



### OFF WITH THE OLD ...

As the busy, noisy winter season of the elephant seals winds down in March, this year's pups, now called weaners, whose mothers have weaned them, mated and headed to sea, frolic in the shallow pools among the near-shore rocks. They are learning to swim and dive well enough to head north and west on their first journey to forage for food. As the weaners leave the viewing site, juveniles and females begin to arrive for the first chapter in the molting season.

This is a much quieter time, when the seals bask in the sun, shedding a layer of skin and all of their hair in what is called a catastrophic molt. The skin comes off in patches and they look so tattered that visitors sometimes ask if they are sick or dying. But the molt is called "catastrophic" because instead of losing bits of hair and skin throughout the year as many animals do, elephant seals shed it all at once as they rest on the beach for from four to six weeks.

Different ages and genders come in at predictable times, and one of the most interesting things about the round robin process is wondering how they know when it's their turn—as well as where to go. Females and juveniles from about two to six years old arrive first. When molting seals arrive, they are a dull tan or brown, with skin beginning to peel. They are also pretty round, filled out for their molting fast. By the end of the molt in May they are thinner, and they wear their sleek new silvery gray coats as they head north-west, one by one, to feed again.

In June, subadult males, the seal version of adolescents, come in to molt. These guys are more lively than the females and juveniles. They like to spar and play, challenging each other with their deepening voices, banging necks together and nipping necks in mock fights. The noses of the juvenile males are pointed, just beginning to grow into the proboscis that gives elephant seals their

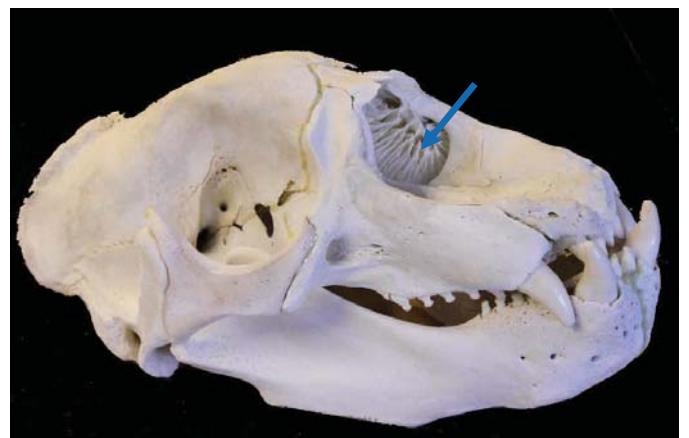
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For up-to-date information, visit our web site at [www.elephantseal.org](http://www.elephantseal.org)

### WHAT WE HAVE LEARNED

**Nor Any Drop to Drink:** One of the most remarkable aspects of the elephant seal fasting while in the rookery is the fact that they have no water intake at all during fasts, some of which exceed three months. Even healthy humans in a good situation can't live a week without water. How do the seals manage it? The water they lose is almost entirely from respiration as they do not perspire and, in the rookery, do not urinate. When air is inhaled into the lungs it is heated to body temperature – close to our own – and absorbs moisture from the lungs since warm air can hold much more water than cold air. Air that is exhaled, therefore, is more moist than inhaled air. While the metabolism of their blubber and protein during the fast generates a small amount of water, it would not, without two special conserving strategies, be nearly sufficient.

The first such strategy is simply to breathe less: in the rookery the seals go into apnea – quit breathing – about 50% of the time. The second strategy is to capture and reuse most of the moisture absorbed in the lungs. This is accomplished by elaborate bony structures called the turbinate processes, in the nasal passages with surface areas up to three square feet. During inhale, the cold air cools these structures. During exhale, the warm moist air from the lungs is cooled as it passes through the structures and 70% – 75% of the moisture added by the lungs is condensed out and recycled. The combination of the two strategies, producing a water loss of only 15% of what would otherwise occur, means that water loss is not a limiting factor in the fasting.



**Skull showing the turbinate process**

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Tips for Safe Viewing

- View from a safe and respectful distance.
- NEVER get between a seal and the water.
- Dogs and seals don't mix. Keep dogs away from the seals
- Please stay off sand dunes which are fragile areas for plants and animals.

Elephant seals are protected by law. It is illegal to harass any marine mammal. If you witness harassment, call 1-800-853-1964.

**Map to Elephant Seal Viewing Piedras Blancas**



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**Visit our office, gift shop,  
 and displays at the  
 Cavalier Plaza, Highway 1  
 San Simeon**

**Three Staff Positions** - The Board of Directors, by adding one half-time position, has three part-time office positions in order to more efficiently provide service to our members, visitors and volunteer docents. All the positions overlap though, to ensure speedy response to all our *Friends* questions and needs.

Office Manager & Bookkeeper – Marcella Boteilho

Marcella provides the overall continuity in running the Friends office, which includes but is never limited to the bookkeeping, our Gift Shop, coordinates all special projects, serves as the liaison between our members, visitors, office staff and the Board of Directors.

Docent Coordinator – Ellen Stoner

Ellen handles “all things volunteer docents”, from monthly scheduling, docent communications, docent data, keeping the stats for docent volunteer times served, journal entries, etc., supplies, suggestions, etc.

Outreach Coordinator – Diana Teetzel

Diana will oversee all of the Friends outreach programs. These currently include the School Programs, Bus Tour Presentations, PowerPoint Presentations, and Educational Booths. She administers the Membership Roster and is the Friends Facebook page (LIKE us if you have not already done so; lots of great information). New areas of growth she administers are the Friends educational seminars offered to our Members and community-at-large.

Plan now to join **The Catastrophic Molt Exploratory & Rookery Tour** on May 4 or May 11, 2013. Early May is the time of maximum population in the Piedras Blancas Northern Elephant Seal Rookery. Thousands of pregnant females—and juveniles of both genders—return to the rookery to grow new skin and shed the one grown last year. The molt is particularly important for a pregnant adult because the egg fertilized in late January or February has not yet implanted in the wall of the uterus and has not yet begun to draw nourishment from her body. At the end of the molt, the dormant egg--that has been carried for over 100 days--implants and a seven to eight month gestation begins. Our exploratory will examine the molting process, delayed implantation, and other adaptations vital to the elephant seals' land/sea existence.

The dates for our 2014 Exploratory & Rookery Tours have been set:

**Birthing and Nursing** January 4, 11, 18, and 25, 2014

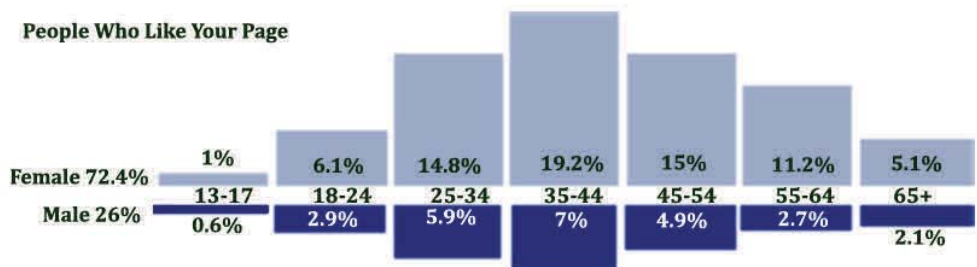
**Mating and Weaning** February 1, 8, 15, and 22, 2014

**The Catastrophic Molt** May 3 and 10, 2014

**Distant Friends**

**Webcam:** A failure in the radio link between the light station and the State Parks computer put our webcam off line for a few weeks. New equipment has now been installed and should work more reliably in the future. Before it went down, we made a study of where our viewers came from. In one week we had more than 4000 viewers from all 50 states and from 50 countries around the globe.

**Facebook:** Similarly, the Friends of the Elephant Seal Facebook page attracts “likes” from many nations and in many languages. The age and gender distributions are shown below:







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name. By the time they are subadults, the proboscis has widened and lengthened. Their vocalizing sounds like a deep belch as it begins to develop into the booming bellow of an adult male.

Adult males return from their round trip to Alaska in July. Bulkied up to fast while they molt, they can weigh up to 5,000 pounds. They may use their booming voices to play the "I'm bigger than you" game, but they usually don't fight when there are no females around. They are more likely to use each other as pillows.

The adult males make their long journey to forage in the Aleutian Island area of Alaska twice a year. They are on land for only four months of the year, and the females, traveling in the open ocean following fish and squid, spend only two months on land.

These marine mammals are really submarine mammals. Researchers, using transmitters and recorders, have recorded dives over 5,750 feet, and there is a dive of over two hours on record, but their dives are usually 1,000 to 2,000 feet and they usually stay down for 20 to 30 minutes. They surface for only a few minutes between dives.

**WHAT WE HAVE LEARNED** (Continued from page 1)

**The Maiden Voyage:** A frequent question on the bluff this time of year is "where do the pups go when they leave the rookery for the first time?" The data on the migration of these young animals is limited because the tracking equipment is expensive and only about two-thirds of the male weaners and one-half of the females survive their first year at sea. However, in 2008 researchers at U. C. Santa Cruz tagged five female weaners at the Ano Nuevo rookery above Santa Cruz before they headed out to sea. The tags were glued to the seals, and were programmed to report for three months. One seal headed southwest, and the other four headed straight north. Some of the tags reported longer than three months, and researchers were surprised to discover that at least two of the weaners made it to the Gulf of Alaska, one of them all the way to the Aleutian Islands.

On their maiden voyages, weaners don't dive as deep as adults – 600 to 1800 feet is normal at the end of a weaner's first journey, with dives lasting from ten to twenty minutes. But they travel just as far as adults, and spend the same amount of time at sea. Consider how astonishing it is for a pup nursed by her mother for less than a month to learn to swim and dive on her own, then swim all the way to the Aleutian Islands and back, a round trip of five to six thousand miles, continuously diving for food.

**A Harrowing Life:** All of us find the loss of pups in the rookery difficult to take. Without punishing storms from the south, the pup survival rate at Piedras Blancas is usually around 94%. The hazards of the rookery for pups, however, pale in comparison to their risks at sea. A recent study of survival at Ano Nuevo indicates that, as noted in "The Maiden Voyage," the survival rate for the first year is only half for females and two-thirds for males. The two-thirds survival rate for males is roughly constant throughout their lives with the oldest known male reaching 15. The survival rate for females, while it is lower initially rises rapidly over the first few years and is between 80% and 90% from age 4 to age 18, after which it drops steeply with the maximum age for a female at 22.

As a result of these rates, given equal numbers of male and female pups, there are somewhat more males in the early years with equal numbers again at age 4. Only 1 in 6 survive to that age. After age four the very different survival rates result in many more females than males. At age 10, the peak breeding age for males, with most surviving females having produced pups every year since they were 4, there are three times as many females as males.

