



Patient Highlight: Happy Birthday Liana!

Liana is a yearling California sea lion rescued on May 22, 2020. This time last year, Liana would have been born in Southern California, where most breeding for this species takes place.

After Liana was born, his mother would alternate between nursing and leaving him on land to go feed. Mothers do this for 9-10 months until their pup is weaned. Liana's father would migrate north and only return the next year to mate again.



As climate change causes sea level temperatures to increase, fish are moving into deeper waters and further offshore to find colder water. Mother California sea lions must dive deeper and further for food, leaving their pups for longer stretches of time. This can lead to the pups getting hungry while waiting for mom to return and venturing off to find their own food. However, they don't have the kind of stamina it takes to reach these food sources and can become malnourished. This is likely the case with Liana, who was rescued because of malnourishment and pneumonia.

The Marine Mammal Center treats patients like Liana by administering subcutaneous fluids and increasing their weight by feeding them fish or tube feeding weaker or younger ones that are unable to eat on their own. Rehabilitation ranges between 4-8 weeks, and the animals are released when they reach a suitable weight.

California sea lions are sentinels of the sea. By rescuing them, we not only save their lives, but identify changes in ocean health and therefore our own health because we rely on the ocean for many parts of our lives.

How to help patients like Liana

- ✓ Remember to #LeaveSealsBe and call The Marine Mammal Center's 24-hour Rescue Hotline 415-289-SEAL (7325) if you spot a marine mammal in distress.
- ✓ Reduce your carbon footprint through actions such as switching to renewable energy sources and reducing the amount of plastic you use.
 - ✓ Visit <https://www.marinemammalcenter.org/Get-Involved/awareness-campaigns/climate-change/how-you-can-help.html> for more information!



Understanding Delayed Implantation

Are all California sea lions really born on June 15th?

Liana, and other California sea lions, are born in June, with half being born on the 15th. Scientists call this “synchronized reproduction”, which occurs when animals breed and birth simultaneously. This cycle occurs because sea lions have a reproductive strategy called **delayed implantation**.

Three to four weeks after giving birth, females can mate again to give birth the next year. After mating, the embryo does not immediately implant in the uterus. Instead, the embryo remains dormant, suspending pregnancy. Once the embryo does implant, gestation lasts until the following June.



How?! And why?!



Delayed implantation allows for increased survival rates of young by ensuring they are born during an optimal time of year, such as when food and climatic conditions are favorable. For species like the California sea lion, this reproductive strategy allows for males and females to migrate to different ranges during the year and meet at the same time for birthing and mating. Delaying the pregnancy also allows females that just gave birth to have enough energy and strength to support a growing fetus.



How do we know?

Activity

Scientists often study animal behavior and adaptations, such as delayed implantation, by observing animals over time. Researchers generate questions from the data they collect and create hypotheses they can use in future experiments. One observational method used is an *ethogram*, which is a list or catalog of an animal's behaviors.

In order to gain a better understanding about how observations can be used to study animal behavior, you are going to collect data for your own ethogram and create a hypothesis.

Materials:

- ✓ A notebook and pencil or ethogram template to take notes
- ✓ Optional: Laptop, tablet, or smartphone
- ✓ Stopwatch

Instructions

1. Choose your study species. You can either choose an animal you see in your own backyard, a pet, or use a live webcam of wildlife online (<https://explore.org/livecams>)
 2. Every thirty seconds for five minutes, place a check mark in the column on the right of the ethogram each time you observe a behavior.
- *For a challenge, make your own ethogram template or try longer observation periods.
3. Repeat Step 2 three times, using a new ethogram sheet each time.
 4. Answer the following questions below.



Observing like a scientist

What animal did you choose?

What behavior occurred the most?

What behavior occurred the least?

Generate one question based on the behaviors you observed.

Example: How does the change in prey location influence survivorship of California sea lion pups?

Create a hypothesis with a possible explanation for your question.

- Use the following format: **If**... what the problem is, **then**... what you think will happen, **because**... why you think it will happen.
- Example: **If** ocean temperatures increase and drive prey fish into deeper water and further offshore, **then** California sea lion pups will have a low survivorship, **because** they will try to find their own food but will not have the stamina to reach the prey.
