**The Marine Mammal Center's Education Volunteer Program**

*Welcome to our community of Education volunteers!* Volunteers share information about our marine mammal patients’ natural history and highlight our rehabilitation and conservation efforts with visitors. The purpose of our volunteers is to enhance the guest’s experience at the Center.

**Docent Roles:**

**Information Desk**
Information Desk docents orient visitors to the facility, direct them to public viewing areas and answer questions about the work of The Marine Mammal Center and our patients. Docents also help register individuals and families for the Guided Tours we offer.

**2nd Level Viewing Platform**
Docents engage visitors with the natural history of our patients, helping them learn the differences between seals and sea lions as well as why our patients are in need of rescue and care. They also explain the husbandry and medical procedures happening in the pens.

**Outreach Fairs and Events**
Education volunteers staff tables at fairs and events throughout the Bay Area. Docents use specimens, pictures, and activities to educate the public about the ocean environment, how marine mammals are connected to it, and the work of the Center. These events occur periodically throughout the year.

**Tour Leaders (requires additional training)**
Instructors lead guided tours of the facility to families, students, and individuals.

**Requirements for All Education Volunteers**

1. Must attend and complete the 2-Day *Basic* Education Volunteer Training, along with minimally four 4-hour shadow shifts with veteran education volunteers (to be completed within 3 months of training)

2. Volunteer at least eight to sixteen hours per month, preferably on the same shift each week, for at least 6 months after the training period (for example, one four hour shift a week, or every other week on Tuesdays). Shifts are available 7 days a week, with both an AM (9:30-1:30) and PM shift (1:00-4:30).

3. Must shadow an animal care crew for one day (requirement can be waived for volunteers with prior experience on a Center animal care crew).

4. Attend a minimum of two 3-Hr *Advanced* Education Volunteer Training sessions annually. These trainings are offered numerous times a year and provide both a chance to review and update information covered in the basic training as well as dive into new topics.

5. Attend minimally two Education Volunteer Meetings each year. These meetings include updates about current research and patients as well as departmental news and guest speakers. Education Volunteer Meetings typically take place in February, May, August, and November each year.
Agenda for 2-Day Basic Education Volunteer Training

These classes train new volunteers to become an education volunteer at The Marine Mammal Center. They are required for all volunteers wanting to docent at the Sausalito hospital, participate in fairs or events in the San Francisco Bay Area, and lead tours of the hospital.

Day #1
10:00-10:45 Welcome and Introductions
10:45-11:15 Overview of the Marine Mammal Center
11:20-12:45 Interpretation and Customer Service
12:45-1:15 Lunch (bring your own)
1:15-4:15 Diagnosing Diseases and TMMC Patient Stories
4:15-4:30 Questions and Wrap-up

Day #2
10:00-10:30 “Trivia Time“ (TMMC overview; pinnipeds; specimens)
10:30-11:45 Climate Change
11:50-1:05 Sustainable Seafood
1:05-1:35 Lunch (bring your own)
1:35-2:30 Ocean Trash
2:35-4:00 “Find Your Voice” Docent Practice
4:00-4:30 Next Steps and Moving Forward

Timing is subject to change based on the decisions of the instructors.
Guest Experience Staff

Adam Ratner, Guest Experience Manager, ratnera@tmmc.org, 415-289-7356

Adam joined The Marine Mammal Center in 2009. Overseeing visitor operations, he challenges guests to think differently about ocean conservation using the stories of individual patients that are rescued by the Center. He incorporates topics including climate change, ocean trash, and sustainable seafood into the Center’s guest experience, in some cases exposing visitors for the first time to the simple idea that their actions have an impact on the ocean. Adam was named one of the 30 under 30 for Environmental Education by the North American Association of Environmental Education, is a leading member of the National Network for Ocean and Climate Change Interpretation, and a founding member of the Bay Area Climate Literacy Impact Collaborative. At The Marine Mammal Center, Adam volunteers each week caring for the seal and sea lion patients, and has previously volunteered within the rescue department.

Adam graduated from Bates College with degrees in Marine Biology and Psychology with a focus on animal behavior. He has spent time conducting research in the field and studying animal behavior in labs around the country. His research includes studying bird hearing, as well as, fish learning and memory.

Laura Gill, Public Programs Coordinator, gill.l@tmmc.org, 415-289-7376

Laura started at the Center in March 2018 and leads the development of interpretative content and delivery methods for visitor programs/tours, exhibits and other resources. Prior to working at the Center, Laura for many years routinely partnered with The Marine Mammal Center in her role leading and overseeing public programs at the Aquarium of the Bay and Sea Lion Center at PIER 39. Laura has a strong passion for conservation and is a member of the Bay Area Climate Literacy Impact Collaborative.

Before joining Aquarium of the Bay, Laura earned her B.S. in Marine Biology from UCSC and had previous experience in the aquarium world as the Assistant Director / Volunteer Coordinator / Educator at the Roundhouse Aquarium in Manhattan Beach, CA.

Diane Hardy, Guest Experience Team Coordinator, hardyd@tmmc.org, 415-754-4032

Diane started with The Marine Mammal Center in February 2017 as a volunteer on the Sunday crew helping to take care of the seal and sea lion patients. Soon thereafter, she applied and was accepted as the Public Programs intern within the Guest Experience team and was able to blend her passions for biology and conservation. Serving two intern terms as a Public Programs intern, she played an invaluable role in leading guided tours and behind the scenes experiences for guests and supporting the volunteers on a daily basis. Diane currently serves as the Guest Experience Team Coordinator and leads the recruitment, training, mentoring and retention of the Center’s over 130 Guest Experience volunteers and interns.

Having grown up in France and California, Diane traveled to Canada where she attended and graduated from McGill University with a B.A and Sc. having specialized in environmental science. She was particularly drawn to not just the world of biology, but also have science, politicians and the public communicate around those topics.
# Table of Contents

Education Volunteer Program Overview ..................................................................................... 1
Agenda for Basic Education Volunteer Training........................................................................ 2

**Introduction to The Marine Mammal Center**
- Statement of Purpose and Values ......................................................................................... 7
- Education, Guest Experience and Retail Department................................................................. 8
- The Marine Mammal Center Fact Sheet .................................................................................... 10
- Frequently Asked Questions ..................................................................................................... 12

**Interacting with Guests Best Practices**
- Interpretation............................................................................................................................ 19
- Customer Service...................................................................................................................... 20
- Policies and Safety.................................................................................................................... 21

**Tour of The Marine Mammal Center**
- Information Desk and Exhibit Hall ......................................................................................... 23
- 2nd Level Viewing Area ........................................................................................................... 25
- Gift Store.................................................................................................................................. 26
- Laboratory and Research .......................................................................................................... 27
- Pens/Pools and Filtration System ............................................................................................. 28
- Satellite Facilities....................................................................................................................... 29

**Introduction to Animal Care and Common Diagnosis**
- Overview of Animal Care ........................................................................................................ 31
- Rescue and Release .................................................................................................................. 32
- Typical Animal Care Crew Schedule ....................................................................................... 34
- Feeding...................................................................................................................................... 35
- Malnutrition (California Sea Lions).......................................................................................... 36
- Maternal Separation and Malnutrition (Elephant Seals)......................................................... 37
- Maternal Separation and Malnutrition (Harbor Seals)............................................................ 39
- Maternal Separation and Malnutrition (Fur Seals)................................................................ 40
- Maternal Separation, Malnutrition and Other Ailments (Hawaiian Monk Seals)................... 41
- Domoic Acid Toxicosis .............................................................................................................. 43
- Leptospirosis............................................................................................................................. 45
- Cancer...................................................................................................................................... 47
- Pneumonia................................................................................................................................. 49
- Parasites..................................................................................................................................... 50
- Human Interaction..................................................................................................................... 51
Pinnipeds of California
  Overview of Pinnipeds........................................................................................................ 53
  California Sea Lions............................................................................................................. 55
  Northern Elephant Seals..................................................................................................... 57
  Pacific Harbor Seals.......................................................................................................... 59
  Northern Fur Seals............................................................................................................. 61
  Guadalupe Fur Seals.......................................................................................................... 63
  Steller Sea Lions................................................................................................................ 65
  Hawaiian Monk Seals......................................................................................................... 67

Ocean Health
  Climate Change.................................................................................................................. 69
  Sustainable Seafood............................................................................................................ 71
  Ocean Trash....................................................................................................................... 73

Other Marine Mammal Fact Sheets
  Overview of Cetaceans....................................................................................................... 75
  Gray Whales....................................................................................................................... 76
  Humpback Whales.............................................................................................................. 78
  Blue Whales....................................................................................................................... 80
  Porpoises and Dolphins....................................................................................................... 82
  Orcas.................................................................................................................................. 84
  Sperm Whales..................................................................................................................... 86
  Vaquita............................................................................................................................... 88
  Sea Otters........................................................................................................................... 90
  Wild Marine Mammals in the Bay Area................................................................................ 92
  Local Marine Mammals in Captivity................................................................................... 93
At The Marine Mammal Center, we are guided and inspired by a shared vision of a healthy ocean for marine mammals and humans alike.

Our Mission
The Marine Mammal Center advances global ocean conservation through marine mammal rescue and rehabilitation, scientific research, and education.

Our Work
We rescue and rehabilitate sick and injured marine mammals at our state-of-the-art veterinary facilities by engaging a dedicated workforce and supportive community.

We learn from the patients in our care and contribute to scientific understanding of the changing health of our ocean, taking action to address ocean threats and save endangered species.

We lead as a teaching hospital by training veterinary professionals locally and internationally, and inspiring future ocean stewards through innovative school and public education programs.

Our Credo
We are all one community, compassionate and respectful of each other as we work together to accomplish our mission.

We engage in honest, thoughtful communication and remain open to feedback and new ideas.
We embrace diversity and bring a positive approach to our work as a team.
We take pride in what we achieve together and continually strive to learn and improve.
We build trust by honoring commitments, taking responsibility for our actions and assuming good intentions in others.
Education, Guest Experience and Retail Department

The Education, Guest Experience and Retail department is responsible for the oversight of all visitor operations, public programs and school and teacher programs. Each year, the Center sees approximately 100,000 visitors to the hospital and is responsible for formal and informal educational programs that reach 50-70,000 individuals.

The Education, Guest Experience and Retail department consist of 14 full-time staff and 1 part-time staff, within 4 divisions:

- Guest Experience
- School and Youth Programs
- Administration
- Retail

Divisions of the Education Department

**Guest Experience (GE)**

The GE team is responsible for all of the day to day visitor and education operations, including:

- Education volunteer program, consisting of approximately 130 volunteers
- Exhibits and signage
- Visitor programming, such as guided tours, behind-the-scenes experiences and audio tours
- Conservation initiatives, such as climate change, sustainable seafood and ocean trash education
- Special events, such as Marine Science Sunday and Sea Lion Soiree
  - Marine Science Sundays are monthly theme days occurring on the 2nd and 4th Sunday of each month, with new themed classroom programs each month. Free 45-minute classroom programs occur at 12 pm and 2 pm with themes ranging from Creatures of the Deep and Animals of the Arctic to Magnificent Migrations.

- **Staff include:**
  - Adam Ratner, Guest Experience Manager
  - Laura Gill, Public Programs Coordinator
  - Diane Hardy, Guest Experience Team Coordinator

**School and Youth Programs**

The School and Youth Programs team works closely with organized groups (including schools, families and youth organizations) to provide programs that excite, engage and empower people of all ages around marine science, marine mammal health and ocean conservation. School programs provide both students and teachers educational experiences for audiences ranging from pre-K to college-aged.

- **Learning in the Lab** offers grade-specific tours of the hospital that connect to Next Generation Science Standards and engage students on the work taking place at the hospital, ocean health and stewardship.
- Responsible for our outreach programs (“Sea to School”), allowing us to take specimens and hands-on activities to schools and libraries within 60 miles of the hospital in Sausalito.
- The **Youth Crew** program is a service learning youth volunteer program designed for high school students 15-18 years old where they work alongside adult volunteers in the Education and Veterinary Science departments for a 7-month session each spring and summer.
- **Ocean Ambassadors**, a year-long middle school partnership where teachers are provided with curriculum to teach marine science and share the Center’s work to their classes. The program provides funding for multiple fieldtrips to the Center and to see marine mammals in the wild.

- **College Connections** is a customize program created for college and university students to engage with the experts about the cutting edge research, conservation and veterinary work at the hospital.

- **Seals & Slippers**: An overnight program designed for elementary school-aged students and their families to spend the night sleeping under the stars at the Center while participating in fun, educational activities such as a fish dissection in our Necropsy lab, observing the night feed of our patients and a morning hike to Rodeo Lagoon to observe wild river otters.

- **Camp Sea Quest**: A summer camp designed for rising 1st-8th grade students. The camp is a week-long day camp that engages students in activities both at the Center and throughout the Marin Headlands focused on marine science and ocean conservation.

- Other extended learning programs include: **TMMC LIVE (virtual learning programs)**, **Scout Tours and Barkday Parties/Tours**.

**Staff include:**
- Jennifer Walker, School and Youth Programs Manager
- Sara Smith, School and Youth Programs Coordinator
- Rachel Fowler, Marine Science Program Specialist
- Cameron Steinback, Marine Science Program Specialist
- Tara Spiegel, Marine Science Program Specialist (at Ke Kai Ola in Hawaii)
- Bella Reyes, Marine Science Educator
- Jade Fugini-Laws, Teacher Engagement Specialist

**Administration**

Responsible for the overall strategic vision, management and integration of education programs

- **Staff include:**
  - Rachel Bergren, Director of Education, Guest Experience and Retail
  - Danielle Henderson, Education Programs Assistant

**Retail**

Responsible for overseeing all aspects of the Center’s onsite and online gift store

- **Staff include:**
  - Annie Caporaso, Retail Operations Manager
  - Annie Cheng, Retail Operations Coordinator
  - Lexi Nation, Retail Sales Associate
The Marine Mammal Center Factsheet

The Marine Mammal Center is the world’s largest marine mammal hospital and education facility. It is not a zoo or an aquarium. Once patients are deemed healthy, they are released back to the ocean with a second chance at life.

**Mission:** Rescue, Rehabilitate, Educate, Research and Release

**Rescue** -- Largest facility in the world by the number of animals rescued

- **Rescue range:** 600 miles from San Luis Obispo to Mendocino County and inland bays and deltas, with triage facilities and/or volunteer teams in San Luis Obispo, Monterey, Anchor Bay and Fort Bragg counties
- **Average number rescues each year:** 600-800 animals
- **Success rate:** Slightly under 50%, but varies greatly by species and year
- **Record 1,801 patients rescued in 2015** (over 1,350 sea lions admitted)

**History**

- **Founders:** Lloyd Smalley, Paul Maxwell, Pat Arrigoni
- **Founded:** 1975
- **Site:** Former Nike missile site, Fort Cronkhite
- **In the Center’s first year, we rescued 7 animals**
- **New Hospital/Cost:** Opened 2009, costing $32 million

**Funding**

- Non-profit 501(c)3
- Over 80% memberships/private donations (remaining budget from education/retail sales)
- Annual operating budget: Approximately $10 million
- Minimal government funding available through research grants

**Staffing**

- **Number of paid staff:** Approx. 70 (50% Veterinary Science/Stranding and 50% Education/Advancement/Administration)
- **Number of Veterinarians on Staff:** 7
  - 6 Full-Time (Dr. Shawn Johnson, Dr. Claire Simeone, Dr. Cara Field, Dr. Francis Gulland, Dr. Padraig Duignan and Koret Intern Dr. Emily Whitmer)
  - And don’t forget Executive Director, Dr. Jeff Boehm!
- **Number of volunteers:** Over 1,200 (ages have ranged from 15-97)
- **Volunteer opportunities:** Animal Care, Education, Events, Retail, Fundraising, Specimen Preparation, Rescue and Response (includes rescue & release), and Research

**Patients**

- **Most common:** California Sea Lion (CSL), Northern Elephant Seal (ES), Pacific Harbor Seal (HS)
- **Busiest season/why?:** Peak season is March to October (following pupping patterns)
- **Highest number on site/what year?:** 291 in April 2015
- **Number of pens:** 55 (Topside 22 pens/pools, Quarantine 11 pens, Harbor Seal Hospital 22 pens)
- **Patient capacity:** Unknown, but minimally 291 patients. We have never turned an animal away due to capacity.
- **Total patients responded to:** Over 23,500 animals since 1975
Diseases/Reasons for Rescue

- **#1 reason for stranding**: Malnutrition (either primary reason or secondary to other ailments)
- **Human Interaction**: 80-100 patients rescued each year, which includes harassment, ocean trash (ingestion, entanglements), gunshots, illegal pick-ups, etc...
- **Sea Lions**: Malnutrition, domoic acid toxicosis, leptospirosis, cancer, trauma, human interaction
- **Elephant Seals**: Maternal separation, malnutrition, parasites (*Otostrongylus*)
- **Harbor Seals**: Maternal separation, malnutrition, illegal pick-ups, harassment

School Groups and Outreach

- **School-Aged Tours**
  - Grade-specific programs for ages preK-College
- **Sea to School Outreach Programs**
  - We travel up to 60 miles bringing specimens and activities to turn a room into a marine mammal museum and laboratory
- **Camp Sea Quest and Seals and Slipper Overnights**
- **Visit MarineMammalCenter.org/education** for program descriptions and pricing details

How Can You Help?

- Become a Member
- Shop in our Retail Store or Online
- Make a Donation
- Tell Friends and Family to Visit
- Become a Volunteer
- Adopt-A-Seal
- Visit Again as Patients Change
- Be a Good Environmental Steward

Membership

- **Cost**: $25 basic (covers two individuals), Family $150 (covers up to six individuals)
- **Benefits**: Access to Member’s Only events, monthly e-newsletter, 10% Gift shop discount, discounts on tours, programs and other events

Visiting Options

- **Guided Tours**: Adults $10, Seniors (65+)/Military, Children ages 5-17, Members (+1 guest) $5 each, Children 4 and under and New Members are free the day they join
  - 45-minute guided tour by an educator showcasing the patients, hospital and exhibits through stories, demonstrations and behind-the-scene insights
  - Monday and Friday at 1 and 3pm and Saturday and Sunday at 11am, 1pm and 3pm
  - During peak visitor seasons tours offered daily at 11am, 1pm and 3pm
- **Audio tours**: Same pricing as Guided Tour
  - Approximately 45 minutes of narration by veterinarians, staff and volunteers that leads you around the hospital
  - Available 10 am – 3 pm daily
- **Self-guided**: Free and available during normal visitor hours (maps available in several languages at the Information Desk). Suggested donation of $5 per person.

Visitor General Information

- Open daily from 10 am to 4 pm except Thanksgiving, Christmas and New Year’s Day
- Admission is free but a donation of $5 a person is suggested and appreciated
- Group tours of 10 or more should call (415) 289-7330 to make reservations
- Visit MarineMammalCenter.org or call 415-289-7330 for additional information
**Frequently Asked Questions**

**Animal Rescues and Releases:**

- **How do you find patients and get them here?**
  We depend on the public to notify us of any animal that is injured, sick, in a place that is unusual or needs help. We have a 24-hour hotline (415-289-SEAL) for anyone to report an animal stranded or in distress. We assess the situation and dispatch a rescue team if necessary. Our standard rescue equipment includes a carrier, herding boards, various nets and a pick-up truck or van for transport.

- **Do you tranquilize animals when they are rescued?**
  Typically, no. A tranquilized animal is at risk and could drown if the animal jumps in the water before rescue. However, in 2012 we successfully created a modified dart gun and a special “sedative cocktail” that acts to debilitate the animal and make difficult rescue scenarios like PIER 39 and other hard to access locations more feasible. This breakthrough technology is now being used around the world with marine mammals.

- **What is the largest animal you have ever rescued?**
  The largest patient brought on site was a 1,040 lb. subadult Steller sea lion named Simba in 1992. Our Vet staff have also made several “house calls” to larger patients including: “The Hulk” a 3,000 lb. elephant seal treated on the beach with severe lacerations in 1991, “Delta & Dawn” a mother and calf humpback whale pair stranded up the Sacramento River in 2007 with boat strike wounds and, Humphrey, a humpback whale who stranded in San Francisco Bay in 1985 & again in 1990.

- **How many animals don’t make it?**
  The Center has rescued over 23,000 patients since 1975. Our success rate varies greatly by species and year. Unfortunately, we are not able to save all the animals as some are too sick by the time they are found, or have something we can’t treat, like cancer. It is important to remember that every patient we rescue, would not survive on their own. Historically, our success rate is just under 50% for all species. Elephant seals typically have the best success with over 75%, and sea lions and harbor seals closer to 50% as they are frequently rescued in extremely fragile states or suffering from diseases that are not treatable. In some years we have since successes across all species at 61% and recorded our best ever success rate for Harbor Seals at 86%.

- **Do you pick-up dead animals?**
  California Academy of Sciences is the first responder for dead animals. However, we often partner with them and respond to dead whales, dolphins, or porpoises, sea otters, and seals/sea lions in special cases. We can gain valuable knowledge and specimens for species we would rarely or never have as patients. We obtain information for research and insights about marine mammals and the health of the ocean environment, helping us care for the animals we do rescue.

- **What happens when an animal can’t be released?**
  Animals that we restore to health, but are deemed unable to survive on their own in the wild by our veterinary staff are deemed “unreleasable”. We work closely with the National Marine Fishery Service (NMFS) to handle placing the animal in a zoo or aquarium. The animals live out their lives comfortably and serve as valuable educational “ambassadors” for the public. Animals that are deemed unable to be released due to a poor quality of life, and would suffer unnecessarily, may be euthanized.
• **Do you ever have animals come back?**
  Yes, but rarely (approximately 3% per year). These animals are called “restrands.” Since every animal that is admitted to TMMC is given a flipper tag with a unique number any restrands can easily be identified and their detailed history accessed. Many times a patient re-strands not due to the same ailment, but after a great deal of time with a different, unrelated ailment to their first rescue.

• **Are the animals released where they are rescued?**
  No. Animals are typically rescued in locations that are unsafe like public beaches or places where they shouldn’t be located (docks, sidewalks, roads, restaurants, etc). We have a few release sites: Chimney Rock (Pt. Reyes), Fitzgerald Reserve (San Mateo), Bodega Bay, and Rodeo Beach (specific to large sea lions). In special circumstances, we release animals near the Farallones or Channel Islands by boat (Northern Fur Seals, Guadalupe Fur Seals, young sea lion pups). All release locations are safe areas and good re-entry points for the patients to acclimate to the wild.

• **How does the Center follow up on released animals?**
  All patients are tagged with a numbered orange flipper tag registered with the Center and the National Marine Fisheries Service (NMFS) that stays with the animal when released. It is attached like a fashionable pierced earring to the front flipper (for sea lions and fur seals) and the back flipper (for seals). Incidental sightings in the wild can provide an opportunity for a patient status and update. We have been able to identify patients years later using flipper tags and have even seen animals we cared for as pups go on to have pups of their own. The Center may also use satellite tags on select released patients, such as endangered species, for more detailed tracking. Unfortunately, satellite tags are expensive (around $5,000 each) and can’t be used on every patient.

• **What is the maximum capacity at the Center?**
  The most animals we have ever had onsite was 291 in April 2015. Fortunately, we have never had to turn any animals away, but we do have to be creative in terms of space as we are limited by our number of pools and our filtration system. In the past, we have created new temporary pens without pools to accommodate huge numbers of animals on site (when we have over 200 onsite at once) and have built new permanent pens over the years to accommodate increasing patient loads.

• **I called in a rescue in 2012-can you tell me what happened to the animal?**
  Yes, we can. The Center has a detailed medical record for every animal admitted to the hospital that includes the name and contact information of the person who reported the animal. The record also includes the animal’s name, species, rescue date and site, diagnosis and treatments, how long it remained in the hospital, and if/when it was released. (Use the radio and contact the Education Point Person who can pull up the animal’s record)

**Hospital Layout and Life Support Systems**

• **How many pens/pools do you have?**
  55 (Topside 22 pens/pools, Quarantine 11 pens, Harbor Seal Hospital 22 pens)

• **Is the water in the pens heated?**
  No. We monitor the temperature of the pools, but do not control it. The pool’s temperature is in the ~low 60’s, slightly warmer than the ocean.
• **Do you use ocean water? Don’t the patients need to be in saltwater?**
  We do not use ocean water and our patients do not need to be in saltwater. We buy water from Sausalito and prefer to “customize” the water in our pens. We add salt and can adjust the salinity level (currently around 15-20 ppt.), which is about 50% that of the ocean (~32ppt). Saltwater is helpful with wound healing and skin health.

• **What is the purpose of the solar panels?**
  The solar panels allow the Center to reduce our reliance on fossil fuels and decrease overall energy consumption by ~35% annually (the Center receives the rest of its energy from renewable sources like solar and wind through a program called MCE). As a secondary benefit, they also provide a shaded resting area on a sunny day for our patients. In the state of California, solar energy is also now cheaper than fossil fuels, allowing the Center to save money!

• **How is the water in the pens filtered and disinfected?**
  The Center has its own computer-controlled water treatment facility located underground in one of the previous Nike missile silos. The system filters the water that circulates in the pools and disinfects using ozone gas, returning clean water to the pools. We are able to recycle the water as well and to filter, sanitize and return ~80-85% of the clean water back into the animal pools.

• **How deep/big are the pools?**
  We have a few different size pools with different depths. The pens for elephant seals and sea lions typically range from 4 to 5 feet deep. There are 4 smaller pools specific for harbor seals, as well as 3 large pools (with depths up to 6 feet).

• **Why are some pools built “in the ground” and others “above ground”?**
  The in-ground pools have resting areas at different depths which is helpful for elephant seal pups learning how to swim and maneuver out of the pools. They also improve our volunteer’s ability to work with pups during “fish school”. The above ground pools were designed for sea lions who like to climb on the raised sides of the pool. They are sunken below ground level and are deeper than they appear (~4ft.). We also have 3 in-ground pools in “H” row which are larger and deeper (~6ft).

• **What is the purpose of the footbaths in the hallway?**
  These are filled with a hydrogen-peroxide based disinfectant called Accel. Animal Care crews walk through them to disinfect their boots, preventing the spread of infectious agents between pens and patients. Also, outside the entrance to each pen is a second footbath and a bucket with brushes the animal crews use to “wash” off (slickers, boots, and gloves) each time they leave a pen.

• **Why are there gray tubs of water in the pens?**
  The tubs provide a source of fresh drinking water for sea lion patients afflicted or suspected to have leptospirosis, a dangerous and infectious kidney disease. Ordinarily, sea lions get their water from their fish, but animals suffering from leptospirosis are unable to regulate their hydration. Water is made available to support proper hydration while the animals are being treated with antibiotics.

• **What are those wooden boards for outside/inside of the animal’s pens?**
  The boards are used by Animal Care crews for multiple uses that include: protection, “herding” (moving patients or in/out of pool), to isolate an animal (feeding, giving medications, Vet staff treatments/exams) and to limit the amount of human interaction.
Patients’ Care and Feeding

• **What is the difference between a harbor seal/elephant seal and a sea lion?**
  Sea lions have external ear flaps, long front flippers, and move on land by walking on all 4 flippers. Harbor seals and elephant seals have ear holes, short front flippers and move on land by crawling on their bellies.

• **Why can’t I get closer to the pens/animals?**
  Our patients are wild animals that are sick, afraid and have been placed in an unfamiliar environment. Patients are less stressed with minimal human interaction, sounds and noises. They also have diseases that are contagious to humans (leptospirosis, toxoplasmosis) and humans can also transmit diseases to them.

• **The animals don’t look sick—what’s wrong with them?**
  Some of our patients are admitted with obvious trauma wounds like shark bites, entanglements (fishing line, nets, trash), or gunshots, but many have conditions/diseases that are not so apparent. The most common reason for rescue is malnutrition resulting in severely underweight patients. Other diseases can include: cancer, parasites, domoic acid toxicity, and leptospirosis.

• **How long is a “typical” stay at the hospital?**
  Average length of stay is 2-3 months, but the length of time varies greatly by species and condition of the animal. Orphaned pups often stay longer until they are free feeding successfully and have a clean bill of health from the veterinary staff. Other animals may only spend a few days receiving treatment before release.

• **When is the show? Do you teach them to balance balls on their nose?**
  The Marine Mammal Center is a hospital, not a zoo or an aquarium. Our mission is rescue, rehabilitation, research, education and release. Therefore, we minimize our contact with and around our patients to ensure they can be returned healthy back to their ocean home.

• **Who names the patients?**
  The person who reports the sick animal to the Center, or a member of the public on the beach assisting with the animal’s rescue, gets to name them. If the caller leaves, staff or a volunteer at the Center will provide a name. However, we have responded over 23,500 patients and we don’t use the same name twice in a decade for each species, so we all have to be very creative!

• **What do the animals eat and what time do they get fed? Who decides how much?**
  Feeding times vary, but generally breakfast, lunch and dinner are served around 8am, 2pm and 8pm. Most animals are offered approximately 5% of body weight daily, but may start on much lower amounts when admitted. Pups are tube-fed 3-5 times a day. Vet staff directs all feeding protocols.

• **The animal is lying at the bottom of the pool and not moving. Is something wrong with him?**
  Our patients often rest or sleep at the bottom of the pool which is normal behavior and not indicative of disease or trauma. Many of these animals have remarkable diving abilities and can stay underwater for up to 2 hours at a time. If you watch, you will most likely see him come up to take a breath and then immediately go back to the bottom of the pool to rest.
• **Why do you tube-feed animals?**
  It takes time for a seal or sea lion pup to learn how to nurse from a bottle and involves too much human interaction. Tube feeding is faster, more efficient and the pup generally makes the transition to eating fish more easily.

• **Why can’t I see any animals?**
  We have very few patients at this time—a good thing for a hospital! Our patient load varies seasonally with the winter featuring our lowest patient counts. Some patients are often too sick and easily stressed by the sounds or sights of humans to be placed in an area visible to the public. Also, often young California sea lion pups/yearlings are placed out of public view because they are easily habituated to humans at such a young age, which could impair their ability to be released back to the ocean. While it is not the best for viewing, this is the best medical care for the patients.

• **Where are the harbor seal pups? Why are they in a separate area?**
  Harbor seals are often rescued just days old with extremely fragile/undeveloped immune systems and are easily stressed. Harbor seals have separate crews and are kept in the yellow-roofed building to the right of topside pens.

**Animal Behavior**

• **Do the animals bite or attack the volunteers?**
  Yes, the patients can bite as they are wild animals. However, it is usually done in a fear-related, self-defense response versus an attack. Volunteers are trained to use proper equipment and safety measures for rescues, animal care procedures and all aspects of interacting with patients to avoid bites and other injuries.

• **Do animals get attached to the volunteers and/or do the volunteers get attached to the patients?**
  The patients are wild animals, but they can learn to “tolerate” us, associate the volunteers with food, or especially in the case of young (1 year and under) California sea lions habituate (“like”) to humans. We are aware of the risk of habituation and limit the human interaction to only what is necessary to get the patient well for release. Our #1 priority is to return patients to their homes in the ocean, so despite the urge to attach to the animals we have to minimize as much interaction as possible.

• **How intelligent are these animals?**
  There are many ways to measure intelligence but it’s difficult to quantify. Sea lions are the most commonly found at zoos and aquariums due to their social and playful personalities. They can be taught basic and complicated commands and to understand basic language. Some researchers have compared sea lions’ intelligence to that of a 4-year-old human. In the ocean ecosystem, all marine mammals are all skilled at finding food, escaping predators, and existing in a social structure. This adaptability might also be called “intelligence.” Limited studies have been done on seal species.

• **What do the animals’ noises mean?**
  Animal noises or “vocalizations” serve several purposes. Pups can vocalize to get attention for food from their mothers. Older animals vocalize to exhibit dominance, signal possible aggression or even stress. Younger California sea lions produce a sound similar to a sheep, while adults produce a barking sound. Conversely, Elephant seals cackle (similar to a monkey), and harbor seals produce a sound that sounds like “maaa”.
- **Who decides what animals are placed in together in a pen? Do they get along?**
  Our Veterinary Science staff determines what patients are put together in each pen and group animals by size, age, energy level, and ailment. Volunteers monitor the behavior of the patients by observing if there are issues, especially during feeding, looking for aggression or dominance. Some competition is healthy and naturally occurs in the wild, but too much could be detrimental to the patient’s recovery or increase undue stress.

- **How many animals do you put in a pen?**
  Seals and sea lions are quite social and many times enjoy having other animals in the pen. During our busy season, there can be anywhere from 3-12 animals in a pen, depending on their size.

- **Do you ever put seals and sea lions together?**
  Not often, but does occur in special circumstances. In the wild, seals and sea lions typically ignore each other so it doesn’t cause any problems if it occurs at the hospital.

**Diseases and Injuries**

- **Do the animals have diseases that people can catch?**
  As mammals, seals and sea lions do have many of the same diseases as people, such as pneumonia, cancer and bacterias. A few of them, called zoonoses, are transmittable to people. Bacterial infections might include Seal Finger (Mycoplasma), Leptospirosis, and Salmonella. Viruses include Rabies and Pox Virus and there are also parasites such as Toxoplasmosis.

- **Why would anyone shoot a sea lion? Is it fisherman?**
  We have no idea why or who in many cases. It could be ill-intentions towards marine life or perhaps they are just random acts of irrational violence. It is against the law to hurt or harm any marine mammal though. In the past 10 years, we have treated over 200 patients suffering from gunshot wounds, however only 2 people have been identified and punished with jail time and a fine.

**Current Issues/Problems**

- **Why should I be worried about these animals if I don’t live near the ocean?**
  70% of our Earth is covered by oceans. The ocean connects us in multiple ways. Our patients eat the same fish that we do and the types of illnesses we see in patients are mirrored in humans. We all need to be concerned and will all benefit from changes regardless of how close we live to an ocean.

- **Isn’t it cruise ships that are dumping trash in the ocean?**
  No, most of the trash in the ocean is coming from land—we simply have too much trash and anything on land can get into the ocean through sewers, creeks or the wind. The easiest thing we can all do to prevent ocean trash is to reduce our amount of overall waste and particular plastics. If you do use plastic, please try to reuse and recycle as much as possible, and raise awareness of the implications of ocean trash with friends, family and communities.

- **How is ocean trash affecting marine mammals?**
  Marine mammals can become entangled in or ingest ocean trash. Trash, such as netting and plastic straps, can become tangled around an animal’s neck or flippers, and items such as balloons and plastic bags can be mistakenly ingested as food causing severe health problems for animals. Over 90% of ocean trash is plastic, so simple actions on land reducing our use of plastic can help prevent this problem moving forward.
• **Aren’t you interfering with nature by rescuing an animal that isn’t endangered?**

Although many of the species we rescue are not endangered (California sea lions, elephant seals and harbor seals), the knowledge acquired from treating all of our patients and the research we conduct applies to species that are endangered like Guadalupe fur seals, Northern fur seals and Hawaiian monk seals. The information we acquire from diagnosing and treating all rescued animals and from the research we conduct provides us with skills and a knowledge-base that directly aids in conserving all marine species and teaches us volumes about marine mammals, the status of the different species, and about the marine environment so that we can help protect both marine life and people in the future from harm. Rescuing and rehabilitating animals also allows for us to help offset direct human interaction such as entanglements in ocean trash and gunshot wounds that are frequently seen in marine mammals.

• **With so many issues and problems, how can one person make a difference?**

We can all help and make a difference. For every piece of trash collected off the beach, for every packing strap we cut and every time we choose to use reusable materials instead of plastics, we are saving animal’s lives by making sure trash doesn’t get into the ocean. We can share our successes and actions with friends, family and communities to raise awareness and bring about a collective change. Each person can also contact their state and federal representatives and urge them to vote for legislation aimed at improving the environment, environmental friendly energy practices, and improving the conditions and protection of marine mammals.

• **How is climate change affecting these animals?**

Marine mammals are quite resilient, but warming water temperatures, sea level rise, and ocean acidification are affecting the habitats and food supply for many marine mammals. The burning of fossil fuels like coal, oil, and natural gas release carbon dioxide that acts like a heat-trapping blanket in the atmosphere, raising the temperature of the land, air, and water at an unprecedented and alarming rate. As water warms, fish and other prey are moving towards the poles requiring longer migrations for animals such as gray whales. Rising sea levels also reduce the amount of space on many breeding beaches for elephant seals and Hawaiian monk seals. As a member of the National Network for Ocean and Climate Change Interpretation, we strive to raise awareness on climate change and encourage guests and communities to reduce our use of fossil fuels, like coal, oil and natural gas which can help prevent future climate change.

• **I really enjoy eating fish, but you are saying there isn’t a lot of fish left in the ocean?**

In recent years, we have seen a dramatic decline in many fish species due to overfishing. The decline can be mostly attributed to new fishing methods such as long lining, gill netting, and trawling which accidently catch many marine species like turtles, sharks, and marine mammals, while destroying the ocean floor. Alternative methods such as troll and pole caught fish allow us to still enjoy seafood and guarantee seafood for future generations. As a member of the Monterey Bay Seafood Watch Alliance and the Bay Area Sustainable Seafood Alliance, we provide Seafood Watch guides that share information on what fish is healthy to eat and caught in sustainable ways. These guides are available for both seafood and sushi at the Information Desk, online, and as a free App for any Smartphone.
Interpretation

Interpretation is the process by which we give meaning and value to facts and knowledge. When engaging with guests, we must use interpretative techniques if we are going to inspire action!

Interpretation Best Practices

- Engages
- Utilizes storytelling
- Inspires
- Reveals deeper meaning

Good interpretation can be done in 60 seconds or less!

Engagement

We engage guests to create an emotional connection to the ocean environment, empower them to make a change and to build a sustaining relationship.

“WAVE”

- Welcome: How would you greet this individual/group?
- Audience: Where are you? Who are you talking to?
- Value: What question might you ask to get to know them?
- Empathy: What aspect of our work might they be interested in?

“Welcome, Wow, What’s Next”

- Begins with a warm, friendly welcome, an understanding of what each guest is interested in, and guidance to a powerful and memorable activity
- Continues with a fun and enticing hook, provided while first impressions are still being made
- Engage visitors through our patients and mission

“What, So What, Now What”

- The “What” refers to the question or context (i.e. Why is that animal sick?)
- The “So What” refers to hook and need (i.e. Why should I care if the animal is sick?)
- The “Now What” refers to call to action (i.e. What can I do to help the sick animal?)

Read Your Audience

Determine what they want from you, the interpreter. What do they already know? They may want:

- To interact with you for several minutes
- The answer to only one question
- Solitude to be left alone and watch the animals.

Storytelling: Storytelling is all about showing the big picture and making it relatable.

- What is the main message you want shared?
- How can you make this relatable and meaningful (think values)?
- Can you use a visual or analogy?
- How can I message this in 60 seconds?
- How can they get involved and help?
- How can you leave them wanting more?
Customer Service

Customer service is a crucial element to the guest’s experience visiting The Marine Mammal Center. While knowledge is important, the way that we present the information is the defining element to a person’s experience while visiting. Guest experience staff and education volunteers should be open and available to provide information and guidance to visitors.

What are the Guest’s Experience Goals?
- Have an enjoyable and meaningful experience
- Discover reasons to care about marine mammals and the ocean
- Feel connected to The Center and the animals
- Learn ways they can then help the animals, the environment and the Center

Customer Service Basics
- Acknowledgement/Welcome
- Body Language
- Smile!
- Eye Contact
- Standing to Greet
- Our attitude tells others what we expect in return

Use Questioning Techniques

When we ask the visitors’ questions:
- It helps us start and maintain an interesting dialog with the visitor.
- We find out more about the visitors so we can personalize the information we give and find out what they’re interested in.

Types of Questions:
- Closed Questions: Draws out past experiences, feelings, observations. Results in Yes or No answer.
  - Is this your first time visiting The Marine Mammal Center?
  - Have you ever seen an elephant seal?
  - Typically, very good to get initial snapshot, but not good for getting conversations going
- Open Questions: Lead to better engagement and more information that you can use to customize your conservation to their backgrounds and interests
  - Process Questions: Asks the visitor to compare, classify, sequence or explain.
    - What differences do you see between the seals and sea lions?
    - Why do you think the pens would be different for seals and sea lions?
  - Application Questions: Asks the visitor to evaluate, extrapolate, imagine or invent.
    - Which pinniped (seal or sea lion) do you think can move faster? Why?
    - Why might a sea lion swallow trash?

Tough Questions and Difficult Situations
If you ever feel uncomfortable, use the radio and contact the point person!
- If you don’t know the answer to a question... It is OK!
- “I don’t know. That is a good question; let me find out for you.”
Policies and Safety

The safety and health of each Marine Mammal Center staff, volunteer and visitor is of primary importance to us. We are committed to maintaining a safe and healthy working environment by providing all necessary safeguards and equipment required to reduce the potential for accidents and injuries.

Dogs and Other Pets at The Marine Mammal Center
- For the health and safety of both Center patients and domestic pets, pets (except service animals) are prohibited from being in and around Center buildings and public areas of the facility.
- Service animals, however, are allowed to enter the public areas of the Center only, and guests with service animals should be made aware that there is a risk to the animal being on premises, as it is possible for diseases of our marine mammal patients to be transmitted to them.
- Dogs may be kept on the front patio, but only with a responsible guardian present at all times.

Smoking Policy at The Marine Mammal Center
Smoking is not permitted at The Marine Mammal Center, with the exception of the parking lot for visitors and a designated space near the locker rooms for volunteers and staff.

Unexpected Guest Policy for Staff and Volunteers at The Marine Mammal Center
- As volunteers at the front desk, we serve as the reception area for guests and visitors meeting with staff and volunteers.
- After greeting them and asking for their name, please ask if they have an appointment or if the staff/volunteer is expecting them. Please confirm their name by asking for a photo ID.
  - If yes, please use the phone to call the staff person to notify them that their guest has arrived. If it is a volunteer, or if the staff person does not answer their phone, please use the radio to alert the point person.
  - If they do not have an appointment, please DO NOT call the staff or volunteer. Use the radio to alert the point person.

Receiving Mail at the Information Desk
- As volunteers at the front desk, we serve as the receiving area for incoming and outgoing packages each day
- When packages and mail arrive, volunteers should call the staff to notify them. Please use the phone list and instructions at the Information Desk for more details.

First Aid and Injuries
- Please use the radio immediately to alert the point person of any injury or accident. All injuries, ranging from trips to yellow jacket stings should be reported.
- Education staff can provide Band-Aids, ice packs and insect sting relief to visitors and assist if further first aid is needed.
- In case of serious injury, call 911.
- A copy of our Injury and Illness Prevention Program (IIPP) is available in the classroom and upon request for more details and our compliance with state and federal regulations.
Fire Alarms and Evacuation Plan

- In the case of a fire alarm, please alert visitors in your area (i.e. Information Desk, 2nd Level Viewing Area) that we do have to evacuate for safety reasons and gather in the parking lot for further directions. The staff point person will be the lead in providing instructions and guidance once outside.
- We will gather at the bottom of the main parking lot and wait along the sidewalk/hill (near the Harbor Seal Hospital) as Life Support Systems and Facilities team coordinate a response (and potentially wait for the Fire Department).
- Only once there is instruction from the staff point person should volunteers or visitors return to the Center.
- A copy of our Emergency Action Plan is available in the classroom and upon request for more details about emergency response.

Dress Code

- All volunteers should wear their TMMC name tag (either laminated or wooden) at all times when volunteering for the Education Department.
- Uniform clothing is required while on shift. Acceptable items include:
  - Designated blue vest (found at Information Desk)
  - Blue logo polo shirt (available to volunteers after completing 50 hours of service)
  - Youth crew t-shirt (provided to all youth volunteers during training)
  - TMMC Logo apparel
- All tour guides are required to wear blue logo polo shirt and wooden name tag.

General Volunteer Expectations

- Must act in accordance with our mission and core values
- Act in a professional and respectful manner
- Provide a welcoming environment for all volunteers, staff, and visitors
- Volunteers are expected to read all TMMC communications, including weekly education emails and Jeff Boehm’s Communique, as well as attend Education Volunteer Meetings and Trainings
- Engage with the Education Volunteer community to learn more about topics that interest you
- Seek feedback from your supervisors, accept suggestions for corrective changes in behavior and work to improve your performance
- Be prompt when reporting to work and with completing assignments
- Assert yourself and your ideas in an appropriate and tactful manner
- Be positive, supportive, fair, considerate, honest, trustworthy and cooperative when dealing with co-workers, volunteers, and visitors
- Only speak with media representatives on behalf of TMMC if instructed to do so directly by staff

Inappropriate Volunteer Conduct

- Any volunteer who does not comply with the above policies may receive a verbal or written warning from a supervisor.
- For egregious behaviors, or uncorrected behaviors, volunteers may be asked to leave the Education Volunteer, or The Marine Mammal Center volunteer, community.
Information Desk and Exhibit Hall

The exhibit hall is the first point of contact for guests to The Marine Mammal Center and one of two locations where education volunteers are typically stationed to interact with guests.

Docent’s Role

- Greet guests and orient them to the exhibitry and visiting options of The Marine Mammal Center
- Answer guest’s questions and help them have a memorable and enjoyable visit
- Register guests for guided tours using an iPad

Messaging

- Every guest is welcomed as they enter The Marine Mammal Center
- Please stand to greet every visitor
- Identify if the guests have been to the Center before. This will allow you to better judge their level of background and knowledge
- If guests have not been to the Center before:
  - Explain that we are the World’s largest marine mammal hospital and care for animals from over 600 miles of California coast
  - Our goal is to rescue and rehabilitate sick and injured seals, sea lions, dolphins and whales with the hope of releasing the animals back to the ocean with a second chance at life.
  - We are a non-profit, relying on donations to provide the life-saving care and nutrients to the patients
- Describe the various ways for each guest to experience the Center. Emphasize guided tours as the best way to visit the Center where appropriate.
  - Guided Tour
    - The best way to visit the Center. A 45-minute tour of the public areas of the hospital with an educator. Guests have the chance to participate in demos of how we rescue and feed patients while seeing the animals at the hospital
    - Offered every Monday and Friday at 1 and 3 pm, and Saturdays and Sundays at 11 am, 1 pm and 3 pm year-round
      - Tours offered daily at 11 am, 1 pm, and 3 pm during summer and high visitation periods
    - $10 for adults, $5 for seniors, children, and members
    - Free for new members that day and children under 4
  - Audio tour
    - A 45-minute tour with narration by staff, veterinarians and volunteers highlighting the public areas of the hospital
    - Available 10 am – 3 pm daily
    - Same pricing as Guided Tour
  - Self-Guided visit (maps available in different languages)
- If guests choose a self-guided visit:
  - Provide guests with a visitor map and mention there is a suggested $5 donation
  - Point out various areas of the hospital (i.e. fish kitchen, art exhibits, viewing level) and identify what animals they will have a chance to see on the 2nd level and why patients are at the hospital.
Resources Available

- Onsite Patient Catalog
  - A binder with stories and pictures of current patients onsite that is used to showcase animals at the hospital to guests

- Self-Guided Visitor Map
  - Map of the public areas of the hospital and information highlighting particular features of the facility
  - Guides are available in different languages: English, Spanish, French, German, Italian, Japanese and Chinese (Mandarin)

- Brochures and Information for the Public
  - Flyers and promotional materials displayed on the counter or on holders at the Information Desk and in a binder behind the desk (labeled “Handouts for the General Public”)
  - Visit Us and Membership Cards for guests inquiring about more information
  - Seafood Watch cards to allow guests to easily identify sustainable seafood options
  - Information for “how to become a volunteer” and “how to become a member”
  - Information on private tours, school field trips and Sea to School outreach programs
  - Information on where locally to see marine mammals in the wild

- Hospital Tour Binder (located on the shelf behind the Information Desk)
  - Graphics for interpretation:
    - Filtration System
    - Harbor Seal Hospital
    - Surgery Suite
    - Ke Kai Ola Hawaiian Monk Seal Hospital

- Patient Journey Binder (located on the shelf behind the Information Desk)
  - Graphics for interpretation:
    - Rescue/Triage
    - Admit
    - Rehabilitation
    - Release

- Guide to the Marin Headlands
  - Information and contact numbers for transportation in/out of the Marin Headlands
  - Hours and details about other visitor sites in Headlands (Visitor Center, Battery Townsley)
  - Hiking trail information

- Education Staff Point Person
  - Each day, one Education staff is dedicated to opening and closing the Center, and acting as a resource for volunteers onsite. They are accessible on the radio on Channel 5 at all times.
2nd Level Viewing Area

The 2nd level viewing area provides guests the best viewing of the Center’s patients and animal care practices and one of two locations where education volunteers are typically stationed to interact with guests.

Docent’s Role

- Connect guests with the patients they are observing and explain why patients are in our care
- Interpret animal behaviors and animal care procedures
- Answer guest’s questions

Messaging

- Greet visitors as they arrive to the 2nd level viewing area
- Explain why patients are at the hospital and how we are caring for them
  - Use similarities to human health to relate animal’s ailments and treatment plans to guests
- Identify species, age, and diagnosis of specific patients onsite
- Explain that our goal is to treat the patients and to release them back to the ocean with a second chance at life
- Encourage visitors to return to the Center again as the patients change frequently and seasonally

Resources Available

- What You Can See
  - The patients and volunteers themselves!
  - Filtration system
  - Pens and pools
  - Visible markers on the animals (i.e. flipper tags, grease markings, “party hats”)
    - Seals have flipper tags on their back flippers, sea lions are tagged on their front flippers
    - Males are tagged on their left flippers, females are tagged on their right flipper
  - Animal care equipment (i.e. herding boards, nets, carriers, orange heating pads)
- Onsite Patient Catalog
  - A binder with stories and pictures of current patients onsite that is used to showcase animals at the hospital to guests
- Resource Teaching Cart
  - Pelts of California sea lion and Northern elephant seal
  - Binoculars
  - Hat Tag and Flipper Tag
- Education Staff Point Person
  - Each day, one Education staff is dedicated to opening and closing the Center, and acting as a resource for volunteers onsite. They are accessible on the radio on Channel 5 at all times.
Gift Store

The gift store is a crucial aspect of the Center, providing revenue for the Center’s mission and allowing visitors to take either their first step, or next step, towards being an environmental steward.

The Products

The vast majority of the products sold in the gift store are environmentally friendly and provide good alternatives to the more standard, plastic-based products available.

- Reusable water bottles
- Reusable tote bags
- Children’s toys made from recycled materials
- Fair trade, organic snacks and drinks
- Jewelry made from recycled materials
- Books regarding environmental conservation

Books

The gift store features numerous books for both adults and children. Many of the books available feature patients from The Marine Mammal Center, including Honeygirl the Hawaiian monk seal, Astro the Stellar sea lion, Delta and Dawn the humpback whales, and Baker D the Bottlenose dolphin!

Discounts

Staff, volunteers, members, and visitors who participate in a guided tour or audio tour receive a 10% discount on items in the gift store (some restrictions apply).

Educational Features

The gift store also features numerous educational and engaging displays to allow the guest to continue their learning experience throughout the time they are onsite.

Live Mounts

The gift store features two taxidermied seals and sea lions. Guests have the chance to touch and engage with these real mounts and see what a one-year old California sea lion and a two-week old Pacific harbor seal look and feel like. These also make for wonderful photo opportunities for children and families.

Television

A television mounted in the gift store features videos of The Marine Mammal Center’s work and past patients, including releases of patients back to the ocean with a second chance at life.
Laboratory and Research

In-House Laboratory

We have a medical technologist on staff that tests samples from our patients to help our veterinarians diagnose ailments and to determine the best treatment plan. With a laboratory onsite, we are typically able to identify an animal’s ailments within 24-48 hours of their admit exam.

Samples collected include:

- Blood
  - Red blood cells (can identify anemia, trauma, malnutrition and dehydration)
  - White blood cells (can identify infection, pneumonia, liver disease and stress)
  - Eosinophils (can identify parasitic infection or exposure to toxins)
  - Blood urea nitrogen (can identify kidney disease)
- Urine (can identify infection or kidney damage)
- Feces (can identify parasitic infection or gastrointestinal distress)
- Genetics (for research purposes)
- Bacterial swabs (can identify specific infectious agents)

Research

We will perform a necropsy on every patient that is euthanized or passes away to identify the cause of death and take samples for our research database and other research projects. Each year, The Marine Mammal Center collaborates and participates in 20-40 studies with organizations around the World. Every patient that passes away contributes to at least one research project, but some may contribute to 10 or more.

Major Findings

- In 1979, The Marine Mammal Center was the first organization to discover cancer in California sea lions.
- In 1998, The Marine Mammal Center was the first organization to identify domoic acid in marine mammals and to develop a treatment plan to rehabilitate and release poisoned animals.
- Research findings help provide clues for marine mammal health, but also other marine species (ranging from fish to terrestrial animals) and have human health implications (domoic acid toxicosis, leptospirosis, etc...)

Examples of Research Projects
(lead organization in parenthesis)

- Hippocampus damage in domoic acid patients to help understand temporal lobe epilepsy in humans (Stanford University School of Medicine)
- Skin for genetics (The Marine Mammal Center)
- Tooth for aging (The Marine Mammal Center)
- Tumor for genetics (North Carolina State University)
- Urine and kidney for Leptospira cultures (Center for Disease Control)
- Heartworm study (University of California, Santa Cruz)
- Parasite identification (University of Spain)
- Brain Hypoxia (University of California, San Francisco)
Pens/Pools and Filtration System

The Marine Mammal Center has 55 total pens/pools for patients and the Center has cared for over 290 animals at one time. In total, the pools hold a total of over 250,000 gallons of water!

Pens and Pools

Species-specific pens and pools for animals of different sizes and health:
- **In-ground pools (4 feet deep, 887 gallons):** Used for harbor seals and elephant seals to allow for easy access to the water. Pools have various levels of depths to allow animals to both rest in the water and dive deeply.
- **Above-ground pools (5 feet deep, 2243 gallons):** Used for sea lions to allow for the animals to climb and rest on the sides of pools.
- **Isolation Units (“Condos”):** Used for harbor seal and neonate patients to allow for climate-controlled, isolated spaces for critical patients. These are located in the harbor seal hospital.
- **Large in-ground pools (“H Row”) (6 feet deep, 9335 gallons):** Used for pre-release patients to allow deep diving and for open ocean animals like fur seals who prefer greater space to swim.

Filtration System

- We buy water for our pools from the city of Sausalito.
- We add salt to it (approx. half the salinity of ocean water, 15 parts per million) and monitor the water closely for salinity and levels of bacteria.
- Temperature of the water is ambient (approx. 60 degrees), so slightly warmer than ocean water off the California coast.
- We reuse the majority of the pool water (approx. 80%) by cleaning it through an automated filtration system that involves removing organic matter and oils as well as killing bacteria, viruses and parasites before returning clean water to the pools.
- We use ozone gas to destroy bacteria and inactivate viruses.
- The water treatment cycle takes about 15 to 20 minutes to completely turnover the water in a pool! This process occurs continuously throughout the day and night.
Our Satellite Facilities

The Marine Mammal Center has 3 other physical sites along the coastline and Hawaii to ensure any marine mammal found within our rescue range can be rescued in an efficient way and transported to the hospital headquarters in Sausalito. Only the facility in Hawaii and headquarters in Sausalito are open to the public for visitation.

Given the natural behaviors and ranges of seals and sea lions in California, our satellite facilities are responsible for rescuing a majority of patients admitted to the hospital in Sausalito. The regions are responsible for rescuing the animals, providing food and medical care to the patients and participate in outreach education in their respective areas.

San Luis Obispo Operations (SLO), located in Morro Bay
- Approximately 100 volunteers and 2 staff people coordinate and rescue animals throughout San Luis Obispo County
- Historically, approximately 20% of all of The Marine Mammal Center’s patients have been rescued from San Luis Obispo County. The number of animals rescued by SLO operations varies each year, but could range from 100 to 430 animals each year!
- Animals can be kept overnight (or for a few days) in pens to allow for the patient’s condition to stabilize before transport to the Sausalito hospital
- Participate in 15-30 educational fairs, training classes and events each year, reaching thousands of people each year with ocean health, marine mammal and Center messaging

Monterey Bay Operations (MBO), located in Moss Landing
- Approximately 70 volunteers and 2 staff people coordinate and rescue animals throughout Monterey and Santa Cruz Counties
- Historically, approximately 43% of all of The Marine Mammal Center’s patients have been rescued from Monterey and Santa Cruz County. The number of animals rescued by MBO operations varies each year, but could range from 200 to 650 animals each year!
- Animals can be kept overnight (or for a few days) in pens to allow for the patient’s condition to stabilize before transport to the Sausalito hospital
- Participate in 15-30 educational fairs, training classes and events each year, reaching tens of thousands of people each year with ocean health, marine mammal and Center messaging

Anchor Bay & Fort Bragg (ABO and FBO, respectively), located in Mendocino County
- While there is no physical location for our rescue operations in our northern part of our rescue range, a team of dedicated volunteers do possess vehicles to allow for quick response and rescue of patients. All rescued animals are then immediately brought to the Center in Sausalito for care.
- Historically, approximately 2% of all of The Marine Mammal Center’s patients have been rescued from Mendocino County

Ke Kai Ola (“The Healing Sea”), located on the Kona coast of the Big Island, Hawaii
- In September 2014, The Marine Mammal Center opened a new state-of-the-art hospital and visitor center for Hawaiian monk seals in Hawaii, which provides a facility to allow for the rescue, rehabilitation and release of sick and hurt monk seals on the islands.
- Our facility in Hawaii provides care to patients independently of the Sausalito hospital and has the ability to hold and care for up to 10 monk seals at a time.
- Since 2014, the Center has cared for 2% of the entire Hawaiian monk seal population!
Introduction to Animal Care Procedures

Similar to a human hospital, our veterinarians and volunteers can provide state-of-the-art medical care to our marine mammal patients. Essentially any test you can receive at a human hospital, ranging from surgery to x-rays to brain scans can be performed onsite (with the exception of MRIs and CT Scans).

Animal Care Crews

- 4 crews per day
  - Day and night crew for California sea lions and elephant seals ("Topside")
  - Day and night crew for harbor seals (due to specialized care needed)

Basic Guideline

- In order to keep the patients wild, volunteers and veterinarians limit interaction, including contact with the animals and noise in the animal care areas, unless necessary for medical care procedures

Equipment Used

- Slickers, boots and gloves to prevent spread of disease
  - Volunteers will wear heavy-duty foul weather gear to act as protective clothing that can be cleaned and disinfected easily
  - Volunteers will wear either latex or reusable pink Casa Bella gloves when performing animal care procedures and in fish kitchen

- Herding boards
  - Wooden, or reinforced plastic, boards used for protection (i.e. shields) and to guide animals in particular directions

- Nets
  - Used to catch animals during rescue and to remove animals from the water in the case of weighing, release or other medical care procedures

- Foot Baths
  - Black mats filled with Accel, a disinfectant, line the hallways and are found outside of each pen
  - Volunteers will step in disinfectant and brush down slickers and boots after entering a pen to prevent any cross contamination of germs between animal pens and from animal pens to public areas

- Subcutaneous fluid bags (sub-Qs)
  - Similar to an IV, fluids are used to hydrate animals that are malnourished
  - The needle is placed in the blubber layer under the animal’s skin near their shoulder blades
  - Volunteers occasionally will use metal fencing to enclose an animal or stand with an animal during the process to ensure the needle stays in an animal throughout the process.
Rescue and Release

Each year, The Marine Mammal Center rescues an average of 600-800 animals, making the Center the world’s largest marine mammal hospital by volume.

Rescue

We rescue patients from over 600 miles of California coastline, from Mendocino County to San Luis Obispo County, including areas within San Francisco Bay and the Sacramento Bay. To ensure a quick response to any sick or hurt marine mammal in our rescue range, we have 5 satellite regions along the coastline and Hawaii:

- San Luis Obispo Operations (SLO), located in Morro Bay
- Monterey Bay Operations (MBO), located in Moss Landing
- Anchor Bay (ABO)
- Fort Bragg (FBO)
- Ke Kai Ola (“The Healing Sea”), located on the Kona coast of the Big Island, Hawaii

What is considered a stranded marine mammal?

All marine mammals are protected by federal law dating back to 1972 with the Marine Mammal Protection Act. The law established the Marine Mammal Stranding Network, consisting of over 400 agencies across the country to evaluate marine mammal health, and, in some cases, rehabilitate and release sick and injured animals. Our rescue work is regulated by the National Marine Fisheries Service.

A full list of marine mammal rescue organizations can be found in the Resources and Teaching Tools Binder at the Information Desk.

According to the Marine Mammal Protection Act, a stranded marine mammal is:

- Any dead marine mammal on the shore or in the water
- A live marine mammal on the shore and unable to return to the water and/or in need of medical attention
- A live marine mammal in the water but unable to return to its natural habitat on its own

How do we find a sick animal?

- We depend on the public to notify us of any animal that is injured, sick, in need of help, or in an unusual location
- We have a 24-hour hotline (415-289-SEAL) for anyone to report an animal stranded or in distress. We assess the situation and dispatch a rescue team if necessary.
- Our standard rescue equipment includes a carrier (sized to fit the animal and minimize stress), herding boards, various nets and a pick-up truck or van for transport.
Are there any places we can’t rescue animals?

Our first priority is the safety of our volunteers and staff. We will never endanger people to rescue an animal. This could include rescues on docks/piers with other animals, rescues at night and unsafe rocks and beaches.

We are also not permitted to enter a rookery (marine mammal breeding ground) during mating/pupping season to rescue a sick or injured animal without special permission from the National Marine Fisheries Service. Due to the risk of disturbing many healthy animals in order to rescue one individual, those areas are deemed areas where nature must take its course, unless there is an extenuating circumstance.

Release

Our ultimate goal for all of our patients is to release them back to the ocean with a second chance at life. Each year, typically hundreds of animals are able to be successfully rehabilitated and released back to the ocean.

Where do you release the animals?

Animals are typically not released where they are found, as they are generally found in unsafe locations, such as public beaches, road ways, and outside of their natural habitat. When we release the animals, we bring them to safe areas which serve as good re-entry points for the patients to acclimate to the wild. Almost all releases are done privately and not available to the public. Some release sites include:

- Chimney Rock (Pt. Reyes)
- Fitzgerald Reserve (San Mateo)
- Bodega Bay
- Rodeo Beach (specific to large sea lions)
- In special circumstances, we release animals near the Farallones or Channel Islands by boat (Northern fur seals, Guadalupe fur seals, young sea lion pups)

How many animals don’t make it?

Our success rate varies greatly by species and year. Historically, our success rate is just under 50% for all species. Elephant seals typically have the best success with over 75%, and sea lions and harbor seals closer to 50% as they are frequently rescued in extremely fragile states or suffering from diseases that are not treatable. In 2013, we tied for our highest overall success rates for all species at 61% and recorded our best ever success rate for Harbor Seals at 86%.

Do you tag the animals when you release them?

Every animal that is admitted to the hospital in Sausalito is given a flipper tag with a unique number. The orange flipper tag remains with them their entire lives providing a visual reference while the animal is at the hospital and if the animal is ever re-sighted in the wild or becomes re-stranded and in need of medical attention. Sea lions and fur seals are tagged on the front flippers, while seals are tagged on the back flippers. Males are tagged on the left flipper and females are tagged on the right. We have been able to identify animals years later using flipper tags and have even seen animals we cared for as pups go on to have pups of their own, like Shamrock the elephant seal and Eagle the harbor seal. Radio tags and satellite tags can also be used to track animals, but due to their high cost (satellite tags can cost upwards of $5,000 each) are used only under special circumstances.
# A “Typical” Day in the Life of an Animal Care Volunteer

## Day Crew

<table>
<thead>
<tr>
<th>Time (approximate)</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - 6:30 AM</td>
<td>Volunteers arrive and begin looking through animal charts</td>
</tr>
</tbody>
</table>
| 6:30 - 8 AM        | Prepare feeds for animals (weighing and sorting fish)  
|                    | Prepare medications  
|                    | Add disinfectant to footbaths |
| 8 - 9:30 AM        | Feed animals (could be free feeding or tube feeding)  
| 9:30 - 1 PM        | Assist veterinary staff with admit exams, release exams, and medical procedures  
|                    | Chart results of animal feedings and behaviors  
|                    | Clean animal pens  
|                    | Clean dishes  
|                    | Provide subcutaneous fluids to critical patients  
|                    | Prepare feeds for afternoon  
|                    | Make formula for patients  
|                    | Fish school |
| 1 PM               | Volunteers take a much needed and deserved lunch |
| 2 PM               | Feed animals (could be free feeding or tube feeding) |
| 3:30 – 5:30 PM     | Chart results of animal feedings and behaviors  
|                    | Clean dishes/kitchen |

Note: timing varies dramatically by crew and number of patients onsite. Additional feedings occasionally occur for critical patients at 12 PM and 4 PM.

## Night Crew

<table>
<thead>
<tr>
<th>Time (approximate)</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:30 - 7 PM</td>
<td>Volunteers arrive and begin looking through animal charts</td>
</tr>
</tbody>
</table>
| 7 - 8 PM           | Prepare feeds for animals (weighing and sorting fish)  
|                    | Prepare medications  
|                    | Make formula for patients |
| 8 - 9 PM           | Feed animals (could be free feeding or tube feeding) |
| 9 - 10:30 PM       | Clean animal pens  
|                    | Clean dishes  
|                    | Provide subcutaneous fluids to critical patients  
|                    | Sort and weigh fish for morning feed |
| 10:30 – 11 PM      | Chart results of animal feedings and behaviors  
|                    | Clean dishes/kitchen |

Note: timing varies dramatically by crew and number of patients onsite. Additional feedings occasionally occur for critical patients at 10 PM and 12 AM.
Feeding

One of the most important aspects of rehabilitation is providing food and nutrients to the patients. We feed our patients Pacific Herring (caught using purse seine nets from Alaska, a “Good Alternative” according to Seafood Watch). The fish is sent in frozen where volunteers will thaw and separate fish each day. On a busy day, we could use up to 1,000 pounds a fish and over the course of a year use between 60,000-90,000 of fish!

Feeding times vary, but generally breakfast, lunch and dinner are served around 8am, 2pm and 8pm, with additional feedings for critical patients. Pups are tube-fed 3-5 times a day. Most animals are offered 5-10% of body weight daily, but may start on much lower amounts when admitted. Veterinary staff directs all feeding protocols.

Tube Feeding

- For patients that are too young, or unable to eat fish on their own, we create a formula that is given to the animals through tube feeding.
  - The formula varies by species and patient’s age, but consists mostly of ground herring, water, salmon oil, and occasionally a powdered milk matrix
  - The formula is put into a large syringe and volunteers use a tube to administer the formula directly into the animal’s stomach
  - It requires minimally two people: one restrains the animal by using their knees to pin the animal on the pen floor, while another inserts the tube into the animal’s mouth and into the stomach. Both volunteers will check to ensure the tube is in the stomach before administering any formula.
  - This method is a last resort and only used for smaller animals that cannot eat fish on their own

Fish School

- For many elephant seal and harbor seal pups rescued, they are so young that they do not know how to eat fish. Volunteers must teach the pups how to track and position fish.
  - Volunteers will attach a fish to a string, or use tongs, to entice pups to follow or bite the fish. With increased exposure, the animals typically become curious and being playing and eating the fish.

Free Feeding

- This is the preferred method of feeding.
  - Volunteers weigh out specific amounts of whole fish for each patient and group animal’s feeds into buckets.
  - Fish is thrown into the animal’s pools and animals must eat fish on their own, while competing with their pen mates.
  - Animals are grouped by age, size and feeding ability to ensure that each animal gets the appropriate amount of food.
  - This method allows the animals to keep their naturalistic instincts, as opposed to associating people with food, and prepares the animals for life in the ocean once released.
Malnutrition (California Sea Lions)

What is it?
Malnutrition is a state of dehydration and being underweight

Seasonality:
Seen in all age classes, but most frequently in pups (ages 7-11 months) and yearlings (1-2 years old) in the spring and summer. Pups are born in Southern California and Mexico in June and many arrive in our rescue range after 7 months old severely underweight (typically half of their ideal weight).

Causes:
It is impossible to identify the cause for each animal, but an animal’s inability to find food on their own might be due to poor swimming ability, lack of fish in the area, separated from mother before becoming sufficient hunters, or other reasons.

Symptoms:
1) Very underweight and dehydrated
2) Extremely lethargic
3) Frequently you see malnutrition and pneumonia occurring at the same time

Treatment:
Many of the animals rescued are so weak they cannot, or will not, eat fish on their own.
- Offer fish to animals, and slowly increase the amount of food throughout the animal’s stay
- If not eating, tube-feed animals a formula involving ground herring, salmon oil and water
- Administer subcutaneous fluids
- Medications if needed to combat parasites, pneumonia or other secondary medical problems
- Rehabilitation ranges between 4-8 weeks, as the animal reaches a suitable release weight.

Messaging At The Marine Mammal Center:
- These young sea lions are very sick and must be kept in the back pens during the recovery process to ensure a quiet environment and to reduce the risk of habitation to people.
- We can help ensure there are plenty of fish in the ocean by buying only sustainable seafood. The Marine Mammal Center is an official partner of the Bay Area Sustainable Seafood Alliance and the Monterey Bay Aquarium Seafood Watch program. Visitors can download the free Smartphone App, or take a seafood watch guide (we have versions for fish and sushi) from the Information Desk to help them make sustainable seafood decisions.
  - When buying seafood, always ask the retailer, “do you sell sustainable seafood” and only purchase items on the Best Choices or Good Alternatives section of Seafood Watch.
  - At The Marine Mammal Center, we try to use only sustainable seafood by purchasing Pacific herring from Alaska (a “Good Alternative” according to Seafood Watch).
- If you see an animal on the beach, please don’t approach it! Call The Marine Mammal Center rescue hotline at 415-289-SEAL (7325).
Maternal Separation and Malnutrition (Elephant Seals)

What is it?
We can identify elephant seal’s ages by the color of their fur. Elephant seals are born with a thick black fur they keep for 1 month while they stay with their mothers (referred to as blackcoats). After one month, they molt (shed) their fur and get a silver fur (known as weaned pups or weaners). Any blackcoat elephant seal should be with its mother. Some elephant seals can be separated from their mother’s prior to that full one month.

Elephant seals are born weighing 75 pounds and within one month reach 300 pounds by drinking their mother’s milk. Typically, elephant seals are rescued at 1-6 months old only weighing 75 pounds (200 pounds underweight!)

Seasonality:
All elephant seals are born between December & February. Elephant seal pups separated from their mothers are typically rescued between January & March, while animals rescued between March & August typically suffer from malnutrition.

Causes:
Big storms have been known to wash young elephant seal pups off the beaches and into the ocean unable to swim well or hunt, eventually leading them to strand malnourished on nearby beaches.

In the wild, elephant seals must learn how to swim, hunt and eat fish on their own. Some pups fail to learn these techniques on their own, while others are unable to find sufficient found in the wild, resulting in them stranding on beaches malnourished and underweight.

With rising sea level, there is potential for popular breeding beaches to get smaller and more susceptible to big storms.

Symptoms:
1) Very underweight and dehydrated
2) Extremely lethargic
3) Frequently you see malnutrition, parasites and pneumonia occurring at the same time

“Normal” one-to-two month old elephant seal in the wild

One-to-two month old elephant seal admitted to The Marine Mammal Center
**Treatment:**
Many of the animals rescued are so weak they cannot, or do not know how to, eat fish on their own.
- If not eating, tube-feed animals a formula involving ground herring, salmon oil and water
- Animals will go to “fish school”, where volunteers try to teach them how to track, position and swallow fish
- Offer fish to animals, and slowly increase amount of food throughout animal’s stay
- Subcutaneous fluids
- Medications if needed to combat parasites, pneumonia, or other secondary medical problems
- Rehabilitation ranges between 2-4 months, as the animal learns to eat fish and reaches a suitable release weight

**Messaging At The Marine Mammal Center:**
- Elephant seals are our second most common patient at the hospital and every Spring we see large numbers of pups suffering from malnutrition (peak number onsite is typically mid-April and could reach up to 125 animals onsite at one time)!
- Elephant seals between 1-6 months old should weigh close to 300 pounds (approximately the size of a NFL football player), but when rescued, they weigh close to 75 pounds, 200 pounds lighter than what they should weigh!
- If you see an animal on the beach, please don’t approach it. Call The Marine Mammal Center rescue hotline at 415-289-SEAL (7325).
- With rising sea level, there is potential for their popular breeding beaches to get smaller and more susceptible to big storms. We can help prevent sea level rise, by reducing our use of fossil fuels like coal, oil, and natural gas which act as a blanket in the atmosphere, trapping heat and causing air and water temperature to warm and expand.
- We can help ensure that there is plenty of fish in the ocean by buying only sustainable seafood. The Marine Mammal Center is an official partner of the Bay Area Sustainable Seafood Alliance and the Monterey Bay Aquarium Seafood Watch program. Visitors can download the free Smartphone App, or take a seafood watch guide (we have versions for fish and sushi) from the Information Desk to help them make sustainable seafood decisions.
  - When buying seafood, always ask the retailer, “do you sell sustainable seafood” and only purchase items on the Best Choices or Good Alternatives section of Seafood Watch.
  - At The Marine Mammal Center, we try to use only sustainable seafood by purchasing Pacific herring from Alaska (a “Good Alternative” according to Seafood Watch).
Maternal Separation and Malnutrition (Harbor Seals)

What is it?
Harbor seal pups can become separated from their mothers or be unable to find food on their own and become malnourished.

Seasonality:
All harbor seals are born in the spring. Harbor seal pups rescued range between 1 day-3 months and are rescued between March-June

Causes:
Harbor seals can be separated from their mothers due to big storms or people and/or dogs on the beach harassing the mother and the pup. Harbor seal mothers are very skittish and therefore will abandon their pups if people or dogs get too close to the young pup.

Symptoms:
The vast majority of harbor seals rescued each year are less than 2 weeks old and are extremely fragile.
    1) Very underweight and dehydrated
    2) Extremely lethargic
    3) Umbilical cord infections
    4) Dog bite wounds (from animals out on the beach)

Treatment:
All harbor seals will be treated in the harbor seal hospital to provide a sterile, quiet and undisturbed area for rehabilitation.
    • Harbor seals less than 2 weeks old should be nursing and are therefore tube-fed a formula of salmon oil, milk matrix and water.
    • Animals will go to “fish school”, where volunteers teach them how to track, position and swallow fish.
    • Offer fish to animals, and slowly increase amount of food throughout animal’s stay.
    • Medications if needed to combat parasites, pneumonia, or other secondary medical problems.
    • Rehabilitation ranges between 2-4 months, as the animal learns to eat fish, compete with other animals for food and reaches a suitable release weight.

Messaging At The Marine Mammal Center:
    • Harbor seals are our third most common patient at the hospital and every Spring we see large numbers of pups suffering from maternal separation (peak number onsite is typically mid-May and could reach up to 60 animals onsite at one time).
    • If you see an animal on the beach, please don’t approach it. Call The Marine Mammal Center rescue hotline at 415-289-SEAL (7325).
    • Please keep dogs on leashes while at beaches during the Spring to avoid any negative interactions between dogs and seals.
Malnutrition (Fur Seals)

What is it?
Malnutrition is simply a state of dehydration and being underweight.

Seasonality:
Northern fur seals: Typically seen in 4-6 month old pups (October-December)
Guadalupe fur seals: Typically seen in 8-11 month old pups (March-June)

Causes:
It is impossible to identify the cause for each animal, but an animal’s inability to find food on their own might be due to poor swimming ability, lack of fish in the area, separated from mother before becoming sufficient hunters, or other reasons.

Symptoms:
1) Very underweight and dehydrated
2) Extremely lethargic

Treatment:
Many of the animals rescued are so weak they cannot, or will not eat fish on their own.
- Offer fish to animals, and slowly increase amount of feed throughout animal’s stay
- If not eating, tube feed animals a formula involving ground herring, salmon oil, and water
- Subcutaneous fluids
- Medications if needed to combat parasites, pneumonia, or other secondary medical problems
- Rehabilitation ranges between 7-12 weeks, as the animal reaches a suitable release weight.
- Most Guadalupe fur seals will receive a satellite tag upon release to monitor their migration.

Messaging At The Marine Mammal Center:
- These young fur seals are very sick and must be kept in the back pens during the recovery to ensure a quiet environment and to reduce the risk of habitation to people.
- We can help ensure there is plenty of fish in the ocean by buying only sustainable seafood. The Marine Mammal Center is an official partner of the Bay Area Sustainable Seafood Alliance and the Monterey Bay Aquarium Seafood Watch program. Visitors can download the free smartphone App, or take a seafood watch guide (we have sushi and fish) from the Information Desk to help them make sustainable seafood decisions.
  - One thing while buying seafood, always ask the retailer, “Do You Sell Sustainable Seafood” and only purchase items on the Best Choices or Good Alternatives section of Seafood Watch.
  - At The Marine Mammal Center, we try and use only sustainable seafood by purchasing Pacific herring from Alaska (a “Good Alternative” according to Seafood Watch).
- If you see an animal on the beach, please don’t approach it and call The Marine Mammal Center.
Maternal Separation, Malnutrition and Other Ailments  
(Hawaiian Monk Seals)

What is it?
Hawaiian monk seals are only found around the Hawaiian Islands and are cared for at Ke Kai Ola, a Marine Mammal Center hospital in Kona, Hawaii. Monk seals are rescued from all of the Hawaiian Islands by partner agencies, such as NOAA, and transported by plane or boat to the hospital for treatment.

We can identify a Hawaiian monk seal’s age by the color of their fur. Hawaiian monk seals are born with a thick black fur they keep for one month while they stay with their mothers (referred to as blackcoats). After one month, they molt (shed) their fur and get a silver fur (known as weaned pups or weaners). Any blackcoat monk seal should be with its mother. Some monk seals can be separated from their mother’s prior to that full one month.

Hawaiian monk seals are born weighing 35 pounds and within one-month reach 200 pounds by drinking their mother’s milk. Typically, monk seals are rescued at 1-3 months old only weighing 35 pounds (170 pounds underweight!)

Seasonality:
Hawaiian monk seals are born year-round, with most pups being born in late March and early April. Due to limitations with getting to the Northwest Hawaiian Islands, rescues and releases are dictated by NOAA Research Vessels going to and from the islands. Typically, NOAA does a trip in the Spring, resulting in 1 month old pups being rescued and brought to the Center. NOAA also typically does a trip in the summer/fall, allowing us to return those pups to the Northwest Islands healthy and pick up additional malnourished (and typically a few month older monk seals) and bring them back to the hospital.

Causes:
With rising sea level, 50% of the historic monk seal breeding beaches are already underwater. With the limited beach space, big storms have been known to wash young monk seal pups off the beaches and into the ocean unable to swim well or hunt, eventually leading them to strand malnourished on nearby beaches.

In the wild, monk seals must learn how to swim, hunt and eat fish on their own. Some pups fail to learn these techniques on their own, while others are unable to find sufficient found in the wild, resulting in them stranding on beaches malnourished and underweight.

Less than one in five seals survive to reproductive age due to threats such as malnutrition. Competition amongst sharks and large fish is limiting young pup’s ability to acquire enough fish and nutrients for survival.

The Northwest Hawaiian Islands, despite no human settlements, are also home to significant amounts of plastics due to the ocean currents gathering ocean trash on to the islands. Young pups are often very curious and can become entangled in or ingest trash by accident.

Symptoms:
1) Very underweight and dehydrated 
2) Extremely lethargic 
3) Frequently you see malnutrition, parasites and pneumonia occurring at the same time
**Treatment:**
Many of the animals rescued are so weak they cannot, or do not know how to, eat fish on their own.
- If not eating, tube-feed animals a formula involving ground herring, salmon oil and water
- Animals will go to “fish school”, where volunteers try to teach them how to track, position and swallow fish
- Offer fish to animals, and slowly increase amount of food throughout animal’s stay
- Medications if needed to combat parasites, pneumonia, or other secondary medical problems
- Volunteers will hide fish amongst various enrichment devices (fish frozen in an icicle, a feeder box requiring seals lifting up rocks, etc…) to encourage appropriate feeding behavior
- Rehabilitation ranges between 3-9 months, as the animal learns to eat fish and reaches a suitable release weight, and timing with a NOAA Research Vessel traveling to the Northwest Hawaiian Islands

**Messaging At The Marine Mammal Center:**
- The Hawaiian monk seal is the most endangered sea or sea lion in the United States
- The Marine Mammal Center took their 40 years of experiencing saving marine mammals in California and opened a hospital in Kona, Hawaii to save the species. Since 2014, the Center has already rehabilitated over 2% of the entire monk seal population!
- The Hawaiian monk seals receive similar care as the elephant seals in Sausalito, in an effort to have them gain weight and learn how to eat fish on their own.
- If you see a monk seal on the beach in Hawaii, please don’t approach it. Call the Ke Kai Ola rescue hotline at 808-987-0765.
- With rising sea level, there is potential for their popular breeding beaches to get smaller and more susceptible to big storms. We can help prevent sea level rise, by reducing our use of fossil fuels like coal, oil, and natural gas which act as a blanket in the atmosphere, trapping heat and causing air and water temperature to warm and expand.
- Despite their location in Hawaii, simple actions wherever you live or work can be taken to help save monk seal lives:
  - Plastic lasts forever, so one of the most successful ways to help seals and sea lions is to reduce your use of plastic by using reusable canvas bags, reusable water bottles and eliminating the use of single-use plastic
  - Any trash that is up on land can get out to the ocean through the wind, sewers and waterways, so no matter where you live, you can help save animals by picking up trash and reusing as much as possible
- We can help ensure that there is plenty of fish in the ocean by buying only sustainable seafood. The Marine Mammal Center is an official partner of the Bay Area Sustainable Seafood Alliance and the Monterey Bay Aquarium Seafood Watch program. Visitors can download the free Smartphone App, or take a seafood watch guide (we have versions for fish and sushi) from the Information Desk to help them make sustainable seafood decisions.
  - When buying seafood, always ask the retailer, “do you sell sustainable seafood” and only purchase items on the Best Choices or Good Alternatives section of Seafood Watch
Domoic Acid Toxicosis (DA)

**Primary Species Affected:**
California sea lions (also observed in small numbers with fur seals, otters, dolphins and whales)

**Seasonality:**
Typically seen in the fall with adult female and male California sea lions. May also be seen in warmer than average seasons.

Patient count varies dramatically by year. Some years, the Center treats less than 30 cases, and other years over 150 cases. Animals are typically rescued from San Luis Obispo and Monterey counties.

**Description:**
Domoic acid is a neurotoxin produced by phytoplankton, specifically a microscopic diatom (*Pseudonitzschia australis*) in the ocean. Similar to “Red Tide”, this neurotoxin builds up the food chain (toxic algae is eaten by fish which are then eaten by sea lions). Only animals at the top of the food chain are affected by this toxin as it is required in high quantities to cause symptoms.

**Causes:**
The toxin is only released when the algae bloom, and there are many causes for algae blooms. Increased water temperatures, fertilizer runoff into coastal waters, and ocean acidification are all causes for increased algae blooms, but not necessarily the only factors involved.

The cause for increased frequency of algae blooms remains unknown, and requires additional research.

**Symptoms:**
The effects of domoic acid on sea lions depend upon the amount of the toxin in their body.

Symptoms may include:
1) Disorientation
2) Seizures, similar to epilepsy in humans
3) Weakening of the heart muscle (cardiomyopathy)
4) Brain damage (in severe causes). The toxin affects the hippocampus of the brain (responsible for navigation and memory) and can atrophy (or shrink) that area of the brain.
**Treatment:**

For acute cases (there is no brain damage):
- Subcutaneous fluids are used to flush the water-soluble toxin out of the animal’s body
- Anti-seizure medications, such as Phenobarbital, are used to control the seizures
- Rehabilitation ranges between 1-6 weeks, as the animal flushes the toxin and reaches a suitable release weight

For chronic cases (the hippocampus is damaged) due to repeated exposure:

- Currently there is no treatment for the brain damage. The animal will be euthanized, as they cannot survive with the brain damage.

**Current Research:**

- Identifying the root causes of increases in harmful algae blooms
- Long term effects of small amounts of domoic acid on sea lion health
- Identifying new methods for determining brain damage due to domoic acid without the use of expensive MRIs

**Important Notes:**

- The Marine Mammal Center was the first in the World to diagnose domoic acid in marine mammals after a large number of sea lions suffering from the toxin were rescued in 1998.
- Domoic acid toxicosis can also affect humans (we eat the same fish that sea lions do!). It is called Amnesiac Shellfish Poisoning and was first reported in 1987 when 4 people died after eating infected mussels.
  - Due to the need to accumulate a lot of the toxin, it is more likely for humans who ingest high quantities of shellfish (mussels, clams, etc...) than fish in a single setting.
- When animals with domoic acid are rescued, the Center contacts the National Marine Fisheries Service and the California Department of Public Health. The fisheries are closely monitored, and sometimes closed, to ensure humans are not eating contaminated seafood (this happened in 2015 resulting in the closure of the Dungeness Crab Fishery, among others, in California).
- The toxin can be passed through the placenta during pregnancy which sometimes results in The Marine Mammal Center rescuing abandoned pups that suffer from the toxicity and females aborting fetuses during pregnancy.

**Messaging At The Marine Mammal Center:**

- Sea lions and sea otters are sentinels for ocean health. By rescuing them, we not only save their lives, but also identify changes to the health of the ocean and ensure that humans are safe from eating contaminated seafood.
- Luckily for many of the animals, we are able to treat domoic acid, and thus release healthy animals back to the ocean.
- Reducing our use of fertilizers and fossil fuels can help prevent harmful algae blooms in the future.
- In 2014, The Marine Mammal Center partnered with the California College of the Arts Animation Department to create an animated short highlighting domoic acid. The video is available on video monitors around the Center and our website.
Leptospirosis (Lepto)

**What is it?**
Leptospirosis is caused by a bacterium (Leptospira) that affects the kidneys of infected animals.

**Primary Species Affected:**
California sea lions (it has been observed in other pinnipeds and marine mammals though)

**Seasonality:**
Typically seen in the fall with juvenile male California sea lions.

Patient count varies dramatically by year with some having less than 5 cases, and others with over 150 cases. Animals are typically rescued from Monterey and Bay Area counties. Large outbreaks are observed typically every 3-5 years.

**Causes:**
Leptospira is a natural bacterium and can be spread through urine, blood and other bodily fluids (or water that has been contaminated by those fluids). Given sea lions’ very social behavior and their tendency to group in large numbers, the potential for the spread of the bacteria is very high.

**Symptoms:**
Dependent upon the degree and length of exposure to the Leptospira bacteria.

1) Severe dehydration (animal will be observed trying to drink ocean water)
2) Abdominal pain
3) Seizures, similar to epilepsy in humans
4) Kidney damage (in severe cases, kidney failure and death are possible)

**Treatment:**
For acute causes:
- Antibiotics, such as *Ceftiofur*
- Subcutaneous fluids to hydrate the animal
- Rehabilitation ranges between 3-8 weeks, as the animal flushes the bacteria, regains hydration and reaches a suitable release weight

For chronic causes (the animal has kidney failure):
Currently there is no treatment for an animal with significant kidney damage (greater than 2/3 of the kidney). The animal will pass away shortly after rescue or will be euthanized.
Current Research:
- Research suggests that the bacteria has actually adapted to sea lions and may be shed through "carriers," or sea lions that are not outwardly suffering from leptospirosis, but are continuing to shed the bacteria through urine, thus infecting more sea lions.
  - We routinely sample wild sea lions in the Bay Area and breeding areas in Southern California to better understand the prevalence of the strain.
- Identifying the cause for the cyclical pattern of outbreaks (every 3-7 years)
- Identifying the DNA of this particular strain and of the strains that affect other marine mammals.
- Improving treatments that can treat infected patients

Important Notes:
- Leptospirosis is a bacterial disease of global importance and can infect all mammals, including humans.
- Leptospirosis is known as a zoonotic disease, meaning it can be spread across species
- Leptospirosis is highly contagious and is commonly seen in rats, dogs and humans (many dogs are actually vaccinated for leptospirosis)
- Leptospirosis is a major disease seen around the World with over 1 million people impacted each year. Outbreaks are common in areas where water filtration systems are poor or lacking and result in people drinking unfiltered water from streams, lakes, or ponds.
- Data collected in collaboration with researchers at UCLA and the National Marine Mammal Laboratory indicates that animals in the central part of the sea lion range (Point Conception up to Mendocino County) are more likely to be infected than those in the southern part of their range (the California Channel Islands) where the sea lions have their rookeries.

Messaging At The Marine Mammal Center:
- Sea lions are mammals like us and suffer from many of the same diseases that affect people.
- Luckily for many of the animals, we are able to treat leptospirosis and release healthy animals back into the ocean.
- It is one of the major reasons for the Center rescuing sea lions. We are still trying to identify the reason for the outbreaks. The last major outbreak was in 2018 with over 300 patients admitted. A small spike in patients was observed in 2017, with just over 30 animals rescued. In some years however, like 2015, no animals were rescued for leptospirosis.
- This is also a reason why our volunteers must wear protective clothing, boots and gloves to ensure any disease is contained solely within a pen and not transmitted to other animals or people.
- On-going studies of disease in marine mammals are essential for successful monitoring of the general health of their populations, and of the ocean more broadly. These studies help us to understand the possible role of a particular disease when there is a major mortality event or mass stranding event, and also to know when we must search for other causes (such as other diseases, disruption of oceanic, habitat and climatic conditions, or reduced availability of food).
- In addition to learning about leptospirosis in sea lions, this research helps us to learn about the basic ecology of the disease and the bacteria that cause it, and also to learn general principles about how pathogens spread in wildlife populations.
Cancer

What is it?
Sea lions get a specific form of cancer: a reproductive-urinary tract carcinoma.

Primary Species Affected:
California sea lion

Seasonality:
No seasonality. Approximately 17-24% of the adult California sea lions that die each year at the Center have cancer.

Adult females are close to four times more likely than adult males to have cancer. Almost entirely found in adult sea lions, although rare cases of subadult and juvenile animals have been observed. Typical age of affected patients is approximately 8 years old.

Causes:
Research is still in progress, but there are three potential factors that are hypothesized to cause the cancer:
- Genetics (similar to how people with cancer in the family are more susceptible themselves)
- Environmental contaminants such as DDT (a pesticide) and PCBs (synthetic oil-like chemical)
- Herpes virus, closely related to Kaposi’s sarcoma virus known to cause cancer in human AIDS patients

Symptoms:
1) Hind-end paralysis
2) Urinary or genital prolapse (organs are protruding out of normal place)
3) Tumors

Treatment:
Currently there is no treatment for the cancer and the animal will pass away or be euthanized.
Current Research:
- What is the role of each and relationship between genetics, environmental contaminants and the Herpes virus causing the cancer?

Important Notes:
- Cancer in California sea lions is the 2nd highest prevalence of cancer in any wild animal population (Tasmanian devils have the highest prevalence)
- First discovered by The Marine Mammal Center in 1979
- The research that is being conducted on cancer in sea lions is directly applicable to studying human cancers

Messaging At The Marine Mammal Center:
- Sea lions are mammals similar to us and suffer from many of the same diseases that people get.
- Sadly, while animals are not able to be treated, we are able to learn from each animal and hopefully what we learn about the cancer can eventually lead to us preventing future cases of cancer in both sea lions and humans.
- Since the Center discovered the cancer in 1979, Center staff have worked with partners from around the world studying the cancer and is a leading member of the Sea Lion Cancer Consortium.
- We work with organizations around the world to expand knowledge and treatment opportunities for human patients with cancer.
- Reducing our use of fertilizers, pesticides and other chemicals that can run off into the ocean can help prevent cancer in the future.
Pneumonia

What is it?
Pneumonia is defined by fluid in the lungs. It can cause severe respiratory problems if not treated.

Primary Species Affected:
Occurs in all marine mammals, but seen most with California sea lions and elephant seals at the Center.

Seasonality:
We typically see pneumonia in young sea lion pups (ages 8 months - 1.5 years) coming into the Center in the late Spring and Summer.

Causes:
Pneumonia can be caused by two sources:
- Parasite: One of the most common forms of pneumonia is caused from lungworm parasites (*Otostrongylus* in seals, *Parafilaroides* in sea lions) getting into the lungs
- Bacteria: Typically this is a secondary infection of another disease where the animal’s health is compromised and bacteria begins to spread

Frequently, animals suffering from pneumonia present as very malnourished and emaciated. It is unknown if they developed pneumonia in tandem with, prior to, or after becoming malnourished.

Symptoms:
Pneumonia is specific to the lungs, causing respiratory distress in an animal. Specific symptoms include:
1) Coughing and/or wheezing
2) Difficult or labored breathing
3) Bleeding from the lungs (in the case of *Otostrongylus*)

Treatment:
- Offer fish to animals, and slowly increase amount of food throughout animal’s stay
- If not eating, tube feed animals a formula consisting of ground herring, salmon oil and water
- Subcutaneous fluids
- Deworming medication, such as praziquantel or fenbendazole
- Rehabilitation ranges between 4-8 weeks, as the animal reaches a suitable release weight.

Messaging At The Marine Mammal Center:
- These animals can get many of the same diseases that humans get.
Parasites

What is it?
Marine mammals can get many different forms of parasites. A parasite is defined as an animal that obtains its nutrients from a host while negatively affecting the host.

Primary Species Affected:
Occurs in all marine mammals. There are many parasites that affect these animals, so only a few are highlighted.
- California sea lions: Roundworms, tapeworms, lungworms
- Elephant seals and harbor seals: Lungworms (Otostrongylus), roundworms, tapeworms

Seasonality:
Severe cases are frequently observed with younger animals. Peak numbers typically occur in the spring (elephant seals and harbor seals) and summer (California sea lions)

Causes:
Parasites are natural and frequently observed in marine mammals. It is only when the animal is already compromised that parasitic infections will cause negative health effects. Animals acquire parasites from ingesting fish that possess the parasites.

Symptoms:
Parasites are natural in marine mammals, so the presence of parasites does not mean they will exhibit symptoms or need medication attention. Severe cases present with:
1) Malnutrition
2) Coughing
3) Difficult or labored breathing
4) Death (in severe cases of Otostrongylus in elephant seals)

Treatment:
- Offer fish to animals, and slowly increase amount of feed throughout animal’s stay
- If not eating, tube feed animals a formula including ground herring, salmon oil, and water
- Deworming medication, such as praziquantel or fenbendazole
- Rehabilitation ranges between 4-8 weeks, as the animal reaches a suitable release weight

Current Research:
- Otostrongylus (Oto) is seen in both elephant seals and harbor seals. While the parasite causes little difficulty for harbor seals, it has been found to be deadly in elephant seals. De-worming medication does not treat the infection so new medications such as anti-inflammation drugs are being trialed to determine the best treatment protocol for the future.

Messaging At The Marine Mammal Center:
- These animals can get many of the same parasites that humans get.
- You can notice on our interactive exhibit in the exhibit hall, “Cantaloupe” the sea lion, you can see roundworms in the stomach of a California sea lion
Human Interaction

**What is it?**
Human interaction includes harassment of animals on the beach, illegally picking animals up off the beach, gunshot wounds, entanglement in trash, ingestion of trash, and boat strikes. Each year, approximately 80-100 of the animals rescued are admitted due to human interaction.

**Seasonality:**
There is no particular pattern, with the exception of human involvement in separating mothers and pups on the beach (typically involving harbor seals in the spring).

All animals, and age classes, can be affected by these aspects of human interaction.

**Causes:**
While it is against the law to approach, harm or harass any marine mammal, we still see many instances of both direct harassment as well as unintentional harm.

Harassment and Maternal Separation (approximately 7% of all admits are harassed, but many more could be unreported or indirectly affected)
Many issues are related to humans approaching marine mammals on the beach. Approaching animals can not only separate mom and pup, but also lead to increased stress, further injury (in the case of touching or picking up the animal) or allowing dogs to approach and bite the animal.

Gunshot (approximately 3% of all admits)
Sadly, each year the Center rescues an average of 10-20 gunshot victims. Gunshot victims are almost exclusively California sea lions (approximately 7% of sea lions rescued each year are gunshot victims). It depends on the extent and location of the gunshot wound if we are able to successfully rehabilitate them. While we rarely identify who shot the animal, if found, the individual can go to jail for over a year and heavily fined. Of the past 200 cases, only 2 people have ever been identified though so we cannot say why people are shooting sea lions, or what groups are responsible.

Boat Strikes (less than 1% of all admits)
Boat strikes are incredibly rare with seals and sea lions, but have occurred in the past. Large whales are the most commonly found with boat strike wounds having washed up on shore already dead. The Marine Mammal Center has cared for two humpback whales (Delta and Dawn) in 2007 that had been struck by boats. Veterinarians successfully administered antibiotics to the whales in the Sacramento River (a first time medicine has been admitted to a free-swimming whale) and treated their wounds before working with several organizations to guide the whales out of the Bay.

Ocean Trash (approximately 3-4% of all admits)
Ocean trash is dangerous for two reasons: entanglement and ingestion. Most ocean trash is plastic and because it can last forever, it poses a constant threat to all marine mammals. Items like balloons, netting, and packing straps can entangle animal’s flippers and necks causing severe wounds and even death. Since sea lions are extremely curious and playful, they are most susceptible. There are many cases of ingestion of trash as well, where seals and sea lions have been rescued having swallowed plastic bags, netting or balloons mistaking them for food (most likely sea jellies, squid and stingrays).
Messaging At The Marine Mammal Center:

- Each year, typically 80-100 animals are rescued directly due to negative human interaction.
- If you see an animal on the beach, please don’t approach it. Call The Marine Mammal Center rescue hotline at 415-289-SEAL (7325)
- Simple actions wherever you live or work can be taken to help save seal and sea lion lives:
  - Plastic lasts forever, so one of the most successful ways to help seals and sea lions is to reduce your use of plastic by using reusable canvas bags, reusable water bottles and eliminating the use of single-use plastic
  - Any trash that is up on land can get out to the ocean through the wind, sewers and waterways, so no matter where you live, you can help save animals by picking up trash and reusing as much as possible
- Organize beach or watershed clean-ups for your local area or school
- Tell your friends, family, and colleagues about how they can help seals and sea lions
- Contact your state and federal representatives and urge them to vote for legislation aimed at improving the environment, environmental friendly energy practices, and improving the conditions and protection of marine mammals
Overview of Pinnipeds

There are 5 groups of marine mammals in the World:
- Pinnipeds: Seals, sea lions and walruses
- Cetaceans: Porpoises, dolphins and whales
- Sea otters
- Sirenians: Manatees and dugongs
- Polar Bears

Pinnipeds are “flipper-footed” mammals and, in total, there are 34 different species of pinniped in the World. There are 3 types of Pinnipeds:
- Seals (Family Phocids)
- Sea Lions and Fur Seals (Family Otariid)
- Walruses (Family Odobenidae)

<table>
<thead>
<tr>
<th>Differences Between Seals and Sea Lions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sea Lions and Fur Seals</strong></td>
</tr>
<tr>
<td>1) External ear flaps</td>
</tr>
<tr>
<td>2) Long front flippers, used for propelling through water and climbing on land</td>
</tr>
<tr>
<td>3) Back flippers can rotate underneath body allowing them to walk and climb using all four flippers</td>
</tr>
<tr>
<td>4) Only claws on hind flippers</td>
</tr>
</tbody>
</table>

There are 6 species of Pinnipeds that are found in California:
- California sea lion
- Northern elephant seal
- Pacific harbor seal
- Northern fur seal
- Guadalupe fur seal
- Steller sea lion
## Characteristics of 3 Most Common Patients at The Marine Mammal Center

<table>
<thead>
<tr>
<th></th>
<th><strong>CALIFORNIA SEA LION</strong></th>
<th><strong>NORTHERN ELEPHANT SEAL</strong></th>
<th><strong>PACIFIC HARBOR SEAL</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Zalophus californianus</td>
<td>Mirounga angustirostris</td>
<td>Phoca vitulina</td>
</tr>
<tr>
<td><strong>Adult Weight</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MALE</td>
<td>600-850 lbs</td>
<td>4,500 lbs</td>
<td>250 lbs</td>
</tr>
<tr>
<td>FEMALE</td>
<td>200-250 lbs</td>
<td>1,300 lbs</td>
<td>250 lbs</td>
</tr>
<tr>
<td><strong>Adult Length</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MALE</td>
<td>6 ft – 8 ft</td>
<td>13.5 ft-15 ft</td>
<td>4.5 ft – 6.5 ft</td>
</tr>
<tr>
<td>FEMALE</td>
<td>5 ft – 6.5 ft</td>
<td>10 ft</td>
<td>4 ft – 6 ft</td>
</tr>
<tr>
<td><strong>Life Span</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MALE</td>
<td>15-20 yr</td>
<td>12-14 yr</td>
<td>25 yr</td>
</tr>
<tr>
<td>FEMALE</td>
<td>20-30 yr</td>
<td>18-20 yr</td>
<td>35 yr</td>
</tr>
<tr>
<td><strong>Birth Seasonality</strong></td>
<td>Late Spring to peak in mid-June</td>
<td>Late December to early March</td>
<td>March - April</td>
</tr>
<tr>
<td><strong>Pups Time with Mom</strong></td>
<td>6-9 months</td>
<td>1 month</td>
<td>4-6 weeks</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>Solid brown fur, ranging from light blonde to dark chocolate shades</td>
<td>Pups have a thick black fur until 1 month old. Older animals have beige to silver fur</td>
<td>Spotted. Can be black with white spots, or white with black spots</td>
</tr>
<tr>
<td><strong>Vibrisae (whiskers)</strong></td>
<td>Smooth, white</td>
<td>Beaded, solid black</td>
<td>Beaded, white</td>
</tr>
<tr>
<td><strong>Locomotion on Land</strong></td>
<td>Walk using front and back flippers; proficient climbers</td>
<td>Scoot on belly like inchworm</td>
<td>Scoot on belly like inchworm</td>
</tr>
<tr>
<td><strong>Vocalizations</strong></td>
<td>Bark</td>
<td>Pups cackle and shriek. Adults snort.</td>
<td>Pups make “maa” sound. Adults growl</td>
</tr>
<tr>
<td><strong>Common Reasons for Rescue</strong></td>
<td>• Malnutrition</td>
<td>• Maternal separation</td>
<td>• Maternal separation</td>
</tr>
<tr>
<td></td>
<td>• Pneumonia</td>
<td>• Malnutrition</td>
<td>• Malnutrition</td>
</tr>
<tr>
<td></td>
<td>• Domoic acid toxicity</td>
<td>• Parasites</td>
<td>• Illegal “pick-ups” by public</td>
</tr>
<tr>
<td></td>
<td>• Ocean trash</td>
<td>• Ocean trash</td>
<td>• Harassment</td>
</tr>
<tr>
<td></td>
<td>• Cancer</td>
<td>• Skin disease</td>
<td>• Umbilicus cord infections</td>
</tr>
<tr>
<td></td>
<td>• Leptospirosis</td>
<td>• Pneumonia</td>
<td>• Dog bite wounds</td>
</tr>
<tr>
<td><strong>Peak Season at The Marine Mammal Center</strong></td>
<td>Spring/Summer (malnourished yearlings)</td>
<td>Spring (young 1-3 month old pups)</td>
<td>Spring (less than 1 month old pups)</td>
</tr>
</tbody>
</table>
California Sea Lions (CSL)

California sea lions are the most common patient admitted to The Marine Mammal Center. The Center has responded to over 14,000 California sea lions since 1975!

**Physical Characteristics:**

- **Weight:** Adult males: 600-850 pounds    Adult females: 200-250 pounds    Birth weight: 12-15 pounds
- **Gender Differences:**
  - Males develop a sagittal crest beginning at 4 years of age, fully developed by 7 years
  - Females are sexually mature at 3 years old, males are sexually mature at 5 years old
  - Males are significantly larger than females
  - Males have a darker fur color (chocolate brown) as compared to females (light blonde)
- **Range:** Coastal animals, ranging from Baja California to British Columbia, Canada
  - Females give birth in Southern California and remain in that area with some traveling into Central California with pups
    - Breeding grounds are offshore, remote islands like the Channel Islands
  - Males migrate further north towards British Columbia
  - Sea lions return to the rookeries (i.e. breeding grounds) every winter to molt (shed their fur)
- **Diet:** Opportunistic feeders, feed mostly on small schooling fish (anchovies/herring/sardines), squid and octopus
- **Life Expectancy:**
  - Males: 15-20 years    Females: 20-30 years
- **Mom and Pup:**
  - Pups are born in early summer, with peak births occurring on June 15 (weigh approx. 15 pounds)
  - Pups spend 9-10 months with their mother learning to swim and hunt
  - Females mate in summer (3 months delayed implantation within 11-month total gestation)
At The Marine Mammal Center:

Peak Season (Might have over 170 sea lions onsite a one time in March-September):
• Spring/Summer (malnourished pups and yearlings, approximately 7-months-old to 1-year-old)
• Fall (juveniles and adults suffering from domoic acid toxicosis and/or leptospirosis)

Common Ailments:
• Malnutrition
• Pneumonia
• Domoic acid toxicity
• Ocean trash (ingestion and entanglement)
• Cancer
• Leptospirosis

Public Viewing:
Typically, juvenile and adult sea lions will be visible in the front and second row of pens. Younger animals (i.e. pups and yearlings) will be out of public view due to risk of habituation.

Around the Bay Area:

PIER 39:
Wild California sea lions use PIER 39 as a place to rest on their migration up and down the California coast. The docks provide a perfect spot for the animals to rest, the bay provides ample small fish as food, and the bay is protected from predators (Orcas and Great white sharks).

Sea lions began arriving in 1989, as the dock had recently been refurbished and for a period of time no boats were docked there, leaving large open spaces where sea lions could easily haul out. When the boats returned, no real effort was made to discourage the sea lions from hauling out. Since then, the number has only continued to grow and reached a record of 1,700 animals at one time in 2009. Typically, during peak season a few hundred sea lions are present on the docks.

Their numbers at PIER 39 varies dramatically throughout the year. Numbers peak at PIER 39 every spring and fall (opposite times when they are in Southern California for the breeding and molting season)

Given their migratory patterns, almost all sea lions at PIER 39 are male (females do not typically migrate as far north as San Francisco)!

Fun Facts:

California sea lions are one of the fastest marine mammals, able to swim up to 25 miles an hour (that is 5 times faster than the faster human swimmer)!

California sea lions are the most common patient at The Marine Mammal Center, accounting for approximately 60% of all the patients rescued each year!

These are the animals easily viewable at PIER 39!

The Marine Mammal Center has rescued over 14,000 California sea lions since 1975!
Northern Elephant Seals (ES)

Northern elephant seals are the 2nd most common patient admitted to The Marine Mammal Center (approximately 20% of all patients rescued each year). The Center has responded to over 4,400 elephant seals since 1975!

Physical Characteristics:

Weight: Adult males: 4,500 pounds   Adult females: 1,300 pounds   Birth weight: 75 pounds

Gender Differences:
- Males are significantly larger than females
- Males develop a large proboscis beginning at 3 years of age, fully developed by 8 years
- Females are sexually mature at 4-5 years old, males are sexually mature at 3-5 years old
- Males develop a calloused chest from fighting with other male elephant seals

Range: Open ocean animals, ranging from Baja California to Alaska
- Females give birth in California
  - Breeding grounds are offshore islands, including the Channel Islands, Año Nuevo, Point Reyes, and Piedras Blancas (San Simeon)
- Males migrate further north towards Alaska continental shelf, while females feed in open ocean
- Spend 250-300 days in the open ocean, coming onto land only twice each year

Diet:
Opportunistic feeders, feeding mostly on small schooling fish (anchovies/herring/sardines), squid, octopus, and small sharks

Life Expectancy:
Males: 12-14 years   Females: 18-20 years
Mom and Pup:
- Pups are born in winter between December-February
- Pups spend 28 days with mother drinking milk (gain 8 pounds per day). After 1 month, mother leaves pups. Pups weigh 300 pounds, but must learn to swim and eat on their own
- Following the one month with their pup, females mate before returning to water (4 months delayed implantation within 11-month total gestation)

At The Marine Mammal Center:

Peak Season (Might have over 100 elephant seals onsite at one time in March-May):
- Almost all elephant seals rescued are pups between 1-3 months old that weigh less than 100 pounds, close to 200 pounds underweight!

Common Ailments:
- Maternal separation
- Malnutrition
- Parasites (Otostrongylus)
- Elephant seal skin disease

Public Viewing:
Typically elephant seals will be in the front row with in-ground pools to allow for elephant seals to practice swimming and eating easily.

Around the Bay Area:

Elephant seals only come onto land twice each year (once in the summer for molting, once in the winter for pupping and mating) and always at the rookeries (breeding grounds). There are only three places in the Northern hemisphere you can view elephant seals and all three are within driving distance of the Bay Area. Piedras Blancas (San Simeon) is the largest with over 6,000 elephant seals at its peak, Año Nuevo State Park (Pescadero) with upwards of 3,000 animals at peak season, and Point Reyes National Seashore, with upwards of 1,000 animals

Fun Facts:
Northern elephant seals dive 5,000 feet below the surface and stay underwater for 2 hours at a time!

Elephant seals have the longest migration of any mammal in the World. They travel between California and Alaska twice each year, a total of 14,000 miles!

An adult male elephant seal weighs close to 4,500 pounds. That is more than the entire starting offense of an NFL football team. Pups are born at 75 lbs and 4 ft long (that is about the size of a 3rd grader). At just one month old, an elephant seal will weigh 300 pounds, more than most professional football players!

Elephant seals at The Marine Mammal Center have been used as voices for numerous movie characters including the Velociraptors in Jurassic Park, the Orks in Lord of the Rings, and dragons in How to Train Your Dragon!

Hunted to near extinction in the late 1800s, the Elephant Seal population was estimated at just 75 individuals and only found off of Guadalupe Island before being granted protection and now rebounding to over 179,000 individuals!
Pacific harbor seals are the 3rd most common patient admitted to The Marine Mammal Center (approximately 13% of all patients rescued). The Center has responded to over 2,800 harbor seals since 1975!

**Physical Characteristics:**

- **Weight:** Adult males: 250 pounds     Adult females: 250 pounds     Birth weight: 18-25 pounds
- **Gender Differences:**
  - Males and females are similar size and weight
  - Females are sexually mature at 4-5 years old, males are sexually mature at 3-4 years old
- **Range:** Non-migratory, found in coastal communities around the East and West coast of the US
  - Small populations of harbor seals found spread along west coast from Baja California to Alaska
  - Prefer sandy beaches and mudflats for resting on land and breeding grounds, but will also haul out on rocks exposed during low tides
    - Breeding grounds are isolated beaches like Fitzgerald Marine Reserve, Bodega Bay and Point Reyes National Seashore
- **Diet:** Opportunistic feeders, feeding mostly on small schooling fish (anchovies/herring/sardines), crustaceans and shellfish
- **Life Expectancy:**
  - Males: 25 years     Females: 35 years
- **Mom and Pup:**
  - Pups are born in spring between February & May
  - Pups spend 4-6 weeks with mother drinking milk and learning how to hunt
  - Following 1-2 months with their pup, females mate (1.5-3 months delayed implantation within 11-month total gestation)
At The Marine Mammal Center:

Peak Season (Might have over 70 harbor seals onsite at one time in April-June):
- Almost all harbor seals rescued are pups between 0-1 month old that have been separated from their mothers due to big storms or people/dogs on the beach scaring the mother away

Common Ailments:
- Maternal separation
- Dog bite wounds
- Harassment
- Malnutrition

Public Viewing:
Typically harbor seals will not be visible to the public, as they are so young and require specialized care that they must be kept in the private harbor seal hospital and Intensive Care Unit.

Around the Bay Area:

Harbor seals are typically the most commonly seen seal or sea lion in California. They can be easily found in the waters surrounding San Francisco and Sausalito.

Accessible breeding grounds include Fitzgerald Marine Reserve and Point Reyes National Seashore.

Fun Facts:

Harbor seals are the only spotted seal or sea lion found in California.

Harbor seals are unique among the California pinnipeds in that they can swim at birth.

Harbor seals can be seen during low tide in the Marin Headlands near the Point Bonita lighthouse.

The Marine Mammal Center has rescued over 2,400 harbor seals since 1975!

We have seen harbor seal pups rescued by The Marine Mammal Center at just a few days old that after rehabilitation at the hospital have gone on to have pups of their own!
Northern Fur Seals (NFS)

Northern fur seals are not one of the most common animals rescued by The Marine Mammal Center, but the Center will rescue between 1-20 Northern fur seals per year. Although they are called seals, fur seals are part of the sea lion family.

Two subpopulations of Northern fur seals exist in the North Pacific Ocean. The California population is estimated at approximately 14,050 individuals and not listed as depleted or endangered. The Eastern Pacific stock, due to a decline of 50% of their population since 1950 for unknown reasons, is considered depleted under the Marine Mammal Protection Act. Fur seals are rarely seen on the California mainland, instead spending most of their time swimming or on offshore islands. If a fur seal is found on the California mainland, it is typically because they are sick or injured.

Physical Characteristics:

- Ear flaps (longer than sea lions)
- Shallow, pointed snout
- Dense, thick fur
- Long front flippers (longer than sea lions) with fur ending in the middle of the flipper

Weight: Adult males: 600 pounds     Adult females: 130 pounds     Birth weight: 10-12 pounds

Range: Open ocean, ranging from Subarctic waters of Russia and Alaska to California coastline
- 75% of the population inhabits the Pribilof Islands, small uninhabited islands along the Alaskan Aleutian island chain

Diet:
Mostly small schooling fish (herring, pollock, anchovies) and squid

Life Expectancy:
Males: 10 years     Females: 27 years

Mom and Pup:
- Pups are born in June and July
- Females nurse pups for 8-10 days and then leave on foraging trips, returning every 4-5 days to nurse. Pups are weaned after 4 months.
- Females mate 8-10 days following giving birth (2 months delayed implantation within 9-month total gestation)
**At The Marine Mammal Center:**

Typically, the Center will rescue on average between 2-7 Northern fur seals a year. Fur seals, due to their depleted status, and since most of the cases are weaned pups, will not be visible to the public.

Most fur seals rescued will occur in the late fall as newly weaned fur seals become malnourished and strand on land. These 4-6 month old pups are severely underweight and need to be tube-fed until they can eat food on their own and are a suitable weight for release.

**Common Ailments:**
- Malnutrition
- Oil/Tar

**Around the Bay Area:**

Northern fur seals are not found reliably in the Bay Area. There is a population at the Farallones Islands as the closest landmark for viewing. There are only 4 zoos and aquariums in the World with Northern fur seals in captivity.

**Fun Facts:**

In 2015, the Center rescued a record 107 Northern fur seals, almost entirely 4 and 5 month old, malnourished pups. The previous record was 31 animals in 2006.

Northern fur seals have extremely dense fur with over 325,000 hairs per square inch (that it like the number of hair on more than three human heads squeezed into the size of a quarter)!

Fur seals are pelagic. Adult fur seals spend more than 300 days per year (about 80% of their time) foraging at sea.

Since 1975, The Marine Mammal Center has admitted over 430 Northern fur seals in its history.

While sleeping at sea, fur seals will often “jug handle" with their hind flippers folded forward and held in place by a fore flipper, allowing for buoyancy and comfort.

Fur seal strandings can serve as an indicator of El Nino seasons. Typically, at the beginning of an El Nino year, we will see an influx of northern fur seals in need of rescue due to shifting prey abundance and younger fur seals unable to find food and stranding malnourished. In 1997, prior to a strong El Nino year, the Center rescued 33 Northern fur seals.

In 2014, The Marine Mammal Center transferred Ziggy Star, an adult Northern fur seal, to the Mystic Aquarium in Connecticut for permanent placement, as she was deemed unreleasable after being diagnosed with brain damage similar to multiple sclerosis in people (she is the first living marine mammal to be diagnosed with this form of brain damage)!
Guadalupe fur seals are not one of the most common animals rescued by The Marine Mammal Center, but the Center has rescued just over 160 animals in its 40-year history. Although they are called seals, fur seals are part of the sea lion family.

Guadalupe fur seals are listed as threatened under the Endangered Species Act, with only 34,000 individuals remaining. They are rarely seen on the California mainland, instead spending most of their time swimming or on offshore islands. If a fur seal is found on the mainland, it is typically because they are sick or injured.

**Physical Characteristics:**

- Ear flaps (longer than sea lions)
- Slightly more elongated snout than Northern fur seal
- Dense, thick fur
- Long front flippers (longer than sea lions) with fur running along most of flipper

**Weight:** Adult males: 400 pounds   Adult females: 110 pounds   Birth weight: 13 pounds

**Range:** Open ocean, but only found in area surrounding Guadalupe Island and occasionally farther north into Southern California.

- All breeding occurs on the eastern side of Guadalupe Island

**Diet:**
Mostly squid, mackerel and lanternfish

**Life Expectancy:**
Males and Females: Estimated at 20 years

**Mom and Pup:**
- Pups are born in June and July
- Females nurse pups for 8-10 days and then leave on foraging trips, returning every 2-6 days to nurse. Pups are weaned after 9 months.
- Females mate 8-10 days following giving birth (2 months delayed implantation within 9 month total gestation)
At The Marine Mammal Center:

It is rare for The Marine Mammal Center to rescue Guadalupe fur seals. Of the over 160 animals rescued, most have been malnourished weaned pups or entangled pups. Due to their threatened status and their fragile state, fur seals will rarely be visible to the public.

Between 2015-2017, over 90 Guadalupe fur seals were rescued due to record warming temperatures along the California Coast (more than the previous 40 years combined). The warm water temperatures pushed the fish deeper and farther offshore making it difficult for the young pups to find and catch fish on their own.

Common Ailments:
- Malnutrition
- Entanglement in trash

Around the Bay Area:

Guadalupe fur seals are not found reliably in the Bay Area, unless they are sick and stranded.

Fun Facts:

The Marine Mammal Center has rescued just over 160 Guadalupe fur seals in their over 40-year history. Between 2015-2017, the Center rescued over 90 of them though, mainly due to record warm water temperatures that made it difficult for the young pups to find food.

Previous to 2015, only 5 Guadalupe fur seals had ever been tracked and their migration pattern was largely unknown. Utilizing satellite tags, the Center placed over 25 tags on former patients and were able to better understand their migration pattern and discover they travel all along the US Pacific Coast! This was confirmed when the Center participated in an international effort in 2017 and tagged over 35 wild, healthy Guadalupe fur seals on Guadalupe island.

20% of all the Guadalupe fur seals rescued by The Marine Mammal Center have been rescued due to ocean trash entanglements.

Guadalupe fur seals' breeding grounds are almost entirely on Guadalupe Island, Mexico.

Hunted to the brink of extinction by the late 19th century, they were not reported again until 1926. Following this “rediscovery” all animals that could be found were taken and once again the species was thought to be extinct. Guadalupe Fur Seals were suspected to have survived, because of scattered unconfirmed reports in the 1930s, and were rediscovered once again on San Nicholas Island in Southern California in 1949. An expedition to Guadalupe Island in 1954 confirmed the survival of the species.

Because the Guadalupe Islands are a preferred breeding area for many species, the Mexican government has declared the islands a protected sanctuary.
Steller sea lions are not one of the most common animals rescued by The Marine Mammal Center, but the Center has rescued just over 30 animals in its over 40-year history.

Steller sea lions are one of only two species to ever be removed from the Endangered Species list. The Eastern population (found along the US and Canadian Pacific coast) was delisted in 2013. The Western population (found along the Alaskan and Russian coast) is listed as endangered.

**Physical Characteristics:**

![Steller Sea Lions](image)

- **Ear flaps**
- **Broad, short snout**
- **Brown fur**
- **Long front flippers**

**Weight:** Adult males: 2,500 pounds  Adult females: 770 pounds  Birth weight: 35-50 pounds

**Gender Differences:**
- Males develop a thick mane around their neck
- Females are sexually mature at 4-6 years old, males are sexually mature at 3-8 years old
- Males are significantly larger than females

**Range:** There are two stocks of Steller sea lions. Both prefer near shore areas with space to haul out to rest.
- Eastern population (found along the US and Canadian Pacific coast)
- Western population (found along the Alaskan and Russian coast)

**Diet:**
Opportunistic feeders including small schooling fish (anchovies, herring, mackerel), squid, and octopus

**Life Expectancy:**
Males: 20 years  Females: 30 years
Mom and Pup:
- Pups are born in June
- Females nurse pups for 2 weeks and then leave on foraging trips at night, nursing during the day. Pups are weaned after 1 year
- Females mate 2 weeks following giving birth (3.5 months delayed implantation within 8-month total gestation)

At The Marine Mammal Center:

It is rare for The Marine Mammal Center to rescue Steller sea lions. Of the less than 30 animals rescued, most have been young pups that have been separated from their mothers. Due to their threatened status and their fragile state, Steller sea lions will rarely be visible to the public.

Common Ailments:
- Maternal separation
- Malnutrition

Around the Bay Area:

Steller sea lions are not typically found in California, with only approximately 4,000 individuals in California waters. There are breeding grounds at Año Nuevo Island and the Farallones Islands with small populations at each.

One Steller sea lion cared for in 1999 named Artemis was rescued as a 5-10 day-old pup that had separated from her mother. After 9 months of care, she was successfully released. 6 years later, she was identified by her flipper tag with a pup of her own!

In 2014, the Center cared for a 5-month old pup named Leo. He had been separated from his mother and stranded in Washington State. He was flown to The Marine Mammal Center where he was in treatment for 5 months before being released 300 pounds heavier and with a satellite tag to follow his journey back out in the wild!

Our most recent Steller sea lion patient was a couple month old pup named Smores. She was rescued by the Northcoast Marine Mammal Center in Humboldt, CA and transferred to the Center for long-term care. She was at the Center for 9 months before being successfully released back to the ocean.

Fun Facts:

Steller sea lions are one of only three species to ever be removed from the Endangered Species list. The Eastern population (found along the US and Canadian Pacific coast) was delisted in 2013. The Western stock is unfortunately still listed as critically endangered.

Steller sea lions are the largest species of sea lion in the World!

Steller sea lions vocalizations sound more like a "roar" when compared to California sea lions, which sound more like a "bark."
Hawaiian Monk Seals (HMS)

Hawaiian monk seals are only found surrounding the Hawaiian Islands. All care is provided to the animals on the Hawaiian Islands, as animals are not brought to the facility in California.

Hawaiian monk seals are listed as endangered under the Endangered Species Act, and are the most endangered seal or sea lion found in the United States. Their numbers are estimated at 1,400 and, following many years of decline, have started to show an increase of population since the Center built a hospital in Hawaii in 2014.

Physical Characteristics:

Weight: Adult males and females: 375-450 pounds  Birth weight: 35 pounds

Range: Only found around the Hawaiian Islands in coastal waters. They spend 2/3 of their time at sea. Two main populations:
  - Northwest Hawaiian Islands (uninhabited by people)
  - Main Hawaiian Islands

Diet:
Squid, octopus, bottom-dwelling fish and crustaceans

Life Expectancy:
Males and Females: 25-30 years

Mom and Pup:
  - Most births occur in late March and early April, but birthing has been recorded year-round
  - Pups spend 1 month with mother drinking milk. After one month, mother leaves pups and pups must learn to swim and eat on their own
  - Following one months with the pup, females mate before returning to water (11-month total gestation)
At The Marine Mammal Center:

While outside of The Marine Mammal Center’s 600-mile rescue range, we still help provide care for Hawaiian monk seals through a partnership with NOAA and the National Marine Fisheries Service due to their endangered population and need for help.

In the fall of 2012, The Marine Mammal Center began construction on a new state-of-the-art hospital and visitor center for Hawaiian monk seals on the Kona coast of the Big Island, which will provide a facility to allow for the rescue, rehabilitation and release of sick and hurt monk seals on the islands. The hospital, named Ke Kai Ola meaning “The Healing Sea”, officially opened and began caring for patients in September 2014. Since the hospital opened in 2014, the Center has cared for over 2% of the entire Hawaiian monk seal population!

Common Ailments:
- Maternal separation
- Malnutrition
- Toxoplasmosis
- Shark bites
- Entanglement/Ingestion of ocean trash

Fun Facts:
The Hawaiian monk seal is the most endangered seal or sea lion in United States!
The Hawaiian monk seal is the only warm water seal in the world!
Over 30% of the Hawaiian monk seal population is alive today due to rehabilitation efforts by groups such as the National Oceanic and Atmospheric Administration (NOAA) and The Marine Mammal Center.

Monk seals are named for the folds of skin on their head that look like a monk's hood and because they spend most of their time alone or in small groups.

The Marine Mammal Center has cared for over 24 Hawaiian monk seals since Ke Kai Ola opened in 2014. That is over 2% of the entire monk seal population.

The ancient Hawaiian name is "Ilio holo l ka uaua" meaning "dog that runs in rough water."

Isolated from their closest relative 15 million years ago, Hawaiian monk seals are considered a "living fossil" because of their distinct evolutionary lineage.

There are two other species of monk seals in the World. The Mediterranean monk seal is critically endangered with only 500 individuals remaining (all found in the waters surrounding Greece and Italy). The Caribbean monk seal was declared extinct in 1952.
Climate Change

What is it?

The burning of fossil fuels like coal, oil, and natural gas release carbon dioxide that acts like a heat-trapping blanket in the atmosphere, raising the temperature of the land, air, and water. As more carbon dioxide is in the atmosphere, the ocean absorbs the carbon causing a shift in the pH of the ocean to be more acidic. The warmer water also expands and higher temperatures cause ice to melt resulting in sea level rise.

Terminology:
- Weather refers to short-term atmospheric conditions: “What you see”
- Climate refers to long-term conditions: “What you expect”
- Global warming refers to the temperature of the Earth on a global scale increasing
- Climate change refers to multiple changes and variables and can be both regional or global

Predictions:

The science is clear that the climate is warmer at a faster pace than ever seen before in history, with 97% of climate scientists agreeing that climate change is occurring and caused by humans. This increase in temperature coincides with an increase in carbon dioxide emissions in the past 60 years. The largest remaining unknown variable is the rate at which people continue to use fossil fuels and release carbon dioxide into the air.

What are the effects?

- Warming air, land and water temperatures
- Changes in migratory pattern or habitat shifts
- Sea level rise
- Extreme weather events
- Ocean acidification
- Coral bleaching
How does it affect marine life?

Marine mammals are quite resilient, but warming water temperatures, sea level rise, and ocean acidification are affecting the habitats and food supply for many marine mammals.

- Rising sea levels reduce the amount of space on many breeding beaches for elephant seals and Hawaiian monk seals.
- As water warms, fish and other prey are moving towards the poles causing longer migrations for animals such as gray whales, and difficulty for young sea lions to find food.
- Ocean acidification causes shelled animals (crabs, coral, etc...) to not be able to build their calcium shells, decreasing the food available for animals higher up the food chain. More acidic water has also been shown to cause neurological problems in numerous fish species.
- More extreme weather events like hurricanes can cause habitat damage to breeding grounds of seals and sea lions, as well as other marine life such as turtles.
- Animals in the Arctic, such as walruses and polar bears, are losing much of their habitat as the warming air and water temperatures melt the ice at increasing rapid rates each year.

Climate Change at The Marine Mammal Center

As a member of the National Network for Ocean and Climate Change Interpretation (NNOCCI) and the Bay Area Climate Literacy Impact Collaborative (Bay CLIC), we raise awareness on climate change and encourage guests and communities to reduce the use of fossil fuels.

In 2014, Adam Ratner was also selected as a Community Climate Change Fellow by the North American Association of Environmental Education for the Center’s climate change training program.

In 2015, The Marine Mammal Center was awarded a grant from the California Coastal Commission Whale Tail Program to launch a climate change education initiative with trainings and additional resources available to staff, volunteers and visitors.

We make strides towards reducing our own use of fossil fuels in numerous ways:

- Use of 100% renewable energy through onsite solar panels and MCE program
- Compost unused fish and human food waste to reduce the amount of methane released from organic products in landfill decomposition
- Electric car charging stations available at the Center (free charging for Center staff/volunteers)
- Incorporating climate change education into guest conversations and education programming

Messaging At The Marine Mammal Center:

- Climate change is caused by the burning of fossil fuels like coal, oil, and natural gas which releases carbon dioxide into the atmosphere. The carbon dioxide acts like a heat-trapping blanket in the atmosphere, raising the temperature of the land, air, and water.
- We must reduce our use of fossil fuels by utilizing alternative energy such as solar and wind.
- Support local businesses and farmer’s market which reduces the need for transportation.
- Encourage schools and businesses to engage in composting programs.
- Participate in public transportation or bike/car-share programs to reduce fossil fuel use from personal vehicles.
Sustainable Seafood

What is it?
Sustainable seafood is marine life that is either farmed or caught in ways that consider the long term vitality of harvested species and the wellbeing of the oceans.

There’s a Limit to the Fish in the Sea
Ocean fish are wildlife—the last such creatures that we hunt on a large scale. After 50 years of advancing technology our reach has grown and populations are declining rapidly.

- We have observed a decline of 90% of the large predatory fish in the ocean
- Currently, 85% of the world’s fisheries are being fished at capacity or are in decline to due overfishing

How Fish is Caught and Farmed?

Wild-Caught
Most fishing practices catch more than what they target resulting in bycatch and habitat damage. Some of the most common practices today are some of the most damaging to the ocean environment.

Trawling: Pocket shaped nets, intended to catch animals like shrimp or fish, are pulled behind the boat either along the bottom of the ocean or middle of the water column. This can destroy the ocean floor bed and fragile habitats and catch fish and other animals indiscriminately, killing them in the process.

Gill Nets: Netting is spread out like a wall and left suspended in the water. Used mostly for catching fish, these walls of invisible netting also catch marine mammals, sharks and turtles accidently.

Long Lines: Mile long fishing lines with hundreds of hooks are stretched out over an area of ocean. While used to catch large open-ocean fish like tuna, marine mammals, sharks and turtles are also frequently caught and killed in the process

Better techniques include pole/troll caught seafood which uses the more traditional fishing pole and hook, reducing the amount of fish taken and any additional bycatch or habitat destruction.

Farmed Seafood (also known as Aquaculture)
Almost half of all seafood is now farmed. The type of fish being farmed and the enclosure can determine whether it is done sustainably.

Salmon and Shrimp: Due to the need for substantial food to grow farmed salmon and shrimp, it requires between 2-10 times as much feed as their wild counterparts, resulting in increased depletion of the food chain than wild fishing. New methods are currently in development, but almost all farmed salmon and shrimp are unsustainable.

Farming species lower on the food chain like tilapia and catfish, which require less feed to grow to needed size for human consumption, is sustainable and encouraged when done using safe and monitored enclosures.

While the United States has relatively good laws in place for sustainable seafood, other countries do not. Currently the USA imports 91% of its seafood, both aquaculture and wild caught.
Sustainable Seafood at The Marine Mammal Center

The Marine Mammal Center is a Conservation Outreach Partner working to provide regional support for the Monterey Bay Aquarium’s Seafood Watch program and a member of the Bay Area Sustainable Seafood Alliance in partnership with The Aquarium of the Bay, The San Francisco Zoo and California Academy of Sciences. We aim to:

- Encourage the use of the Seafood Watch guide and Smartphone App to guests
- Raise awareness of sustainable seafood practices through docents and education programs
- Source sustainable fish for our patients (Pacific herring from Alaska is a “good alternative”, and our salmon oil comes from Wild Alaskan salmon, a “best choice”)

Messaging At The Marine Mammal Center:

- Use the seafood watch recommendations to identify sustainable choices when you purchase seafood
- Ask vendors “Do you sell sustainable seafood” to encourage vendors to source seafood responsible
- Most people are concerned about the origins of their food and look for qualities like organic, free-range, and locally harvested, but rarely look to their seafood in the same scrutiny. Considering where your seafood is from and how it is harvested can shift the use of harmful methods of fishing to more sustainable practices
- Your actions count! Every time you purchase sustainable seafood (or don't buy seafood caught unsustainably) you vote for change!
Ocean Trash

What is it?
Ocean trash is a general term for all the human-created debris that makes its way into the oceans from a variety of methods. 90% of the trash found in the ocean is plastic and the large amounts of trash are having an impact on marine life and marine ecosystems.

Given the chemical process required to turn oil into plastic, plastic cannot biodegrade and therefore last forever. When the large pieces of plastic garbage enter the ocean via waterways, the air and sewers they get broken down into smaller pieces by wind and wave action as well as some bacteria, breaking down into a soup of small plastic particles. These smaller pieces can be mistaken as food (i.e. krill) and ingested by marine mammals and fish.

How does it affect marine life?
Studies show that:
- 44% of all seabirds eat plastic
- 267 different marine species are affected by plastic garbage via ingestion and entanglement
- Plastics are harmful for 3 main reasons:
  - Entanglement
  - Ingestion
  - Absorption and leaching of chemicals (act like sponges and take in other toxins in the environment leading to increased toxin exposure for marine animals)

From International Coastal Clean-Up Day Data from the Ocean Conservancy:

80% of the trash collected from the beaches each year belongs to these 10 categories.
Ocean Trash at The Marine Mammal Center

Each year, The Marine Mammal Center rescues marine mammals exhibiting signs of ocean trash. Typically, California sea lions are rescued with plastic netting, packing straps and other pieces of trash caught around their neck and face. Other animals have been rescued with plastic trash in their stomachs, such as plastic bags and balloons.

What is The Marine Mammal Center doing?

- The Marine Mammal Center is a founding member of the Trash Free Seas Alliance, a collaborative between environmental organizations, such as the Ocean Conservancy and Keep America Beautiful, with corporations, such as the Dow Chemical Company and Coca-Cola, to identify cross-sector solutions to ocean trash.
- Incorporating ocean trash education into guest conversations and education programming
- Use stories of marine mammal patients that have experienced the negative effects of ocean trash for education and raising awareness
- Encouraging people to reduce their use of plastic whenever possible and reuse and recycle all plastic they do use!
- Participation:
  - Organize and participate in beach cleanups each year
  - Beach cleanup bins at Rodeo Beach
  - Bins around the property for recycling
  - We sell products in our gift shop made of recycled or alternative materials to plastic
  - Try to support suppliers using less or better packaging materials.

Messaging At The Marine Mammal Center:

- Every piece of plastic in the World will last forever
- The best action is to reduce our use of plastic by purchasing reusable materials and avoiding disposable, one-time use plastics
- Cut packing straps and six-pack rings to ensure that if they do become ocean trash they cannot entangle marine life
- Any piece of trash on land can get to the ocean, so picking up trash in parks, schools, streets, waterways and beaches help save animal’s life by keeping the trash from the ocean
- Do not release balloons into the air, as they can fly into the air and get to the oceans
Overview of Cetaceans

Cetaceans are the group of whales, dolphins and porpoises of the world. In total, there are 78 species of cetaceans. They are divided into two groups:

- Baleen whales (11 species)
- Toothed whales, including dolphins and porpoises (67 species)

<table>
<thead>
<tr>
<th>Differences Between Baleen and Toothed Whales</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baleen Whales</strong></td>
</tr>
<tr>
<td>1) Baleen plates for feeding instead of teeth</td>
</tr>
<tr>
<td>2) Eat small prey like plankton and krill</td>
</tr>
<tr>
<td>3) Do not echolocate</td>
</tr>
<tr>
<td>4) 2 Blowholes</td>
</tr>
<tr>
<td>5) Typically very large, including the World’s largest animal the blue whale at 100 ft long</td>
</tr>
</tbody>
</table>

The most common baleen whales found in California are the:
- Gray whale
- Humpback whale
- Blue whale

The most common toothed whales found in California are the:
- Harbor porpoise
- Bottlenose dolphin
- Orca
- Sperm Whale
Gray whales are named for their distinctive gray and white patterning, with each pattern unique to an individual. They are one of only three species to ever be removed from the Endangered Species list. The Eastern population (found along the US and Canadian Pacific coast) was delisted in 1994, and currently has a population between 18,000-30,000 individuals. The Western population (found Russian and Japanese coast) is listed as endangered, with less than 130 known individuals.

In the United States, we only see Eastern gray whales and all information below relates to the Eastern population.

Length: Adult: up to 50 feet long   Birth length: 14-16 feet

Weight: Adult: 80,000 pounds (40 tons)   Birth weight: 2,000 pounds (1 ton)

Range and Migration: There are two stocks of gray whales (Eastern and Western Pacific). Both prefer coastal environments.
- Eastern population (found along the US and Canadian Pacific coast)
  - Give birth in Baja California (Winter) and migrate to feeding grounds in Alaska (Summer)
  - Migrate once a year between birthing and feeding grounds
- Western population (found along the Japanese and Russian coast) are highly endangered. Little is known about their behavior and migration.

Diet:
Gray whales are baleen whales and feed on bottom-dwelling amphipods and mysids (plankton)

Life Expectancy:
Unknown, but may be up to 80 years

Mom and Calves:
- Calves are born in January-February in Baja California
- Calves remain with mothers for 8 months (through migration to feeding grounds)
- Females become sexually mature at 8 years old
At The Marine Mammal Center:

The Marine Mammal Center is a partner of the Whale Entanglement Team and is has responsible for disentangling gray whales found entangled in ocean trash along the California coast. All rescue and rehabilitation will occur in the water and not involve moving or relocating the whale.

Threats:
- Ocean trash
- Boat strikes

Around the Bay Area:

Gray whales are one of the most visible whale species. Since gray whales travel in coastal waters, whale watching is even possible from land from areas of high elevation overlooking the water.

When are they in California waters?
- December-February (moving Southward to Baja California for birthing)
- March- May (heading Northward to Arctic feeding grounds)

Best places to see gray whales:
- Point Reyes
- Point Lobos (Monterey County)
- Whale Watching Boats
  - Monterey Bay
  - SF Bay and Farallones Islands
- Gray whales have been observed from Point Bonita in the Marin Headlands!

Fun Facts:

Gray whales have the longest yearly single migration, traveling between Baja California and Alaska in one trip, roughly 11,000 miles!

Gray whales are one of only three species to ever be removed from the Endangered Species list. The Eastern population (found along the US and Canadian Pacific coast) was delisted in 1994. The others are the Eastern Stellar sea lion and various subpopulations fo Humpback whales.

They are the California state marine mammal!

Gray whales are known for having barnacles (living animals in the crustacean family) attach to their skin throughout their migrations. Some whales have been recorded at having over 400 pounds of barnacles on them at one time!

There have to be some gray whales with jaws slung to the left and others with it slung to the right, and this dictates at which angle they approach the mud to feed on amphipods. This translates to gray whales being essentially left-headed and right-headed, similar to left and right-handed people.
Humpback whales are one of the most frequently seen whales in California. The whale is named for the hump its dorsal fin, and the distinctive look of a humpback’s back before it dives underwater.

Many humpback whale species were officially removed from the Endangered Species List in the earlier 2010s. The North Pacific population is estimated at approximately 20,000 individuals.

<table>
<thead>
<tr>
<th>Length</th>
<th>Adult: up to 60 feet long</th>
<th>Birth length: 15 feet</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Weight</th>
<th>Adult: 50-80,000 pounds (25-40 tons)</th>
<th>Birth weight: 2,000 pounds (1 ton)</th>
</tr>
</thead>
</table>

Range and Migration: Humpback whales are found in all major oceans except arctic waters. Distinct populations will remain within the same ocean and display different behaviors. Within the North Pacific alone, there are three distinct populations.

- California/Oregon/Washington stock winters in Central America and migrates to the coast of California and British Columbia in Summer/Fall (these are the only ones we seen in California)
- Central North Pacific stock winters in the Hawaiian Islands and migrates to Canada/Alaska
- Western North Pacific stock winters near Japan and probably migrates to waters west of the Kodiak Archipelago (the Bering Sea and Aleutian Islands) in Summer/Fall.

Diet:
They are baleen whales and feed primarily on small crustaceans like krill, plankton, as well as schooling fish (herring, anchovies, sardines)

Life Expectancy:
Approximately 50 years

Mom and Calves:
- Calves are born in December-February in low latitudes
- Calves remain with mothers for 6-10 months
- Females become sexually mature at 6-10 years old

Threats:
- Ocean trash
- Boat strikes
At The Marine Mammal Center:

The Marine Mammal Center has been responsible for caring for numerous humpback whales in our history. “Humphrey” was rescued twice. In 1985, he swam into San Francisco Bay and then up the Sacramento River. Five years later, Humphrey returned and became stuck on a mudflat in San Francisco Bay near Candlestick Park. He was pulled off the mudflat with a large cargo net and the help of a Coast Guard boat. Both times he was successfully guided back to the Pacific Ocean. Since leaving the San Francisco Bay in 1990 Humphrey has been seen only once, at the Farallones Islands in 1991.

In 2005, The Marine Mammal Center, working alongside the Whale Entanglement Team, was responsible for successfully disentangling a free swimming whale at the Farallones Islands. A 50-foot humpback whale, named Lucky, was entangled in crab fishing lines. The story was the inspiration for the award-winning children’s book “Eye of the Whale” by Jennifer O’Connell.

In May 2007, two humpback whales wandered into the San Francisco Bay and swam 75 miles inland up the Sacramento River. We determined that one was an adult female (dubbed “Delta”) and the other was her calf (called “Dawn”). Both whales had fresh wounds on their bodies from a boat strike. With the help of government agencies and other organizations, we gave them a dart injection of antibiotics (the first time this had ever been done to a whale in the wild!). The next day they started moving south again into saltier water and appeared to feel much better, as Dawn was seen breaching out of the water multiple times. Both whales swam out under the Golden Gate Bridge back into the Pacific Ocean.

Around the Bay Area:

Humpback whales regularly migrate through California waters and are visible by boat offshore.

When are they in California waters?
- Late April-November, with peak numbers occurring in the summer months

Best places to see humpback whales:
- Whale Watching Boats
  - Monterey Bay
  - Farallones Islands

Fun Facts:

Males sing complex songs while on wintering grounds in Hawaii, which can last up to 20 minutes and be heard 20 miles away!

In the Pacific, humpbacks migrate seasonally from Alaska to Hawaii--they can complete the 3,000 miles trip in as few as 36 days!

Humpback whales have the longest flippers of any animal, with each flipper measuring 15 feet long!

Each humpback whale has a unique pattern on their fluke, which can be used to identify specific individuals!
Blue Whales

Blue whales are the largest animal ever to have lived on Earth. The whale is named for their gray coloring that appears light blue when in the water.

Blue whales are listed as endangered under the Endangered Species Act, with an estimated population of approximately 5,000 individuals (2,500 in the North Pacific).

**Length:** Adult: up to 108 feet long (more common 80-90 feet)     **Birth length:** 23 feet

**Weight:** Adult: 330,000 pounds (16 tons)     **Birth weight:** 5,000-6,000 pounds (3 tons)

**Range and Migration:** Blue whales are found in all major oceans except polar waters. Distinct populations exist in the North Atlantic, North Pacific and Southern Ocean.

- North Pacific blue whales range from Russia and Japan to Alaska and California, down to Costa Rica in the South. There are two distinct groups within the North Pacific with one set feeding and breeding closer to Russia and Japan and others in the United States.
- The Eastern stock is believed to spend winters off of Mexico and central America, and feed during summer off the along the US Pacific coast.

**Diet:**
They are baleen whales and feed primarily on krill

**Life Expectancy:**
Unknown, but estimated to be between 80-90 years

**Mom and Calves:**
- Calves are born in December-February in low latitudes
- Calves remain with mothers for 6-7 months
- Females become sexually mature at 5-15 years old

**Threats:**
- Ocean trash
- Boat strikes
At The Marine Mammal Center:

The Marine Mammal Center has not cared for any live blue whales during its history. It is prepared to provide assistance in case of boat strike or entanglement if a distressed animal presents itself.

Around the Bay Area:

Blue whales regularly migrate through California waters and are visible by boat offshore.

When are they in California waters?
- June - October

Best places to see humpback whales:
- Whale Watching Boats
  - Monterey Bay
  - Farallones Islands

Fun Facts:

The blue whale is the largest animal to ever roam the planet. They have been recorded at over a hundred feet long. That is twice the size of a dinosaur and longer than a 747 airplane or 3 school buses!

The blue whale’s heart is the size of a car, their eye is the size of a basketball, and a small child can swim through their arteries!

Blue whales can weigh up to 200 tons. That is the equivalent of 15 school buses or 40 elephants.

A blue whale’s tongue alone weighs as much as an elephant. About 100 people can fit in a blue whale’s mouth.

Blue whales can produce sounds louder than a jet engine and can communicate with other whales up to 1,000 miles away. They are thought to be the loudest animals in the world!

A single adult eats about 4 tons of krill a day (that equates to over 20,000 hamburgers).

The spray from a blue whale's blowhole is almost as tall as a three-story building (30 feet high).

A blue whale calf at birth weighs up to 3 tons (and stretching to 25 feet). It drinks nothing but its mother’s milk and gains about 200 pounds every day for its first year.

The first ever human observed blue whale birth was in 2008 off the coast of Costa Rica!

In one gulp, the blue whale can take in 125% of its body weight of water and krill (250 tons). That is ½ a million calories!
Porpoises and Dolphins

Porpoises and Dolphins are members of the toothed whale family. There are many different species of porpoise and dolphin around the World. In California, we mostly see Harbor Porpoises, Bottlenose Dolphins and Pacific White-Sided Dolphins.

What is the Difference Between a Porpoise and a Dolphin?

Diet:
Both porpoises and dolphins feed primarily on small schooling fish (i.e. sardines, herring, and anchovies)

Life Expectancy:
Porpoises: Approximately 24 years             Dolphins: 40-50 years

Threats:
- Ocean trash
- Noise disturbance
- Malnutrition
- Trauma

At The Marine Mammal Center:

While rare, the Center has cared for both dolphins and porpoises found stranded along the California coast. Frequently, care will be provided in the field helping to guide animals out of mud or unsafe waterways (estuaries, canals, etc...).

Baker D is one of the most well-known dolphin cases at the Center. In 2004, Baker D was found stranded on China Beach in San Francisco. He was so weak; he couldn’t even swim on his own. Volunteers and veterinarians provided 24-hour care and built a sling using foam pool “noodles” to allow him to retain buoyancy. He received care for 2 months before being released with a satellite tag. He was spotted with over 100 dolphins down in the Channel Islands shortly after his release!

Garber is the most recent successful harbor porpoise patient. In 2001, Garber, a young male porpoise, was found in Crescent City on the beach suffering from malnutrition and pneumonia. After 3 months of rehabilitation, Garber was released successfully with a satellite tag and tracked between San Francisco Bay, Monterey and even Baja California!
Around the Bay Area:

Both porpoises and dolphins can be seen in shallow waters surrounding the Bay Area.

When are they in California waters?
Year-round

Best places to see dolphins and porpoises:
- Golden Gate Bridge (researchers actually use the bridge and spot harbor porpoises consistently swimming underneath)
- Whale Watching Boats
  - SF Bay
  - Farallones Islands
  - Monterey Bay

Fun Facts:

Harbor porpoises were frequently seen in the San Francisco Bay until the 1930s before disappearing. Due to World War II and the use of submarine nets in the bay to keep enemy boats away, along with an increase in environmental contaminants in the bay from increased industrialization, it is believed the harbor porpoises left and resided elsewhere. However, in the 1990s, following twenty years of the Clean Air and Water Act, harbor porpoises began reappearing in the Bay.

Today, over 600 harbor porpoises have been spotted in the Bay and appear healthy, with scientists observing both mating and birthing behaviors.

Bottlenose dolphins were the subject of the Oscar-winning documentary “The Cove” in 2009, which highlighted the slaughter of dolphins in Taiji, Japan and capture of wild dolphins for some aquariums and marine parks in the world.
Orcas, also known as Killer Whales, are the largest species of dolphin. The name killer whales derives from their history of preying upon whale species.

There are many different populations of Orcas around the world. Only one population, the Southern Residents, are considered endangered with a population of 83 individuals.

**Orca or Killer Whale**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Adult Males</th>
<th>Adult Females</th>
<th>Birth Length</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
<td>32 feet</td>
<td>28 feet</td>
<td>7 feet</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>22,000 pounds (11 tons)</td>
<td>16,500 pounds (8 tons)</td>
<td>400 pounds (1/5 ton)</td>
</tr>
</tbody>
</table>

**Range and Migration:** Killer whales are the most widely distributed cetacean species in the world and likely represent the most widely distributed marine mammal species in the world.

In the North Pacific, there are three subspecies of Orca:
- **Transients:** found in coastal waters migrating along the California, Washington and Oregon coast. Feed exclusively on marine mammals, like seals, sea lions, and whales.
- **Residents:** found in the coastal waters off of Washington State, and do not migrate dramatically from the British Columbia and North Pacific US coast. Feed primarily on salmon.
- **Offshore:** found often 9 miles offshore, migrating along the US and Canadian Pacific coast. Typically found in large pods of 20-75 individuals and feed on fish and sharks.

**Diet:**
Often geographic or population specific and varies from fish to other marine mammals to sharks

**Life Expectancy:**
Males: 30 years, with some living to 50 years  
Females: 50 years, with some living to 80-90 years
Mom and Calves:
- There is no distinct birthing season as calves have been observed year round
- Calves are nursed for at least 1 year, and may be weaned between 1 and 2 years of age.
- The birth rate for killer whales is not well understood, but, in some populations, is estimated as every 5 years for an average period of 25 years.

Threats:
- Ocean trash  
- Noise disturbance  
- Malnutrition

At The Marine Mammal Center:
The Marine Mammal Center has not cared for any live orcas during its history. It is prepared to provide assistance in case of boat strike or entanglement a distressed animal presents itself.

Around the Bay Area:
Orcas are relatively elusive to whale watching boats, but Monterey Bay provides the best viewing for Orcas in California. Occasional sightings also occur at the Farallones Islands.

When are they in California waters?
Can be seen in Monterey Bay during migrations between January & May and again in September & November

Best places to see orcas:
- Whale Watching Boats in Monterey Bay

Fun Facts:
Orcas are considered the ocean’s top predator as they have no known predators and have been observed feeding on whales, marine mammals, and Great white sharks!

Orcas can swim up to 30 miles an hour in search of food! That is 6 times faster than the fastest human swimmer!

Different populations of orcas exhibit signs of culture (i.e. distinct language and accents, along with behaviors only conducted by orcas in those regions)
- Orcas in the Antarctic have been observed working collectively to wash seals off of ice floats by creating a wave of water as they dive below the ice float
- Orcas in Argentina have been observed beaching themselves when feeding on sea lion pups!

Orcas were the subject of the documentary “Blackfish” in 2012, which highlighted the history of orcas in captivity, reports of human injuries due to orcas in captivity and adverse health effects for orcas living in a captive environment.
Sperm Whales

Sperm whales are the largest animals in the world with teeth. The whale is named for the fluid located in their head called spermaceti oil (which was originally believed to be sperm by hunters) that regulates the whale’s buoyancy.

Sperm whales are listed as endangered under the Endangered Species Act, but estimates of their population are widely unknown. Despite during commercial whaling where an estimated 1,000,000 million sperm whales were killed, sperm whale numbers appear to be one of the most abundant of the large whale species.

**Length:** Adult males: 60 feet  
**Weight:** Adult males: 90,000 pounds (45 tons)  
**Range and Migration:** Sperm whales are found in all major oceans except polar waters. Sperm whale migrations are not as well identified as other whale species as it appears some whales migrate seasonally (whales move towards the poles in the summer), while other whales do not exhibit a seasonal migration.

**Diet:**  
They are the largest of the toothed whales and feed primarily on large squid, but will also feed on sharks, rays, and fish.

**Life Expectancy:**  
Unknown, but females physically mature around 30 years old and males mature about 50 years old

**Mom and Calves:**  
- Calves are born in the summer in low latitudes (close to the equator)  
- Females become sexually mature at 9 years old and produce a calf only once every 5 years  
- Most females will form lasting bonds with other females of their family, and on average 12 females and their young will form a family unit. While females generally stay with the same unit all their lives, young males will leave when they are between 4 and 21 years old to join other units for mating

**Threats:**  
- Ocean trash  
- Boat strikes
**At The Marine Mammal Center:**

The Marine Mammal Center has not cared for any live sperm whales during its history, but has studied sperm whales that have passed away. In 2008, a 51-foot adult male sperm whale was found washed ashore in Point Reyes. Upon necropsy, Center scientists identified over 450 pounds of trash found in his stomach causing his death. The trash was used to create the Ghost Net Monster, an art exhibit featured at The Marine Mammal Center hospital to raise awareness of the dangers of ocean trash to marine mammals.

**Around the Bay Area:**

Sperm whale are not the most common sight due to their diving behaviors, but can be seen in California and are visible by boat offshore.

**When are they in California waters?**

Sperm whales are found year-round in California waters, but they reach peak abundance from April through mid-June and from the end of August through mid-November.

**Best places to see sperm whales:**

- Whale Watching Boats to the Farallones Islands

**Fun Facts:**

Sperm whales can dive over 5,000 feet and stay underwater for over an hour at a time!

The sperm whale is the largest animal in the world with teeth!

The sperm whale is distinguished by its extremely large head, which takes up to 25 to 35% of its total body length.

Sperm whales have the largest brain of any animal (on average 17 pounds)!

The fictional whale featured in Herman Melville’s book Moby Dick was a sperm whale.

Sperm whales only have functional teeth on their lower jaw, not on their upper jaw.
The vaquita, meaning “little cow” in Spanish, is a small species of porpoise found only in the Gulf of California in Mexico. It is the smallest species of cetacean (group of whale, dolphins and porpoise) and also the most endangered species of marine mammal in the World. As of 2017, the population is less than 30 individuals, a decline of over 92% since 2007.

Length: Adult: up to 5 feet long  Birth length: 2 feet long

Weight: Adult: 121 pounds  Birth weight: 17 pounds

Range and Migration:
Vaquitas are non-migratory and live entirely within a 2,000 km² area in the northern Gulf of California, Mexico.

Diet:
Vaquita feed on squid, fish, and crabs

Life Expectancy:
Unknown, but may be up to 22 years

Mom and Calves:
• Calves are born in the spring (11-month gestation period)
• Calves remain with mothers for 6-8 months
• Females most likely produce one calf every two years

Threats:

Illegal fishing
The rapid fall of the vaquita is in large part due to a rampant illegal trade in an endangered fish species called the totoaba. The totoaba is a large bass-like fish that grows to 6 feet long and weighs up to 300 pounds. The totoaba is in high demand for its swim bladder, a highly prized organ as a traditional health food in China. Swim bladders are dried and smuggled out of Mexico, often through the United States, to China where a single swim bladder can be sold on the black market for tens of thousands of dollars. The totoaba is being caught using gill nets, which also accidently trap and kill the endangered vaquita.

Unsustainable shrimp fishing
Similar to the gill nets being used to catch the totoaba illegally, shrimp fisherman in Mexico also used gillnets to catch shrimp and sold it to markets around the world. Vaquitas can easily become entangled in gill nets as bycatch and drown. These nets were in large part responsible for a large decline of the vaquita population in the late 1990s and early 2000s.
At The Marine Mammal Center:

The Marine Mammal Center has been a key partner in recovery efforts to save the Vaquita. The Center works closely with the Comité Internacional para la Recuperación de la Vaquita (International Committee for the Recovery of the Vaquita), an international team of scientists established by the government of Mexico and known by its Spanish acronym CIRVA. Through CIRVA, the Center provides administration support for efforts such as population surveys and the development of alternative fishing gear. With the leadership of Dr. Francis Gulland, the Center’s senior scientist and member of the federal Marine Mammal Commission, the Center also has also has assisted provided technical support and training in the investigation of mortality events, including performing necropsies on vaquitas found dead in the Gulf of California. The Center has also signed letters to the US, Mexico and Chinese governments to crack down on the illegal totoaba trade, and has assisted in facilitating the distribution of photographs of illegal fishing in the Vaquita refuge to encourage the Mexican government to act.

In addition to more active recovery efforts, the Center works to raise public awareness and funding for vaquita conservation. Various staff have participated in the production of a feature film from Wild Lens Inc. focusing on the Vaquita called Souls of the Vermillion Sea. As part of the Seafood Watch program, the Center has also been promoting the role consumers have in buying sustainably caught seafood and encouraging guests to avoid gillnet-caught shrimp from Mexico.

Conservation Efforts:

In 2005, the Mexican Ministry of the Environment declared a Vaquita Refuge that contains approximately 80% of the vaquita population and limits fishing within the area.

In 2015, the Mexican government announced an immediate 2-year emergency gillnet ban within the vaquita habitat. A few months later 2015, the gill net ban was extended permanently. To compensate local fisherman for lost income, the Mexican government provided over $70 million in subsidies. In order to enforce the ban, Mexico authorities enlisted the Navy to patrol the refuge and utilized drones and satellite technology to locate and identify illegal fishing activity.

In 2016, with the population continuing to decline due to illegal fishing, CIRVA announced a plan to try and capture the remaining vaquita and place them in a captive setting. While capture efforts were ultimately unsuccessful, efforts remain to protect this species from going extinct.

“Fun” Facts:

The Vaquita is the most endangered marine mammal in the World, with a population estimated in 2015 at just 60 individuals. Only 4 species of marine mammal have become extinct since 1700: the Steller sea cow, Caribbean monk seal, Japanese sea lion and Chinese River Dolphin, or Baiji.

The Vaquita was only discovered and classified in 1958!

The Vaquita is the only porpoise species adapted to living in warm water.

Vaquitas have the smallest geographic distribution of any whale, dolphin or porpoise in the World.
Southern sea otters are not frequently rescued by The Marine Mammal Center, but will be rescued in the case of stranding.

Southern sea otters are listed as threatened under the Endangered Species Act, with a population of approximately 3,190 individuals.

**Physical Characteristics:**

![Image of a Southern Sea Otter]

- **Weight:** Adult males: 60-80 pounds  
  Adult females: 40-55 pounds  
  Birth weight: 3-5 pounds

- **Range:** Coastal, non-migratory
  - Live in kelp forests in Monterey Bay and Big Sur

- **Diet:**
  Shellfish (mussels, clams, crabs) and bottom-dwelling invertebrates like urchins, abalone and octopus

At the Center, otters can be fed up to 50% of their body weight a day (approx. 30 pounds of food!), including shrimp, squid, clams, mussels and herring.

- **Life Expectancy:**
  Males: 10-15 years  
  Females: 15-20 years

- **Mom and Pup:**
  - Pups can be born any time of year, but most are born from October-January, with a second peak from March to May. Twins have rarely been documented.
  - Pups drink mom’s milk for 2 months, and then spend 4 additional months with mom learning how to groom their fur, eat, and use tools.
  - Females mate following weaning pup (1-2 months delayed implantation within 6-month total gestation)
At The Marine Mammal Center:

Sea otters are extremely difficult to rehabilitate. The Center will care for adults, but due to the complexity of behaviors young sea otters must learn from their mother. The Center partnered with the Monterey Bay Aquarium in 1997 for sea otter pup rehabilitation.

The Marine Mammal Center will rescue sea otters, and depending on the animal’s age will be transferred to the Monterey Bay Aquarium (for all pups) or to the hospital in Sausalito (animals that are 6 months or older). The Monterey Bay Aquarium’s captive otters are trained as surrogate otter mothers and are able to teach abandoned pups complex behaviors such as feeding and grooming. Once the pups are healthy and capable of living on their own, they are released to the wild.

In 2017, the Center retrofitted two pens to care for juvenile and adult pups. While not common patients, the Center could have up to four sea otters onsite at one time.

In 2017, the Center was the first to successful treat domoic acid toxicosis in sea otters, and utilize an implanted life history tag to track a patient’s health over the course of their entire lifetime.

In total, The Marine Mammal Center has been responsible for responding to over 350 otters since 1975.

Common Ailments:
- Maternal separation
- Malnutrition
- Toxoplasmosis (a parasite spread through cat feces)
- Domoic acid toxicosis
- Shark Bites
- Parasites
- Oil Spills

Around the Bay Area:

Sea otters will only normally be found in the Monterey and Big Sur areas. The public can easily view otters at Elkhorn Slough in Moss Landing, Monterey harbor (near the Monterey Bay Aquarium), or in San Luis Obispo at places like Morro Rock.

Sea otters can also be seen in captivity at the Monterey Bay Aquarium

Fun Facts:

The otter is the furriest animal on the planet, with one million hairs per square inch (that is the size of a quarter). That is like the number of hairs on more than 10 human heads just one square inch of an otter’s fur!

Sea otters actually aren’t related to seals and sea lions. They are the largest member of the weasel family.

The otter is the smallest marine mammal!

In the 1800s, sea otters in California were hunted almost to extinction for their beautiful fur. Their population was estimated at less than 100 individuals before being granted protection. Today, their population numbers just over 3,000 individuals.

Sea otters eat approximately 25-30% of their body weight daily!

Sea otters have no blubber, so they use their fur to stay warm and dry. Otters will blow air under their fur to help insulate themselves.

Sea otters use tools to break open their food. They have been seen using rocks, and even ocean trash like bottles and cans, to crack open shellfish.
Where to See Wild Marine Mammals In and Near the Bay Area

Harbor Seals and California Sea Lions:
Range: Up and down the entire California coast slightly offshore
Locations: PIER 39 (San Francisco) Seal Rock (San Francisco)
Point Reyes National Seashore Año Nuevo State Reserve
Bean Hollow (San Mateo County) Bolinas Lagoon
Point Lobos State Reserve Farallones Islands
Monterey Peninsula Sonoma Coast State Beaches

Elephant Seals:
Range: Up and down the entire California coast
Locations: Año Nuevo State Reserve (San Mateo County)
Point Reyes National Seashore
Piedras Blancas (near Hearst Castle in San Luis Obispo County)

Dolphins and Porpoises:
Range: In California and San Francisco Bay
Habitat: Mostly shallow water, coastal
Locations: From Golden Gate Bridge
San Francisco Bay
Farallones Islands

Gray Whales:
Range: Along the California coast from December through March (peaks in January during south migration, March during north migration)
Habitat: Offshore coastal waters, within the continental shelf
Locations: Bodega Head State Park Farallones Islands
Monterey Peninsula Point Lobos State Reserve
Point Reyes National Seashore

Blue Whales, Humpback Whales, and Sperm Whales:
Range: In California (generally summer and fall)
Habitat: Deeper, further offshore water
Locations: Farallones Islands and surrounding area
Cordell Bank National Marine Sanctuary (offshore Sonoma County)
Monterey Bay and Canyon

Sea Otters:
Range: Half Moon Bay south to San Luis Obispo, sightings as far north as Pt. Reyes
Habitat: Among kelp beds just offshore or shallow intertidal areas
Locations: Montana de Oro State Park
San Luis Obispo County (Morro Rock)
Point Lobos State Reserve
Elkhorn Slough
Marine Mammals in the Bay Area

San Francisco Zoo (California sea lions, including former TMMC patients)

Both of the California sea lions (Henry and Silent Knight) at the SF Zoo are former patients of The Marine Mammal Center and transferred to the SF Zoo in 2011 when they built a new enclosure for sea lions. Henry was rescued as a one year old due to severe malnutrition. After rescue, it was determined that Henry was blind and not suitable for release. Silent Knight is an adult sea lion weighing approximately 450 pounds upon rescue that was found in Sausalito with numerous gunshot wounds to the face. The gunshot wounds left Silent Knight permanently blind, and therefore not suitable for release. Both animals are quite healthy at the zoo despite their visual deficits.

Six Flags Discovery Kingdom, Vallejo (Sea lions, including former TMMC patients, harbor seals, walruses and dolphins)

Six Flags is an amusement park and zoo. They have numerous marine mammal species, ranging from seals and sea lions to walruses and dolphins. In 2009, The Marine Mammal Center rescued an adult sea lion named Sergeant Nevis weighing 500 pounds that was found up the Sacramento Delta with a shotgun wound to the nasal cavity. The shotgun left a large open wound preventing Sergeant Nevis from being able to dive in the water column. He was treated, and the recipient of the first known facial reconstructive surgery on a sea lion, but was not suitable for release. He was transferred to Six Flags in 2010. Six Flags also has numerous harbor seals, walruses, and dolphins that the public can see and pay extra to interact with. “Shows” are performed daily for the public involving marine mammals.

Monterey Bay Aquarium (sea otters)

The Monterey Bay Aquarium is famous for numerous reasons, but their sea otter exhibit is world-renowned. Not only do the otters give the public the opportunity to see sea otter behavior up close, but they are part of the Sea Otter Research and Conservation Program (SORAC) and serve as “Foster Mother Otters” to sick and abandoned sea otter pups. Pups are rehabilitated behind the scenes with one of the exhibit otters until healthy and then the pup is released and the foster mother otter is placed back in the exhibit for the public to see.

Not a marine mammal, but...

River otters can also be seen at the Aquarium of the Bay (at PIER 39), Six Flags Discovery Kingdom and San Francisco and Oakland Zoos.