

FIBS interview

Will you please introduce yourself ?

(Filippo) Hi, I'm Filippo Galimberti, of the Elephant Seal Research Group of Milano, Italy.

(Simona) Hi, I'm Simona Sanvito, also a member of the Elephant Seal Research Group. At the moment I'm in the last year of my PhD programme at Memorial University of Newfoundland, in Canada.

What is the Elephant Seal Research Group ?

(F) The ESRG is a small independent research organization dedicated to the study of elephant seals. We currently run two different research projects, one at Sea Lion Island, where we study the southern elephant seals, and one in the San Benitos Island, Baja California, Mexico, where we studied the northern elephant seals. The two species of elephant seals are in general quite similar in size, shape, and behaviour, but differ in a lot of details, which makes very the comparison between them.

Why have you decided to study the elephant seals ?

(F) Good question. Elephant seals are amazing animals. They deep dive up to 1500 meters, they completely fast for up to three months while on land for breeding and moulting, they are the most sexually dimorphic of all mammals. In a few words...if you like superlatives you will love these animals. We were looking for a species that can be easily marked for individual recognition and observed, and elephant seals are an ideal subject for that.

Tell us a bit more about the elephant seal life style

(F) Elephant seals are marine mammals, but they spend the most crucial part of their lifecycle on land. Every year they come to land to give birth and mate. They are as much solitary at sea as they are social while on land. At Sea Lion Island, around the end of August the biggest and oldest males haul out on the sandy beaches. Pregnant females start reaching their breeding grounds in early September, gathering in big groups, that we call harems, where they give birth, suckle the pup for about three weeks, and then mate before returning to sea. They usually give birth to a single pup and twins are rare. Males are very busy at this time, they try use displays, vocalizations and fights to define dominance relationships, and the highest ranking males get control of the biggest harems. After the breeding season is over, both males and females go back to sea, to feed and replace the energy lost during this time, to get ready for the next breeding effort. They feed mostly on squids, that make about 80% of their diet.

Any other question about elephant seals life that you may find relevant

And why Sea Lion Island as your study site ?

(S) Sea Lion Island is a small, nice place with a small population of elephant seals, which is almost isolated. This means that even with a small research team of 4 to 6 people we can accurately monitor the activity of each breeding individual, and this is a plus to any research activity. Sea Lion Island shelters a population of about 550 breeding females, that means a total population of about 1800 individuals of all ages. It is big enough to make our research interesting and meaningful, but at the same time not too big to make it difficult or impossible to manage the research plan. In bigger populations, a known individual can just move a few hundreds meters away and get lost, whereas on Sea Lion Island we are proud to say that we know almost each animal and their history. This gives to the research an incredible value !

Are there elephant seals in other parts of the Falkland Islands ?

(S) Sea Lion Island population is the what remains of a formerly much larger population in the Falklands, and represents the only big breeding colony of the islands. Given the complex geography

of the Falklands and the huge number of islands and islets, it is difficult to have a clear picture of the global status of the elephant seals. We'd like to invite everybody in the islands to let us know about sightings of elephant seals outside Sea Lion Island during the breeding season, i.e. from September to November, and in particular of females with pups. This will greatly increase our knowledge of the status of this population.

What is your research about in detail ?

(F) The start of this story can be traced back to Charles Darwin. The most exciting part of his theory of biological evolution was sexual selection, i.e., a process by which traits that improve the mating success of the bearer increase their frequency in the population. Elephant seals are an excellent model for the study of sexual selection, because just a few males are able to monopolize a huge number of matings and paternities, and, therefore, the sexual selection pressure on male phenotype is potentially very high. At Sea Lion Island we were able to show, using molecular biology methods, that the few harem holders get most copulations and sire most pups. No animal species show an higher level polygyny. The huge dimorphism in size, and the trunk, are typical signs of the action of sexual selection.

Although this was our starting point for the research, we have gradually expanded our research goals to breeding biology and behaviour at large, and to issues related to conservation. Sea Lion Island population is very small and localized, with almost no immigration of breeding individuals, and for this reason it is a very fragile system. The main point here is that it is not possible to effectively preserve and manage a system without a deep knowledge of it. Therefore research give the basis for conservation policy.

What does doing research mean from a practical point of view ? What do you actually do for three months a year on sea Lion Island ?

(F) The field work is in fact a quite hard job: we wake up early, go to bed late, and we live with the seals for the most of the day. Every day we carry on routine duties like counts, marking of individuals, identification of previously marked animals, and observation of the seal behaviour. Moreover, depending on the specific research goals of the year, and on the time of the season, we record vocalizations for communication studies, we take pictures for body size estimation, we weigh pups, get skin samples for the genetic work, take blood samples for hormone studies, and so on. A large array of big or small tasks that, put together, give a full account of seals breeding.

How do you mark the seals ? Could you please explain the rationale of marking ?

(S) In our understanding, no marks means no research on wildlife. A fundamental concept of current wildlife research is that the basic biological unit is the individual, and that the phenomena observed at population level are the result of individual tactics and strategies. Therefore, it is essential to safely recognize the animals that we are studying. Frequently biologists have to struggle to get a decent sample of recognized individuals. Researchers are often forced to find expensive and complex ways to recognize their study animals, often involving the capture of the animals, with all the stress involved in that. You can just think at whales and other cetaceans. In most case recognition is based on photo-identification, a difficult and time consuming task. With elephant seals we are pretty lucky. They are very friendly with humans, and they can be marked quite easily. We mark elephant seals by putting cattle tags in the membrane between the fingers of the rear flippers. The tags permit recognition of animals in the following seasons, and produce a wealth of data about survival, fecundity, breeding site fidelity, and so on. We also put dye marks on seal back and flanks, to permit their recognition from the distance and the collection of behavioural data. Marking is achieved by surprise, without any kind of physical or chemical restraint and, in fact, the best dye marks are put in place without even waking up the subject. Once the animal is marked with dye, there is no further need for us to approach it at a close distance, and this greatly reduces the disturbance to the animals and the invasiveness of the research.

How big are the elephant seals ? How do you measure their size ?

(F) The first thing you will notice when seeing seals in the field is they are big and fatty. At Sea Lion Island, males may weigh more than 3000 kilograms for a length of more than 5 meters, while females may get up to 800 kilograms and 2.5 meters. Obviously, it is not that easy to estimate size and weight of so large animals. To avoid any direct handling and disturbance to the animals we devised a photogrammetric method. In plain words, we take a digital picture of the side of the subject while an helper keeps a calibrated surveying pole over his back. The picture is then measured using an image analysis software, using the pole as scale. The side area gives an excellent estimate of weight. This way we are able to collect a large number of measurements for all breeding males and estimate weight loss. Last year the biggest male was 3200 kilograms and he lost about 47% of his body weight during the 90 days of the breeding season.

You mentioned something about studying elephant seals communication. What is that about ?

(S) Animal communication is my particular field, and it's the topic of the PhD I'm currently finishing. If you visit an elephant seal colony during the breeding season, the first thing you'll notice is the incredible noise surrounding: pups trying to get the attention of their mothers, females calling their pups to keep them close, and of course males, with their deep voice, challenging one each other by means of vocalizations. An hot topic of current biology is the evolution of animal communication. Animals are seen as models for the understanding of human communication, and there are increasing evidences that many species, including primates and whales, have fairly complex communication systems. Male elephant seals use vocal communication to settle contests with other males without the need to fight. We are trying to understand what those vocalizations actually means. During the past years we discovered that males can recognize one each other by their voice; moreover, information about their age, size and status are conveyed into the vocalizations, which help them in deciding whether to carry on a fight or to leave. Finally, we recently discovered a very interesting aspect of elephant seal vocal communication. Similar to what happens in many bird species, and of course in humans, elephant seal males learn how to vocalize from older and more experienced individuals, a phenomenon rarely demonstrated in other mammals.

How could people get more information on the seals and on your research ?

(S) We got a detailed web site about our research, at www.eleseal.org. Moreover, booklets on the research are available for consultation at Falklands Conservation office in the Jetty Centre. But in the end, we are sure that the best way to know more about the elephant seals, is to come and meet them in person at Sea Lion island !

How long have you been studying at Sea Lion island ?

(S) The current is the tenth year of the study, that we begun in 1995. Ten is a nice number, so we hope to celebrate this year ! We'd like to have a big party with the elephant seals on Sea Lion, perhaps offering them some free squids. Just joking, really we hope to be able to raise our glasses with all our friends and supporters, in honour of these fantastic animals, when we'll be back from the field in late November.

Is there anybody that you wish to thank ?

(F) We would like to thank all the people of the Falklands for the help and support given to us and the research along the years. We wish to thank the FIG for granting us the research permit, the FIDC for letting us do the field work at Sea Lion Island, and the Sea Lion Lodge owners and managers for their logistic support. A special thanks goes to David and Patricia Gray, to Jenny Luxton, and to the Sea Lion Lodge staff that always made us feel at home. Finally, we would like to thank the seals for their kindness and patience, their was the most important contribution to our research.