giant lizard” and shows the herpetology activities carried out in the field. The film has been shown to visitors at the Oceanographic Museum in Monaco and to school groups, as part of the work of the Museum’s Events and Education Department. It is available in French and English to any organisation that would like to use it for educational and awareness purposes. VR headsets were purchased for use during the missions and so that locally filmed images could be shown to those involved and to young people.



*An image from the 360° film about Monaco Explorations which can be watched by visitors to the Oceanographic Museum of Monaco. © Oceanographic Museum of Monaco.*

*Funded by Monaco Explorations: the purchase of viewing equipment, filming and production of VR short films.*

### 7.4 - Reissue of an educational booklet on sea turtles

Monaco Explorations provided financial support to reissue and disseminate an environmental education booklet about sea turtles, titled “*A viagem da visitante mais antiga de Cabo Verde (The journey of Cabo Verde’s oldest visitor)*”. With kind permission from the Programa Tatô (sea turtle conservation and sustainable management of marine and coastal natural resources in Portugal and São-Tomé), the Association for Sea Turtles (ATM) – Tartarugas A Salvo, the Maio Biodiversity Foundation and Queen Mary University of London, 1,400 copies of the education and awareness booklet were published for schoolchildren and the younger generations in Cabo Verde.

Authors – Booklet texts: Ms Sara Viera. Illustrations: Mr Victor Jimenez. See document No 12 listed in Appendix 2.

Monaco Explorations also acquired the rights to publish the booklet online to increase its value further.





Front page of the awareness booklet about sea turtles, titled “A viagem da visitante mais antiga de Cabo Verde (The journey of Cabo Verde’s oldest visitor)”. © P. Gilles. Monaco Explorations.

## 7.5 - 2017 and 2018 highlights

### Lecture in Mindelo

Dr Raquel Vasconcelos and Dr Aurélien Miralles gave a lecture about the mission and the work conducted on Cabo Verde’s herpetofauna at the University of Mindelo on 26 September 2017. The lecture was titled “*What is the giant wall gecko of Cabo Verde having for dinner?*”, and was covered by national television.

### The Prince and the Sea

In addition to the conference announcing Monaco Explorations on 4 April 2017, the Oceanographic Museum hosted several other highlights in 2017 and 2018, including on the evening of 5 December 2017 when there was a preview screening of Ms Christine Oberdorff’s report for Ushuaia TV/TF1, titled “*The Prince and the Sea*”, following the Sovereign’s trip to Madeira and Cabo Verde, and the launch of the photography exhibition “*Monaco Explorations: Return to Macaronesia*”.



“The Return to Macaronesia – Madeira and Cabo Verde” exhibition is presented to the Sovereign by Mr Robert Calcagno and Mr Pierre Gilles. © M. Dagnino. Oceanographic Institute.



*Group photo of those who contributed to the first two Monaco Explorations missions in Madeira and Cabo Verde, taken during the evening event on 5 December 2017 at the Oceanographic Museum.  
© M. Dagnino. Monaco Explorations.*

### **Working visit of the President of the Republic of Cabo Verde to Monaco on 11 April 2018**

On the morning of Wednesday 11 April, H.S.H. Prince Albert II welcomed H.E. Mr Jorge Carlos De Almeida Fonseca, President of Cabo Verde, to the Prince's Palace for the 2<sup>nd</sup> "Monaco Ocean Week".

During the visit, the Sovereign Prince and Mr De Almeida Fonseca discussed relations between their two countries and then went together to the 13<sup>th</sup> Salon Ever (an exhibition on renewable energy and eco-friendly vehicles) at the Grimaldi Forum.



*Mr Jorge Carlos De Almeida Fonseca, President of Cabo Verde, is welcomed to the Oceanographic Museum of Monaco. On his right is Mr Robert Calcagno, CEO of the Oceanographic Institute; on his left, Mr José Gonçalves, Minister of Tourism and Transport and Minister of Maritime Economy, and Mr Luis Filipe Tavares, Minister of Foreign Affairs and Communities and Minister of Defence. © M. Dagnino. Monaco Explorations.*

Mr Jorge Carlos De Almeida Fonseca along with Mr João Silva, Military Commander, Mr Luís Filipe Tavares, Minister of Foreign Affairs and Communities and Minister of Defence, Mr José Gonçalves, Minister of Tourism and Transport and Minister of Maritime Economy, Ms Clara Delgado Jesus, Diplomatic Advisor to

the President, Ms Helga Santos Santiago, Director of Protocol to the President and several members of the technical delegation were welcomed to the Oceanographic Museum of Monaco by Mr Robert Calcagno, the CEO, and his teams for a tour of the museum, a report on the work carried out in the Cabo Verde archipelago and a historical overview of Prince Albert I's visit to Cabo Verde in 1901. They were also able to discuss potential collaboration, and copies of the booklets on sea turtles and on the herpetofauna of Cabo Verde were presented to President Fonseca.

In the afternoon, H.S.H. Prince Albert II and H.E. Mr Jorge Carlos De Almeida Fonseca attended, at the Oceanographic Museum, a screening of the Monaco Explorations' film on the "Cabo Verde mission", in which H.S.H. the Sovereign Prince participated in October 2017, and a report on the work carried out during the Transatlantic Sargasso mission (French West Indies). They then toured the photography exhibition devoted to the Cabo Verde and Sargasso missions in the Museum's Conference Hall.

Pr Dr Peter Herzig and Dr Björn Fiedler of the GEOMAR Helmholtz Centre for Ocean Research, Kiel were also in attendance.



H.S.H. Prince Albert II shows the President of Cabo Verde, Mr Jorge Carlos De Almeida Fonseca, the exhibition devoted to the Monaco Explorations' Cabo Verde and Transatlantic Sargasso missions, accompanied by Mr Robert Calcagno and Pr Dr Peter Herzig, CEO of the GEOMAR Helmholtz Centre for Ocean Research, Kiel.  
© M. Dagnino. Oceanographic Institute.

Subsequently, a framework cooperation agreement intended to strengthen relations between Cabo Verde and Monaco was signed in the presence of the two heads of state. The working visit concluded with a dinner hosted by H.S.H. Prince Albert II at the Prince's Palace.

### **Photography exhibition – *Monaco Explorations: Return to Macaronesia***

The first missions to Madeira and Cabo Verde were the subject of a photography exhibition titled "*Monaco Explorations: Return to Macaronesia*" in the Conference Hall at the Oceanographic Museum from 5 December 2017 to mid-February 2018. The exhibition was opened at the preview screening of the documentary.

The exhibition then moved to the Galerie des Pêcheurs in Monaco, where it was on display from early June to mid-July 2018. The "Transatlantic Sargasso" mission was the subject of a photography exhibition from 11 April (visit of the President of Cabo Verde) to 7 May 2018. One section of the new exhibition *Monaco and the Ocean*, officially opened at the Oceanographic Museum of Monaco in July 2018, presents Monaco Explorations, offering visitors information on the work carried out during the Macaronesia mission to Madeira, the Savage Islands and Cabo Verde.



*The section of the Monaco and the Ocean exhibition presenting Monaco Explorations and the work carried out during the mission to Cabo Verde. © M. Dagnino. Oceanographic Institute.*



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Monaco Explorations would like to thank all those who made this mission to Cabo Verde possible.

**H.S.H. Prince Albert II of Monaco**

**The Prince's Government of Monaco** and particularly the Ministry of Foreign Affairs and Cooperation

**Republic of Cabo Verde**

**Dr Jorge Carlos Fonseca**, President of the Republic of Cabo Verde,

**Mr Gilberto Correia Carvalho Silva**, Minister of Agriculture and the Environment,

**Mr José da Silva Gonçalves**, Minister of the Economy and Employment,

**H.E. Mr Jose-Luis Fiahlo Rocha**, Permanent Representative to the United Nations,

**Mr Carlos Ferreira Santos**, Germany's Honorary Consul in the Republic of Cabo Verde,

**Ms Jeanne Brito Salhab**, Embassy of the Republic of Cabo Verde in France,

**Ms Ana Sapinho Pires**, Ministry of Foreign Affairs,

**Ms Sónia Araujo-Lopes, Ms Silvana Monteiro Roque**, Ministry of Agriculture and the Environment,

**The authorities and the Navy of the Republic of Cabo Verde,**

**Cdr Duarte**, Boa Vista Chief of Police,

**Mr José Lima Santos, ENAPOR**, Director of the Port of Sal Rei,

**Mr José Luis Santos, Mr Aristides, Mr Brito**, Boa Vista Town Hall,

**Pr Astrigilda Silveira**, Vice-Rector, University of Cabo Verde,

**Dr António Carlos Varela**, President, Faculdade de Engenharia & Ciências do Mar, Universidade de Cabo Verde,

**Mr Rui Freitas, Ms Jessica Cibelle Fonseca de Matos, Ms Corrine Almeida**, University of Cabo Verde,

**Dr Osvaldina Silva and Mr Nuno Vieira**, Instituto Nacional de Desenvolvimento das Pescas,

**Pr Dr Peter Herzig, Ms Cordula Zenk, Dr Björn Fiedler**, GEOMAR Helmholtz Centre for Ocean Research, Kiel, Germany,

**Ms Luciana Génio**, University of Aveiro, Portugal

**Pr Manuel Biscoito**, Curator of the Funchal Natural History Museum, and his wife **Ms Maria "Zé" Biscoito**,

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**Dr Maria M. Romeiras**, University of Lisbon

**Ms Katelene da Cruz Delgado**, University of Cabo Verde,

**Mr Kenny Delgado**, Biosfera-I, Mindelo,

**Mr Augusto da Cruz, Mr Daniel Cruz**, fishermen and local guides, Salamansa,

**Dr Christophe Eizaguirre, Ms Emma Lockley**, Queen Mary University of London,

**Dr Lucy Hawkes**, University of Exeter

**Dr Hiltrud Cordes, Mr Euclides Resende, Ms Joana Nicolau, Mr Senior Cruz**, Fundação Tartaruga / Turtle Foundation

**Ms Gilda Monteiro, Ms Silvana Roque**, Vito Santo Antao and Santa Luzia project, **Ms Sandra Correia**, INDP, **Mr Nelson Lopes**, Ponta do Pom youth association, **Mr Albert Taxonera**, Sal Biodiversity, **Mr Pedro Lopes**, BIOS-CV, **Ms Carolina Oujo**, BIOS, **Mr Adilson (Leno) Dos Passos** and **Mr Rocio Moreno**, FMB Maio, **Mr Joao Gomes Pina Lomba**, Associação Ambiental Caretta Caretta Santiago, **Mr Herculano Diniz**, Vito Fogo project, **Mr Senior Cruz**, Varandinha.

**Ms Betânia Ferreira Airaud**, Director & Co-founder, Programa Tatô, Portugal

**Dr Rachel T. Graham, Mr Alexander Seymour, Mr José Monteiro, Mr Joao Lima, Ms Cintia Lima**, MarAlliance, Boa Vista

**Pr David Mouillot, Dr Clara Péron, Ms Virginie Marques**, University of Montpellier

**Dr Tom Letessier**, Zoological Society of London,

**Mr Jonathan Grondin-Leconte-Demarsy**, Spygen, France,

**Mr Maxime Gardien**, dive director,

**Dr Ana Brito**, emergency care doctor,

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**Mr Thomas Fouilleron**, Director of the Prince's Palace Archives and Library, Monaco,

**Mr Thomas Blanchy**, Administrator at the Prince's Palace Archives and Library, Monaco,

**Ms Jacqueline Carpine-Lancré**, Head of Historical Research at the Prince's Palace, Monaco,

**Mr Vincent Vatrican**, Director of the Audiovisual Archives of Monaco,

**H.E. Mr Bernard Fautrier**, CEO and Vice President of the Prince Albert II of Monaco Foundation,

**Dr Philippe Mondielli**, Scientific Director of the Prince Albert II of Monaco Foundation,

**Ms Auriane Pertuisot**, Head of Maritime Projects, Prince Albert II of Monaco Foundation,

**Lieutenant-Colonel Philippe Rebaudengo**, Aide de camp to H.S.H. the Sovereign Prince, Dive Director

**Pr Yann-Erick Claessens, Dr Olivia Keita-Perse**, Princess Grace Hospital, Monaco,

**Dr Philippe Afriat**, Monaco,

**Dr Sylvie Dehours**, Maritime Medical Advisory Centre, Toulouse, France,

**Mr Patrice Cellario**, Minister of the Interior, Monaco,

**Ms Isabelle Bonnal**, Director of Education, Youth and Sport, Monaco, **Ms Armelle Borro**, Manager of the Teacher Training Centre, **Ms Cécile Mouly**, National Education, Monaco,

**Ms Marie-Catherine Caruso-Ravera**, Director of Diplomatic and Consular Relations, Monaco,

**Ms Dominique Simon**, assistant to Colonel Bruno Philipponnat,

**Mr Alain Binsinger, Mr James Arslan**,

**Mr Francis Gianni and Ms Habiba Taouche**, International School of Monaco,

**Ms Christine Oberdorff, Mr Mathieu Massuard, Mr Sébastien Decaux, Mr Arnaud Mouillevois**, Ushuaïa TV,

**Ms Emilie Rousseau, Mr Sylvain Peroumal**, Monaco Info

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as an essential and effective link with local stakeholders.

Thanks to **Ms Sónia Araujo-Lopes** from the Cabo Verde Ministry of Agriculture and the Environment, who was an observer on board the *Yersin* throughout the mission, for preparing and securing permits, and for her sound advice on a daily basis.



*Thanks to Mr Augusto da Cruz and Mr Daniel Cruz, fishermen and local guides, Salamansa, São Vicente © P. Gilles. Monaco Explorations.*

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**Mr Patrick Piguet**, Director of Heritage and his team: **Ms Anne-Marie Damiano**, Exhibitions Department, **Ms Michèle Bruni**, Head of the Scientific Collections of the Oceanographic Museum of Monaco, **Ms Valérie Pisani**, Head of Artistic Collections, **Ms Elisabeth Baltzinger**, Head of the Archives, **Ms Claire Harquet**, graphic designer,  
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GEOMAR Helmholtz Centre for Ocean Research, Kiel, Germany  
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Turtle Foundation, Cologne, Germany & Boa Vista, Republic of Cabo Verde  
MarAlliance, San Pedro, Belize & Boa Vista, Republic of Cabo Verde  
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### **The Monaco Explorations staff who were involved in organising, planning and running the Cabo Verde mission:**

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**Mr Thierry Apparü**, **Ms Liz Factor**, **Mr Fabrice Schnöller**, **Mr Fred Buyle** and **Mr Olivier Borde** for the photography,  
**Mr Pierre Frolla**, Monaco Explorations Dive Director,  
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## Appendix 2 - List of reports and publications by the mission scientific teams

Reports and summaries can be obtained by contacting the authors or submitting a request to Monaco

Explorations: [contact@monacoexplorations.org](mailto:contact@monacoexplorations.org)

- 1) ***What can we learn from the parasitic nematode fauna of the Extinct giant skink of Cabo Verde?*** Poster presented at the *Herpetologia Iberica* Congress, Salamanca, Spain, 5–8 September 2018. Vicente Roca, Amanda de Sousa, Aurélien Miralles, Anna Perera & Raquel Vasconcelos.
- 2) ***O que janta a osga gigante de Cabo Verde? Genética da Conservação para guiar a gestão de reservas em Cabo Verde***, Catarina J Pinho, Bárbara Santos, Vanessa Mata, Mariana Pereira, Ricardo Jorge Lopes & Raquel Vasconcelos. Oral presentation. *Herpetologia Iberica* Congress, Salamanca, Spain, 5–8 September 2018.
- 3) ***A osga gigante de Cabo Verde: Diferenças e semelhanças entre as duas subespécies de Tarentola gigas. Relatório de estágio do curso de Licenciatura em Ciências Biológicas***. -Katelene da Cruz Delgado (Graduation thesis).
- 4) ***What Is the Giant Wall Gecko having for Dinner? Conservation Genetics for Guiding Reserve Management in Cabo Verde***, Special Issue on Conservation Genetics and Genomics of the scientific journal *Genes*, <https://www.mdpi.com/2073-4425/9/12/599>.
- 5) ***Intricate trophic links between threatened vertebrates confined to a small island in the Atlantic Ocean***. Lopes R, Pinho CJ, Santos B, Seguro M, Mata VA, Egeter B, Vasconcelos R (in press). *Ecology and Evolution*.
- 6) ***Metabarcoding analysis of endemic lizards' diet for guiding reserve management in the Macaronesian Islands***. Oral presentation currently being prepared, preview at the Third Conference on Island Ecology, Evolution and Conservation, 8–13 July 2019, La Réunion, France.
- 7) ***Diversity, ecology and threats of loggerhead turtles nesting in the Cabo Verde Archipelago***. Dr Christophe Eizaguirre.
- 8) ***Advancing protection of the Cabo Verde loggerhead Turtle *Caretta caretta* - Recommendations - TAOLA Network*** - Meeting aboard *Yersin*, Sal Rei, Boa Vista, 21 September 2017, Dr Christophe Eizaguirre, Ms Joana Nicolau and Mr Euclides Resende.
- 9) ***Pelagic fish assemblages in Cabo Verde as sampled by mid-water Baited remote Underwater Video Systems***, Tom B. Letessier, Clara Peron, Virginie Marques, Jonathan Grondin, David Mouillot.
- 10) ***Cabo Verde Expedition, 25 September–1 October 2017, Boa Vista, Cabo Verde and João Valente reef***, MarAlliance Team, Dr Rachel Graham, Zeddy Seymour, José Luis Monteiro, Cintia Lima and Joao Lima.
- 11) ***Répteis terrestres das Desertas - Ilha de Santa Luzi e ilhéus Branco e Raso - Booklet on the herpetofauna of Cabo Verde*** (2 pages) - Dr Raquel Vasconcelos
- 12) ***A viagem da visitante mais antiga de Cabo Verde***. Environmental education booklet on sea turtles in Cabo Verde.





## **MONACO EXPLORATIONS**

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