Report on a trip to the Selvagens on board the M/V YERSIN during the *Explorations de Monaco* Expedition to Macaronesia 2017

9-11 September 2017

Team: Francis Zino Elizabeth Zino Conceição Ornelas Manuel Biscoito









M U S E U HISTÓRIA NATURAL FUNCHAL

Background

The Selvagens Islands are a small group of islands belonging to Portugal and are located in the eastern Atlantic, 160 miles south of Madeira and 80 miles north of Tenerife. They comprise 3 islands, Selvagem Grande, Selvagem Pequena and Ilhéu de Fora and several small islets (Figs. 1 and 2).



Figure 1. The Selvagens Islands



Figure 2. Selvagens seen from space. Selvagem Grande (left) and Selvagem Pequena and Ilhéu de Fora (right).

The islands were officially discovered by the Portuguese navigator Diogo Gomes in the mid 15th century, although they were known as earlier as 1345. Ever since its discovery, the islands have been privately owned until 1971, when the Portuguese government bought them and made them a Nature Reserve.

Although there were some colonization attempts, the islands have been most of the time uninhabited, until the 1980's when park wardens were stationed permanently on Selvagem Grande.

The main source of income of the owners was the culling rights of Cory's Shearwaters, fish, limpets and periwinkles and the collection of a lichen, *Rocella tinctoria*, then used to extract purple dye. Over the years, goats, rabbits and mice were introduced in Selvagem Grande, but are now eradicated. The other islands of the group have never been colonized by introduced herbivores.

Although visited by many naturalists and explorers, starting by Captain James Cook in 1768 and including Prince Albert I of Monaco in 1904 and 1911, the islands have never been systematically studied until 1963, when the Funchal Natural History Museum (MMF) organized the first multidisciplinary scientific expedition to the Selvagens. Since this event, the islands have been thoroughly studied, with particular emphasis on sea birds, a work started by the French ornithologists Francis Roux and Christian Jouanin, of the Paris Museum, closely accompanied by Paul Alexander Zino, whose interest on the islands' nature started in 1963 and made him to build a house in 1967, a crucial step for the support of the visiting scientists and for the protection of the islands, even before they were declared a nature reserve. In fact, Alec Zino not only became interested on the breeding birds of the islands, therefore turning him into an authority on seabirds, but also supported conservation actions before the Portuguese and Madeiran governments assumed their responsibilities on this matter. Without his interest and dedication, the Selvagens would not have been what they are now, one of the most precious nature reserves in the Atlantic.

The Selvagens are of oceanic volcanic origin and are a result of the activity of the Canaries hotspot, ca. 27 millions years ago.

The most striking biological feature of these islands are the colonies of Procellariiform birds, in particular Cory's Shearwaters, *Calonectris borealis* (over 30.000 pairs) and White-faced Frigate Petrels, *Pelagodroma marina hypoleuca* (over 40.000 pairs), the latter having in the Selvagens the largest and northernmost colony in the world. Three other species also breed in the Selvagens (by decreasing order of abundance): Bulwer's Petrel, *Bulweria bulwerii*, Madeira Storm Petrel, *Oceanodroma castro* and Barolo's Petrel, *Puffinus baroli*. Swinhoe's Petrel, *Oceanodroma monorhis* have been regularly seen in Selvagens and may be breeding there too.

The islands also have two endemic reptile taxa, the gecko, *Tarentola bischoffi* and the lizard, *Teira dugesii selvagensis*, 201 arthropod taxa, 44 of which endemic and at least 8 terrestrial mollusc taxa, one of which endemic.



Figure 2. General views of the Selvagens. A, C & D, Selvagem Pequena. B, E, F, G & H, Selvagem Grande.

Apart from the animals, the islands possess a highly interesting flora, extraordinary well preserved on Selvagem Pequena and Ilhéu de Fora, which have never by subject to grazing by introduced herbivores. In total, 105 plant species have been recorded, 7 of which are endemic to the Selvagens. It is remarkable the presence on Ilhéu de Fora of an endemic plant species, *Euphorbia anachoreta*, on which an endemic beetle, *Deucalion oceanicus*, live.

At marine level, Selvagens present a unique seascape, with highly transparent waters, populated by more than 80 coastal fish species, 200 algae, 200 molluscs, over 100 crustaceans, etc. Ten cetacean species and 5 turtle species have also been recorded from their waters.

In all, the Selvagens are a unique archipelago with no other term of comparison on the world's subtropical belt.

Objectives

The present visit had the following objectives:

- To record the condition of the flora of the islands;
- To observe the presence of birds other than breeding seabirds;
- To collect stomachs of dead seabirds for micro-plastics search;
- To ring juveniles of Cory's Shearwaters at Selvagem Grande;
- To record marine litter on the littoral of Selvagem Pequena.

Results

Due to unfavourable weather conditions it was not possible to visit Ilhéu de Fora. Therefore we visited Selvagem Pequena on the afternoon of the 9th and the whole day on the 10th and Selvagem Grande on the night of the 10th and the day of the 11th, until 16:30.

Flora

The time of the year was not ideal for plants, but still several species of plants were seen, some of them in flower, such as *Asparagus nesiotes*, *Frankenia laevis*, *Lotus glaucus* and *Lobularia canariensis* var. *rosula-venti* at Selvagem Pequena and *Schizogyne sericea* and *Mesembrianthemum nodiflorum* at Selvagem Grande (Figs. 3 & 4).

Birds (non Procellariiformes)

A few seagulls, *Larus michahellis*, were seen at Selvagem Grande and at least two nests of this species were seen in Selvagem Pequena (Fig. 5-F). Interesting to note that these nests were full of bones and feathers of White-faced Frigate Petrel, thus proving that seagulls are important predators of this species and an eventual increase in its population may pose a serious threat.

Several Berthelot's Pipits, *Anthus berthelotii berthelotii*, were seen on both islands.



Figure 3. Some plants observed on Selvagem Pequena. A – *Zygophilum fontanesii*; B – *Lotus glaucus*; C – *Lobularia canariensis* subsp. *rosula-venti*; D – *Limonium papillatum*; E – *Patellifolia procumbens*; F – *Asparagus nesiotes* subsp. *nesiotes*.



Figure 4. Some plants observed on Selvagem Grande. A – *Schizogyne sericea*; B & C – *Mesembryanthemum nodiflorum*; D – from left: *Patellifolia patellaris, Senecio incrassatus* and *Suaeda vera*; E – *Solanum lycopersicum*; F – *Rocella tinctoria* (lichen).

Collection of stomachs from dead birds

In order to continue the monitoring of micro-plastics in the stomachs of seabirds, two corpses of Cory's Shearwaters and one of White-faced Frigate Petrel were dissected and the stomachs collected and preserved for future analysis at the Funchal Natural History Museum (Fig. 5 - G & H).



Figure 5. Bird observations on Selvagens. A, B, C & D – Cory's Shearwater, Calonectris borealis; E – Ringing of juvenile Cory's Shearwater; F – Nest of seagull with remnants of White-faced Frigate Petrel; G & H – Dissection of Cory's Shearwater corpses for extraction of stomachs for micro-plastics detection.

Ringing juveniles of Cory's Shearwaters at Selvagem Grande

Due to the little time available on land, only fifty juvenile Cory's Shearwaters were ringed and weighed on nest at a study quadrat, below Pico da Atalaia, on Selvagem Grande (Fig. 5-E & 6). This quadrat and another on Baía das Pedreiras have been monitored since 1967 by P. A. Zino and F. Zino. All nests are numbered and every year egg laying, hatching and fledging of shearwaters are controlled, making this the longest series of data on this species ever recorded. Total ringing on these quadrats will be achieved next October, on another visit by F. Zino.

Record of marine litter on the littoral of Selvagem Pequena.

Due to currents, two seashores of Selvagem Pequena (NE and NW bays) (Fig. 7) tend to accumulate marine litter in large quantities. The accumulated debris have been collected, from time to time, by the park wardens.

During this visit we were able to record a large amount of debris stranded ashore (Figs. 8 & 9). The vast majority of debris were plastic items, including trays, fishing gear, cans, jar and bottle cups and empty PET water bottles. As per the origin of these debris, a large quantity seems to have originated from boats, either fishing or merchant. Yachts may also be a source of marine litter found at Selvagem Pequena.

An empty gas cylinder from the Portuguese company GALP found at the NE bay (Fig. 8), may have originated from Madeira, eventually due to the 20th of February 2010 flood.

Amongst the debris, several empty shells of *Mytilus* sp. were found and collected for the MMF. Since mussels are not native of these waters, these specimens may have arrived attached to floating objects, proving that marine litter can be a mean of introduction of non-indigenous species.

All observations made relate to large plastic items. Micro-plastics in the environment were not sampled.

On the NE bay, an old oil spill was observed, with large portions of tar still attached to the rocks (Fig. 9).



Figure 6. Selvagem Grande, showing the location of the quadrat where juvenile Cory's Shearwaters were ringed (green rectangle) and the houses at Baía das Cagarras (red star).



Figure 7. Selvagem Pequena, showing the two seashores where marine litter accumulates (red band) and the location of the wardens' shed, at the landing point.



Figure 7. Marine litter at Selvagem Pequena. Top left, NW bay, where there is the wreck of the Norwegian tanker *Cerno*. All other photos from the NE bay.



Figure 8. Marine litter found at NE bay of Selvagem Pequena. Gas cylinders (top). The one at left may have come from Madeira, while the one at right is a common model on sailing yachts. Vestiges of an old oil spill (two photos at bottom).

Remarks

Our stay on the islands was very well cared by the crew of YERSIN, who provided confortable tender transportation and food and beverage in generous amounts. However, the ship's tenders (Zodiac Hurricane) proved not to be adequate for landing on rocky shores and shallow beaches, as it is the case of the Selvagens. If there weren't the help of N.R.P. Douro's dinghy to make the final approach to the Selvagem Pequena, it wouldn't have been possible to land, with YERSIN's tenders. The same happened on Selvagem Grande. This time the help came from the Autoridade Marítima Nacional (Maritime Police), who used his dinghy for the final approach to the landing place.

It is therefore of utmost importance that YERSIN be equipped with a flat bottom inflatable zodiac, for 6-7 passengers and equipped with a light 20Hp outboard engine, in order to allow landings on remote islands. According to own experience, this dinghy should have an extra protection at bow and aluminium/steel floor panels (more resistant than wood ones).

Acknowledgements

The team is indebted to *Explorations de Monaco* for having made possible this visit. Thanks are due to **Pierre Gilles**, Chief-Scientist on board the YERSIN, for all his insurmountable support and good will to accommodate our needs and to Captain **Jean Dumarais** and all crewmembers of YERSIN for their help during landing operations and for having proportionate an exceedingly pleasant stay on board. The team wishes also to thank **Carolina Santos**, and the wardens **Sandro** and **Pedro**, of IFCN, for the warm reception on the islands and invaluable help during the work. Thanks also to: the Commanding Officer and crew of N.R.P DOURO, for help on landings at Selvagem Pequena and for the transportation of FZ and EZ to Funchal; the staff from Autoridade Marítima Nacional for help on landings on Selvagem Grande.

MB and CO are particularly indebted to **Robert Calcagno**, Director-General of the Institut Océanographique, for the kind invitation to embark on the YERSIN to Cabo Verde and therefore for a unique and unforgettable experience.