

Año Nuevo

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What to Bring.

- Bring warm clothes and rain gear. No umbrellas.
- Shoes for mud.
- Bring binoculars, cameras.
- You will need money to park (\$5.00) and to cross the San Mateo Bridge (\$3.00).
- No food is available. Half Moon Bay is the last place to get food.
- It takes two hours to get there from here.

Where to Go.

- Take 580 to 238. Take 238 west to 880 south.
- Take 880 south to 92 (San Mateo Bridge).
- Take 92 to Highway 1 in Half Moon Bay.
- Take 1 south to Año Nuevo.

Año Nuevo

- Año Nuevo = new year
 - Named by the chaplain of a Spanish explorer, Viscaino.
 - Sighted on 3 January 1603.
- Ohlone Indians came here.
 - for chert (rock), used for tools, weapons, to trade
 - for fish and shellfish.
- Buildings are the remains of a dairy.
- Fields were used for brussel sprouts.
 - Returning to natural state.
- San Gregorio Fault runs through it.

Marine Mammals

- Found at Año Nuevo at various times of the year or present year round
 - Stellar sea lions
 - California sea lions
 - Harbor seals
 - Northern elephant seals
 - Pictured on the right
 - Sea otters
 - Gray whales



Classification

- Humans attempt to organize the natural world by imposing a classification system on it.
 - Based on evolutionary relationships.
 - The most closely related are placed in the same groups.
- Organism are grouped into domains, kingdoms, phyla, classes, orders, families and genera.
- The genus is the least inclusive category.

Pinnipeds.

Order *Pinnipedia*

- Streamlined, large eyes, flippers.
- Sea lions and fur seals. Family *Otariidae*.
 - Have a small external ear.
 - Can move on land using hind flippers.
- Harbor seals and elephant seals. Family *Phocidae*.
 - No external pinna.
 - Can't use hind flippers on land.

Northern Elephant Seals

- Female, 10-12 feet, 2000 lbs.
- Male, 14-16 feet, 6000 lbs. (Pictured on the right.)
- Life span--14 years for males, 20 for females.
- Formerly bred from Baja to Pt. Reyes.
- Hunted for oil--210 gallons of high quality oil from one bull.
 - Used in lighting, as a lubricant, for tanning, in paint, soap.



Recovery

- 1892, Smithsonian found 9, killed 7.
- Island of Guadalupe (off Baja), less than 100 survived.
- Now approximately 160,000.
- 1955, first seen on Año Nuevo Island.
- Now breed as far north as Pt. Reyes.

Behavior

- Dominance hierarchy--most aggressive (alpha) male mates with the most females. (Pictured on the right.)
- 4% of males inseminate 85% of the females.
- Males arrive in December at Año Nuevo.
- Females arrive several weeks later (January) and give birth to pups that were conceived the previous year. Only one pup is born per female.



Behavior, continued

- Nurse 3-4 weeks. Milk is 55% fat. (Cow's milk is 4%.)
- Female breeds (about 24 days after birth) and leaves.
- Delayed implantation of embryo. Allows female to regain weight before fetus starts to grow.
- Pup grows from 75 lbs to 250-350 lbs when weaned.
- Pup born the following year in January.

Behavior, continued

- Males demonstrate very aggressive behavior.
- Guard females and move with them along the beach.
- Chase away males that approach harem.
- May crush pups while defending harem.

Behavior, continued

- Subordinate males attempt to mate with females as they return to the sea and even with weaned pups (“weaners”), dead adults, yearlings and subadult males..
- Adults leave in March-April.
- Young stay until April-May.
- Spend most of the year at sea alone.
- One male went from San Miguel Island off Santa Barbara to Alaska twice in one year.

Behavior, continued.

- Young seals are born with dark hair which absorbs heat and helps to keep the pups warm. (Pictured on the right.) They lose this at about one month and become silvery brown.
- Adults molt in spring, summer.
- Molt is catastrophic. They lose large patches of skin and hair.



Behavior, continued.

- Swim using pelvic muscles and rear flippers. Front flippers are kept close to body.
- Can dive over 4000 ft. Depth gauges have been attached to seals.
- Dive day and night, nonstop.
- Eat squid, skates, rays, rat fish, small sharks.
- Swallow prey whole.
- Have carnivore teeth. Look at the skull on display.

Behavior, continued

- Deep feeding may explain recovery from near extinction. Few predators or competitors for food.
- Have 2 1/2 times blood of humans relative to weight and a high red blood cell density.
- Great oxygen storing capacity.
- Exhale before diving.
- Heart rate slows.

Sexual Dimorphism

- Males and females have a different appearance.
- Males have proboscis.
 - Resembles the trunk of an elephant
- Large chest shield protects male from bites by other males.
(Pictured on the right.)
- Females are smaller.



Enemies

- Sharks and killer whales. Great white sharks are found off Año Nuevo.

Thermoregulation

- Temperature regulation.
- Blubber for insulation. Hair does not insulate well at depth.
- Shunt blood away from body surface when swimming. On land, blood is circulated to the skin to radiate heat to the air.
- Coat themselves with sand. (Pictured on the right.)
 - Cooling mechanism?



Pups

- Crushed by males defending harem. Attacked by females. Drown.
- Starve if separated from mother.
- Gather in “weaner pods” possibly for protection from males after being weaned.
- Some steal milk and some are adopted by another mother to become “superweaners” who may weigh 600 lbs.

Pups, continued

- Learn to swim and what to eat on their own.
- A weaner is shown below.



The concern...

- All are descended from less than 100 individuals.
- The population lacks genetic diversity.
- Lower ability to survive changes in the environment.

Assignment:

- Visit the Año Nuevo State Reserve web site and read the sections on elephant seals and marine life. Look under “related links”.
- [Año Nuevo State Reserve web site](#)

