

Elephant seals: 10 years of research



The Elephant Seals Research Group is an Italian research organization dedicated to the study of elephant seals around the world. In 1995 we started a long-term research project to study the southern elephant seals (*Mirounga leonina*) of Sea Lion Island.

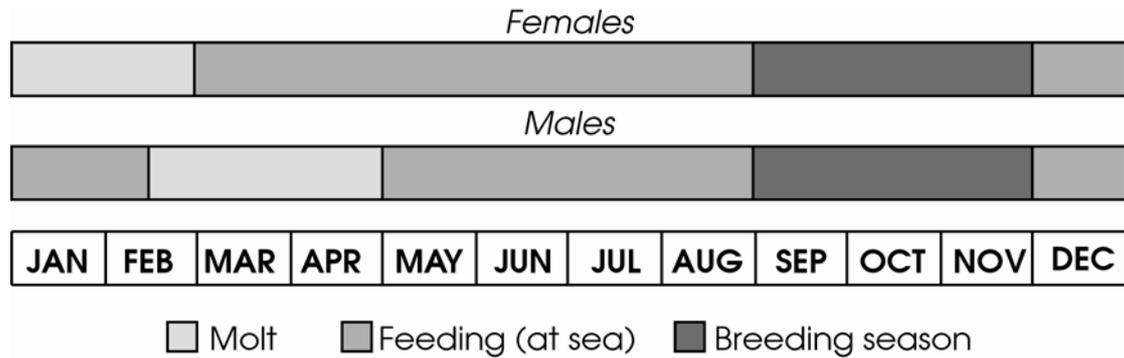


We are now at our 10th season of field work in the Falklands, and we are happy to have given our contribution to the knowledge of this species, an important component of the island's biodiversity.

We thank all the people that helped us along the year; FIG, FIDC and Strachan Visick Ltd for permits and support; David and Patricia Gray, Jenny Luxton and the Sea Lion Lodge staff that always made us feel at home. Last but not least we thank the elephant seals, without which, our adventure would have never started!

We are looking forward for another ten years of discovery!

The southern elephant seal life cycle



Southern elephant seals spend the most of their lifecycle at sea, deep diving (up to 1500 meters) to get squids, the main component of their diet. They haul out only for breeding and moulting.

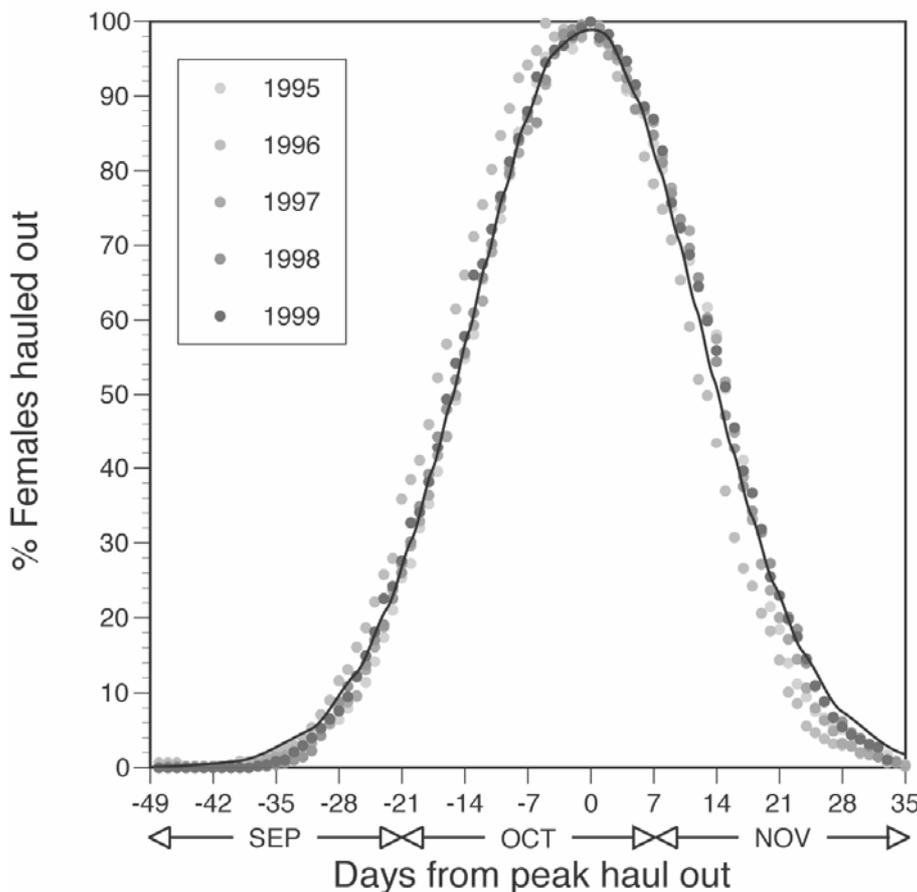


Elephant seal females start breeding at about 4. Each year they give birth to a single pup, which weighs a mean of 36 kg. They suckle the pup for about 3 weeks, before mating and going back to sea. The pup is weaned abruptly, and left alone on the beach.

Weanlings weigh a mean of 136 kg, but some of them go up to more than 200. They remain on land for 6 to 8 weeks, fasting, building up muscle, and gradually improving their swim and dive skills. Then they go to sea for their first feeding trip.

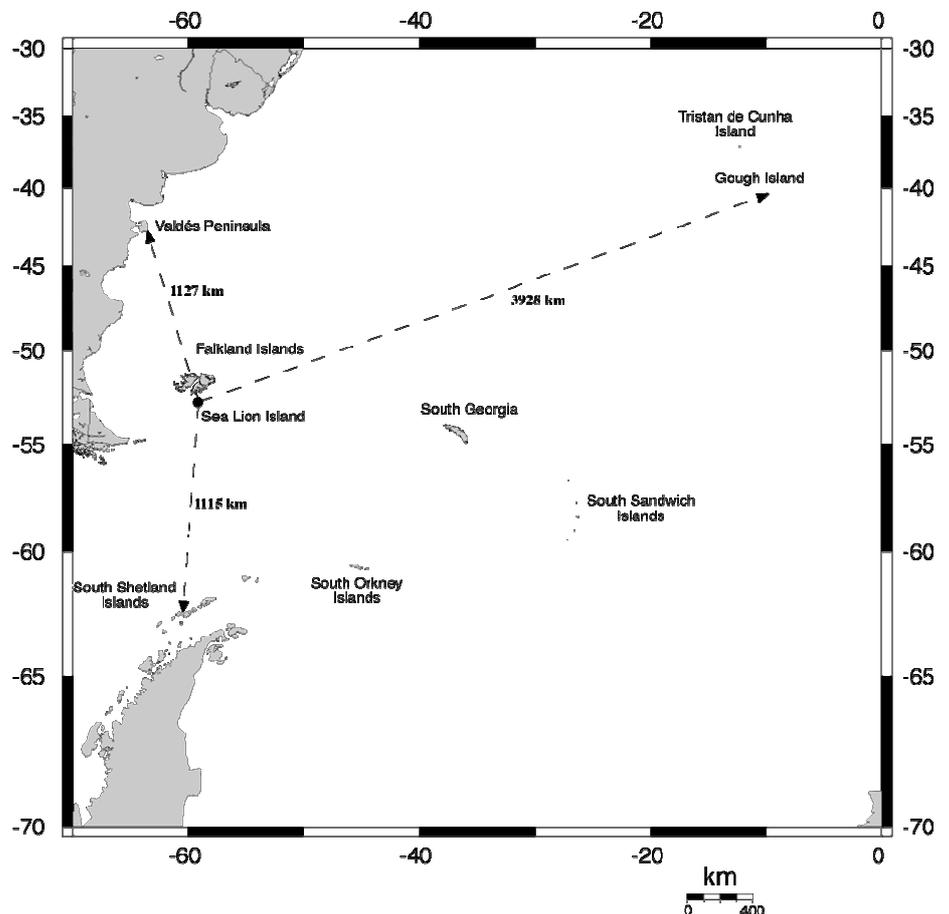


The Sea Lion Island elephant seals



The Sea Lion Island population is small and isolated, with about 550 breeding females and 1800 individuals in all. It is the only large breeding colony in the Falklands. During the breeding season each female hauls out with a regular pattern and the number of females on land has a bell shaped variation. Peak haul out is always 19 or 20 of October.

Sea Lion Island is part of the South Georgia elephant seal stock. Although the population is isolated during the breeding season, foreign animals are seen on the island for the moult. Moreover, individuals tagged at Sea Lion Island have been observed in other places, including Gough Island, at almost 4000 km of distance.



Marking of elephant seals



The seals are marked by putting cattle tags in the membrane of the rear flippers. Tagging is carried out by surprise, with no restraining. By putting tags we are able to recognize individuals along their lifetime.



To permit an easy recognition from the distance, the seals are marked by putting names on their back, flank, or belly using hair dye. This permits to reduce the disturbance to the seals and, therefore, increase the ethical standard of the research. Dye marks are lost with the annual moult.

The elephant seals social structure



On Sea Lion Island, more than 90% of females breed in harems of up to 125 females at peak haul out (average of 35 females). Usually only the harem holder or *alpha* male is found among the females and males that are not able to get control of an harem (called *peripheral* males) roam around trying to get some copulations when the harem holder is busy or not paying attention. In some case also a *beta* male (a male within the female group but subordinates to the alpha) is present in large harems.

To study the spatial structure of the seal population, that may greatly affect the social behaviour, we map individuals with a GPS system. To get the position we simply approach the resting animals and collect the fix.



Male body size and morphology



The first thing everybody notice is that elephant seals are big, and males are much bigger than females, a likely result of evolution by sexual selection. Males may weight up to more than three tons and females up to 800 kgs.

Due to their size, direct measurement of elephant seals is not easy. Hence, we use a photographic method. We take pictures of the animal with a calibrated pole in view, and we measure them with a special software. The side area gives an good estimate of weight.



Behaviour: male competition



One of the main target of the research is the variation of male mating tactics. Male elephant seals compete for the access to females, using both direct fights and assessment.

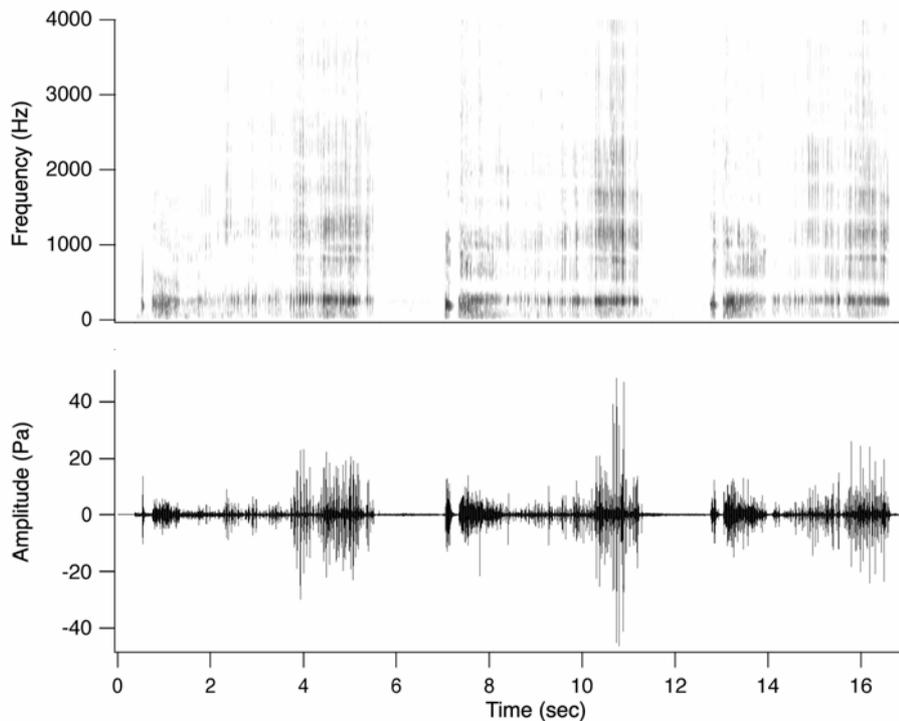


The result of this competition is a huge skew in the distribution of copulations, with few males fertilizing most females. We are investigating which aspects of male phenotype build up a successful fighter.

Vocal communication: sound recording



To study the function of male acoustic communication we record their vocalization in standard condition of stimulation.



Male elephant seals use vocalizations to settle contests with other males without fighting. Each male has a specific vocalization, and the sound contains information about its size, age, and breeding status.

Parental investment: weighing of pups



Parental investment in elephant seals is all on the side of the mother. Pups and weanlings weight represent the best index of this effort. Pups are weighed using a custom made canvas bag and a digital dynamometer and are restrained by hand, always keeping the handling time very short to minimize disturbance. In no case weighing of pups resulted in physical damage or abandonment by the mother.

Pups at birth have a mean weight of 36 Kg for a length of 130 cm. After only three weeks of suckling, when they are weaned, their mean weight increases to 136 Kg, with some animals reaching up to 220 Kg.