


Northern elephant seals of Point Reyes National Seashore

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Photo by Trish Carney

A large colony of elephant seals is resting on a sandy beach. The seals are of various shades of brown and grey, some lying down and others partially submerged in the shallow water. In the background, a rocky cliff face is visible. The word "Today..." is overlaid on the image in a large, white, serif font.

Today...

- Natural history of elephant seals
- Science of elephant seals
- How you help the elephant seals

Natural History of Northern Elephant Seals



Northern Elephant Seals (*Mirounga angustirostris*)

- Longest annual migration (they migrate twice in a year: 7,000 miles/trip = 14,000 miles in a year)
- Deep dives (> 5000 ft, avg. 900 ft)
- Males fast on land for 3 months
- Extreme sexual dimorphism



Jane Khudyakov

Northern Elephant Seals - Sexual Dimorphism



Northern Elephant Seals - Sexual dimorphism



Northern Elephant Seals - Pups

Pups (1 to ~28 days old)

- 3 – 4 ft long, 60 – 75 lbs
- black fur
- Unable to swim at birth
- Weaned after ~28 days - @ 300 lbs



Northern Elephant Seals - Weanlings

Weanlings (28 + days old)

- fur gray to silver, or black fur molting
- alone or *weanling* pods
- usually plump
- not nursing, but may steal milk



**SUPER
WEANER**
~500 LBS





Northern Elephant Seals - Yearlings

Yearling (one year old)



Characteristics:

- larger than harbor seals
- blonder, lighter fur
- smaller than others
- often scruffy fur



Northern Elephant Seals can be confused with harbor seals



Differences:

- Slightly larger than
- Fur blonder, no spots
- No nails in rear flippers
- Slightly bulbous nose
- Large eyes
- Don't flush from people

Northern Elephant Seals – Sub adult males

Sub-Adult Males - SA 2 (4- 5 years)



Characteristics:

- definite male nose - trumpets
- nose not touch sand
- no chest shield
- female size



Northern Elephant Seals – Sub adult males

Sub-Adult Males - SA 3 (6-7 years)



Characteristics:

- large nose with notch
- light scarring
- nose touch sand when head on sand
- chest shield - wrinkles on chest

Northern Elephant Seals – Sub adult males

Sub-Adult Males - SA 4 (8 years)



Characteristics:

- notched nose
- less chest shield than bull
- chest shield does not rise above eyes



Northern Elephant Seals - Bulls

Bull (9 + Years Old)

- full chest shield wraps around neck
- big heavy nose with notch
- pink chest shield increases with age
- live up to 15 years (avg = 12 years)
- 3,000 – 5,000 lbs.
- 13 ft. long



Northern Elephant Seals – Cows

Females (Cow)

- 8-10 ft. long
- 1,000 - 1,300 lbs
- No big nose
- Live up to 22 years
(avg = 16 – 18 years)
- Often with pup



Northern Elephant Seals – Cows

21 years old at PRH

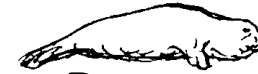


Northern Elephant Seals – Age Classes

The Who's Who Guide for Docents



Bull



Pup



Cow



SA-4



Yearling



SA-3



SA-2

Elephant Seals - Exploitation

- *Historic Range*

Historically recorded as far north as Point Reyes;
bones in middens in WA

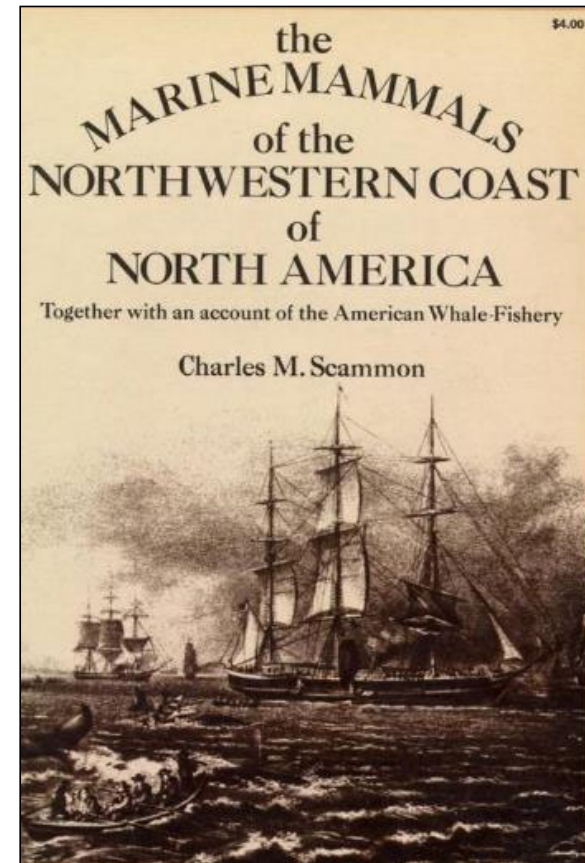
- *Scammon's naturalist notes*

25 gallons of high quality oil per bull

- *Reasons for decline*

Yearly haul outs make easy hunting

Easily approached



CLUB AND LANCE USED IN THE CAPTURE OF THE SEA ELEPHANT.

Elephant Seals – Population Recovery

- Believed extinct
- 1890: Fewer than 100 seals
- Remnant population found on Guadalupe Island
- 1922 Mexican government declared Guadalupe Island a national preserve
- Colonize Channel Is. 1950s
 - Año Nuevo 1968
 - Farallon Is 1972
 - Point Reyes 1981



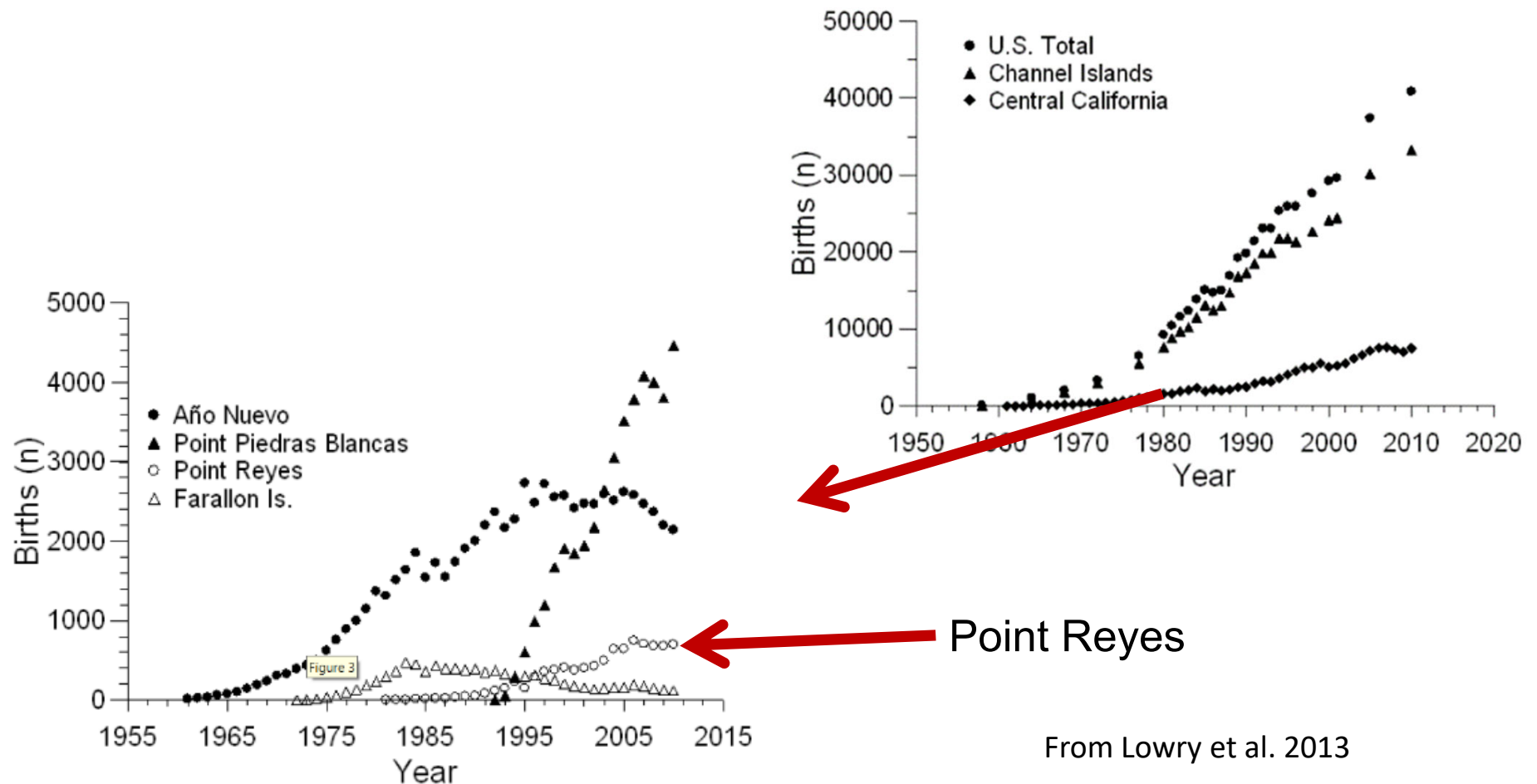
Elephant Seals – Population Recovery

Current
breeding sites
in entire range



Elephant Seals – Population Recovery

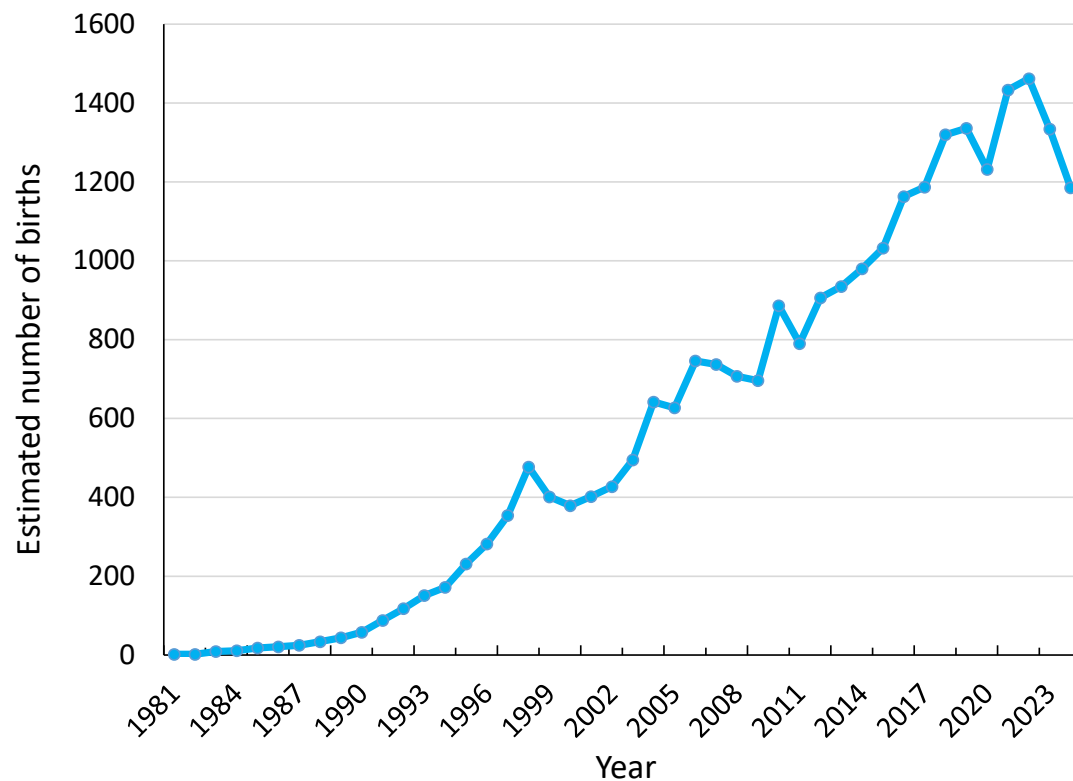
Total population estimate as of 2010: 210,000 to 239,000



From Lowry et al. 2013

Elephant Seals – Population Recovery

Population Growth at Point Reyes



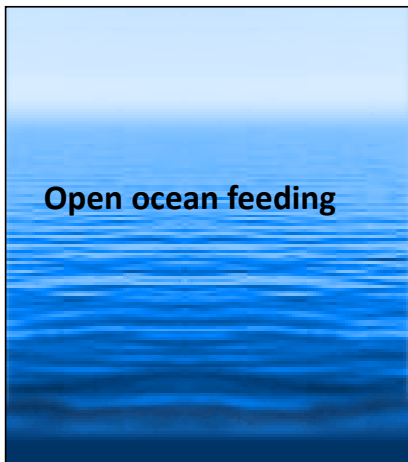
Year in the Life of an Elephant Seal



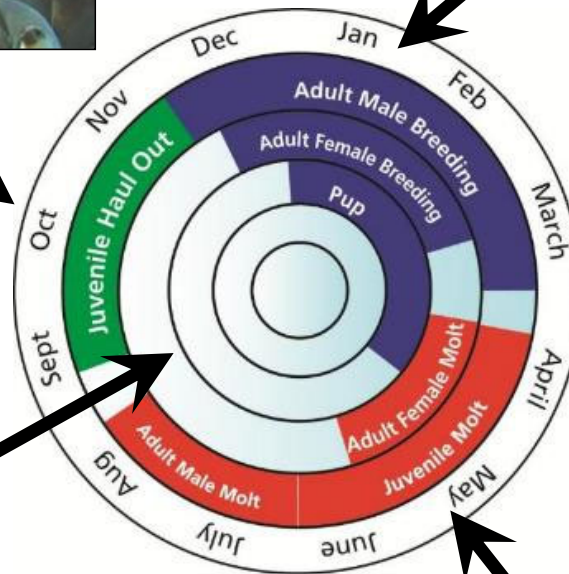
Juvenile haul out



Mating and pupping



Open ocean feeding

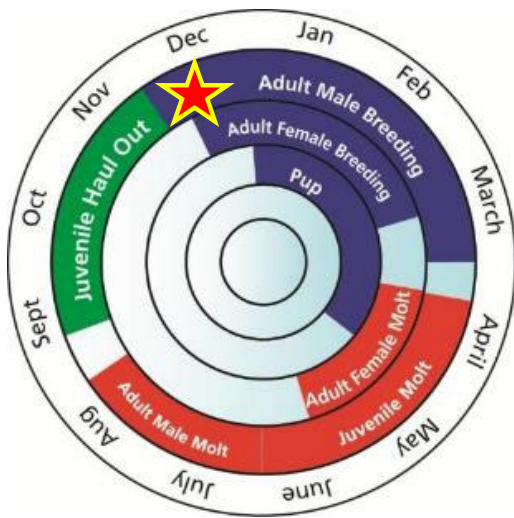


Molting haul out

Year in the Life of an Elephant Seal

Males:

Males arrive first and compete
Females arrive shortly after



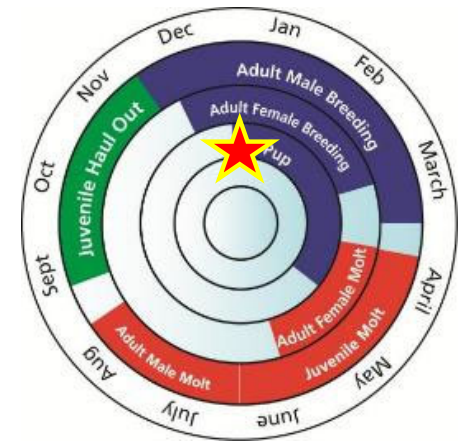


Year in the Life of an Elephant Seal



The Pupping:

- The first pups are born in mid December
- Pup and mother ~28 day relationship
- Nurse on rich milk (50% milkfat)
- Pup mortality













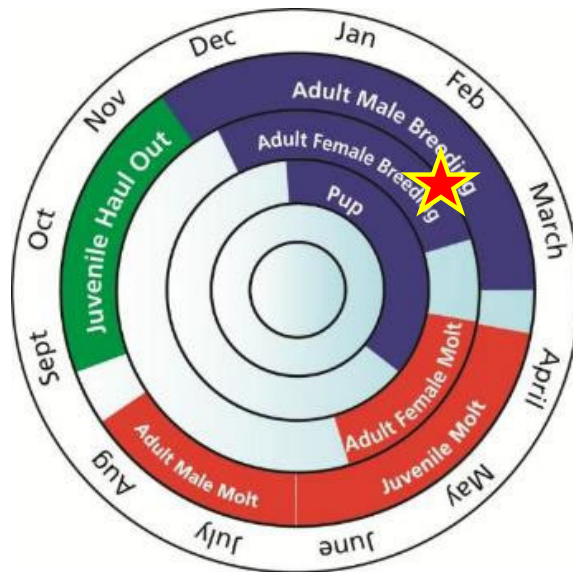




Year in the Life of an Elephant Seal

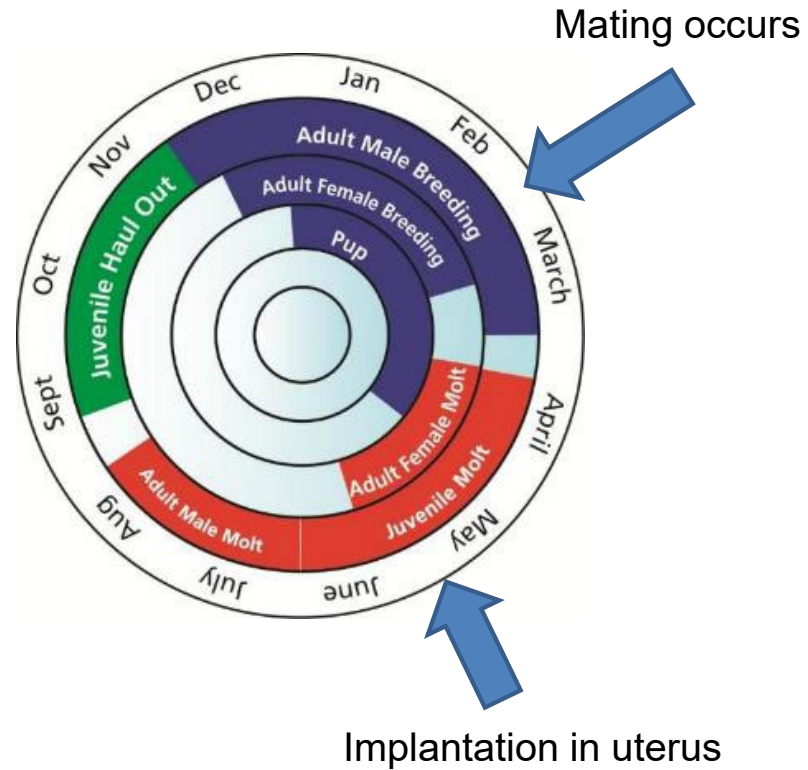
The Mating Season: Female mates 25-30 days after birth of pup

- Peak mating is mid-February
- Mating Strategies - different
- Females leave after mating
- Males leave when all females are gone

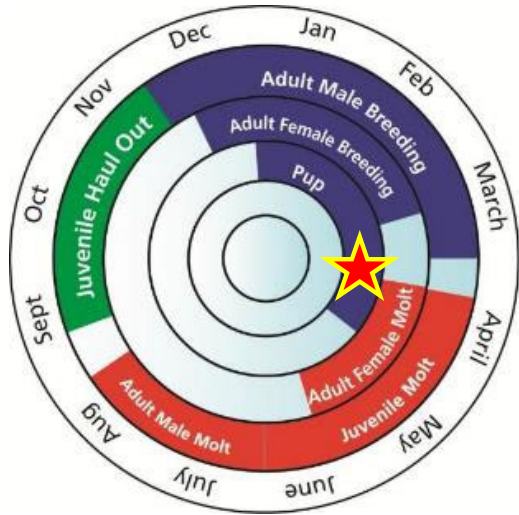


Delayed Implantation

- Egg is fertilized after mating
- Fertilized egg implants during the molt
- Why?
 - Replenish resources
 - Needs to fast during molt
 - Synchronized timing for females not onshore during breeding season



Year in the Life of an Elephant Seal



Weaned Pups – “Weanlings”

On Their Own:

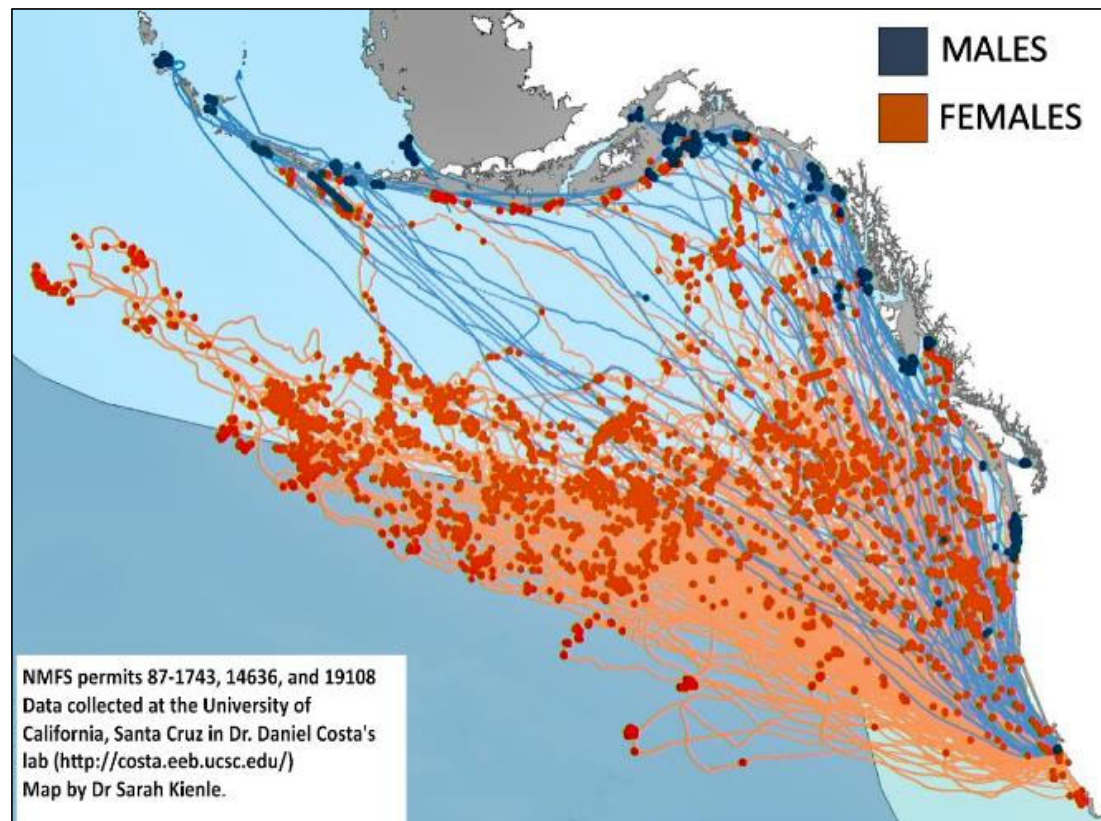
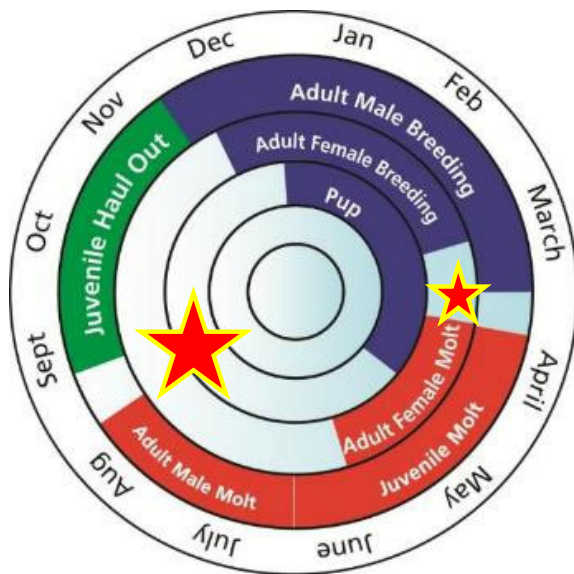
- February - April
- Weanlings live on fat stores
- Weanling Pods grow as season nears end
- Learn to swim and forage on their own



Year in the Life of an Elephant Seal

Elephant Seals Spend Most of Their Life At Sea:

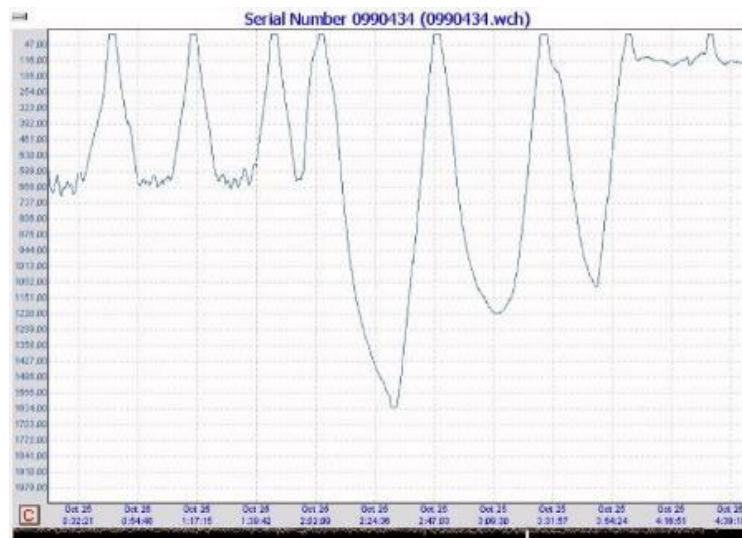
- Different Routes for Males and Females
- Travel up to 14,000 miles in 2 foraging trips per year
- Individual spends 80-90% of time at sea diving and under water



Foraging routes for males and females



Female at PRNS
GTOPP Program
<http://www.gtopp.org>



One female at Point Reyes
Dive 1600 meters (> 5,000 ft)
Traveled to Aleutians

Deep Divers

How do they dive to great depths?!

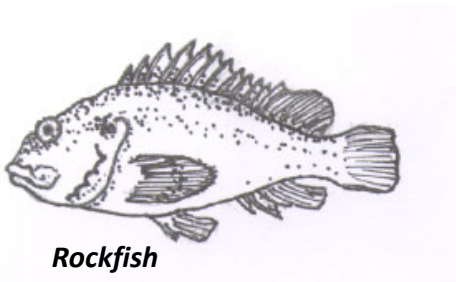
- *Exhale*
- *Store more oxygen in blood & muscle*
- *Reduce heart rate*
- *Restrict blood flow to core*
- *Blubber*
- *Pulmonary surfactant*



Year in the Life of an Elephant Seal

Elephant Seals At Sea

- Diet - Determined from stomach contents – limited
- New research on adult female seals via cameras and fatty acid analysis from blubber found they primarily feed on myctophids (ex. lanternfish)



Rockfish

- 18 inches
- Abundant
- Found between 73-640 meters



Squid

- One to six feet
- Most frequently consumed prey
- Found in deep water in large schools



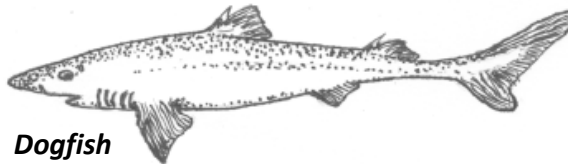
Lanternfish

- ~15 cm
- Found between 300 – 1500 meters
- Found in schools
- Vertically migrates for night feeding near surface



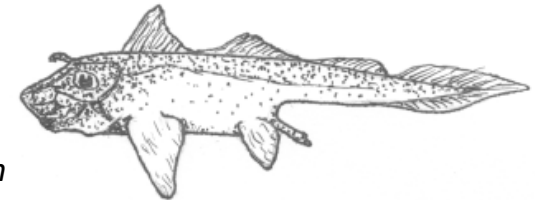
Pacific hake

- 3 feet
- Found between 183-914 meters
- Found in schools
- Vertically migrates for night feeding near surface



Dogfish

- Type of shark
- Abundant in nearshore waters
- Found at up to 950 meters
- Has sharp venomous spines on front of dorsal fin



Ratfish

- 3 feet
- Abundant
- Found between 92-913 meters

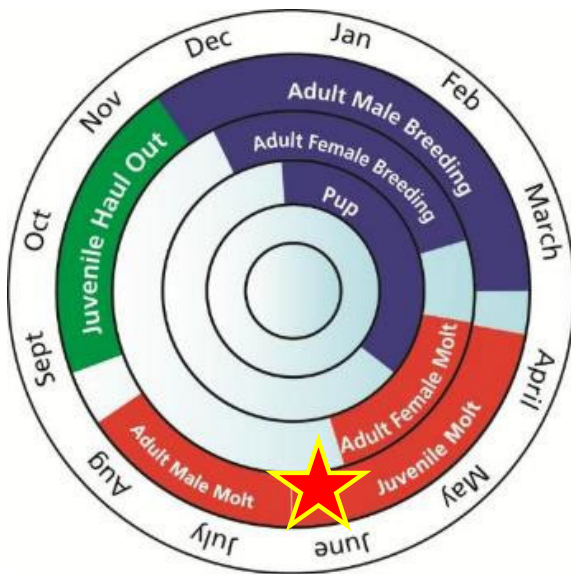
Predation



Year in the Life of an Elephant Seal

Molting: Returning to Land

- April through July depends on sex and age
- 3-4 week process
- Blood flow to skin require seals to haul out
- Catastrophic molt - all skin and hair is shed at one time



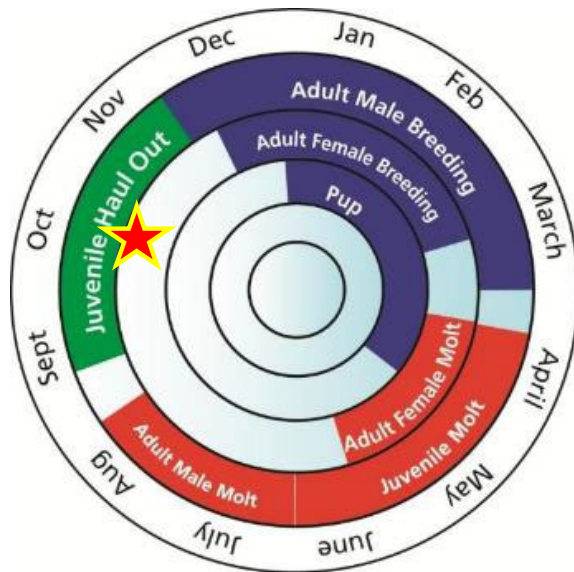
Year in the Life of an Elephant Seal

Juvenile Haul Out

- September through November
- Males play fighting

Possible reasons:

- Needed for bone development
- Bi-annual haul out



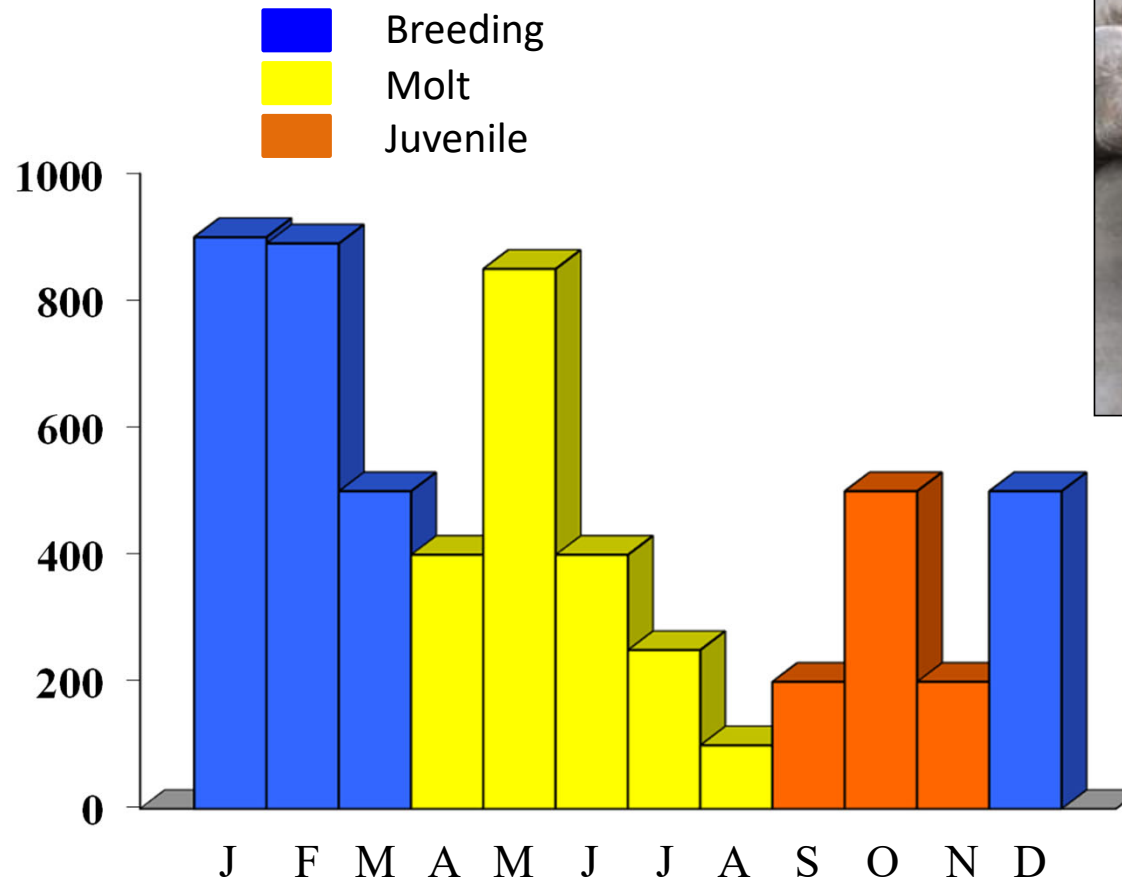
Sand Flipping

- Thermoregulation
 - Sunscreen
- Skin reliever
- Natural tick



Year in the Life of an Elephant Seal

By month



Break Time??



Science of Seals

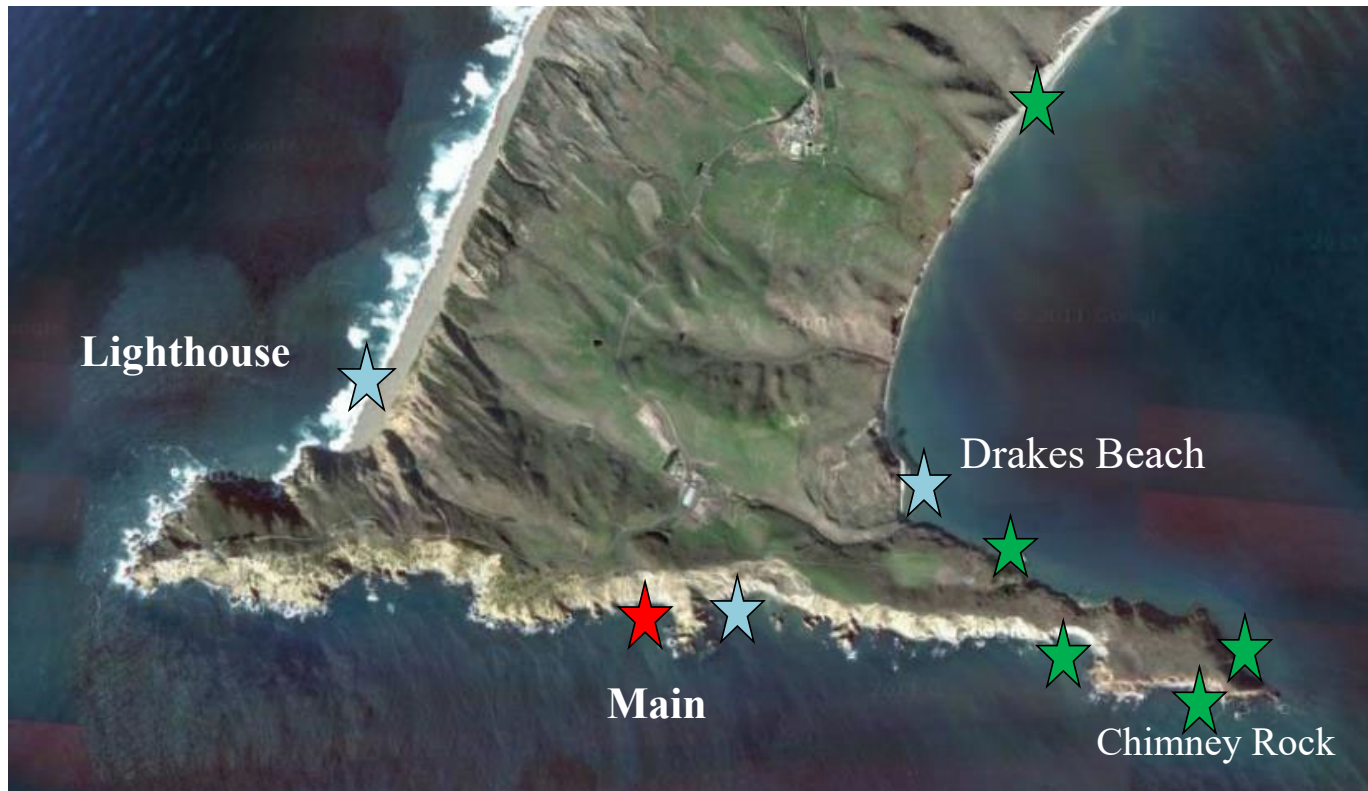
Monitoring Objectives

- Determine population trends
- Identify natural range of variation in seal numbers from year to year
- Identify potential causes for change in seal numbers
- Identify new colonies as population expands

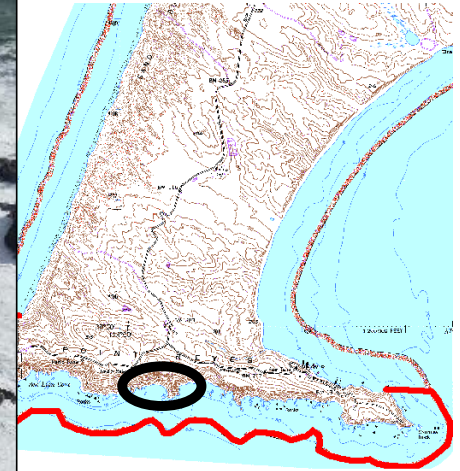


Point Reyes Elephant Seal Colonies

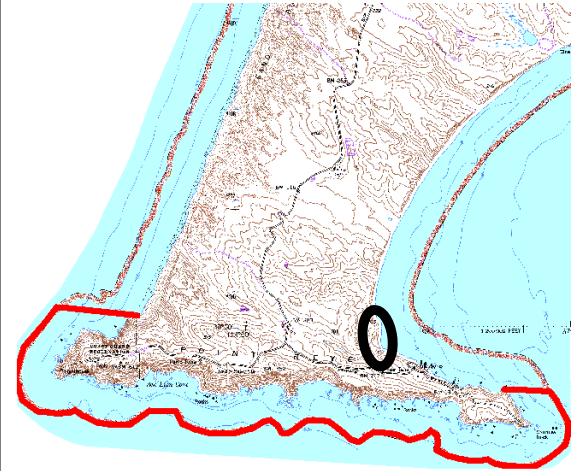
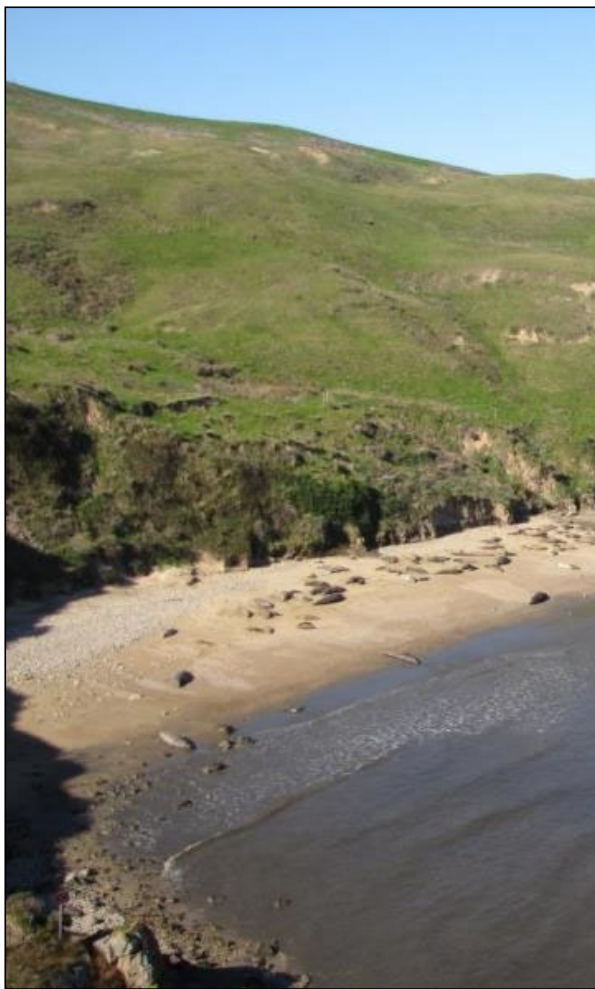
Colonized in 1981, continues to expand



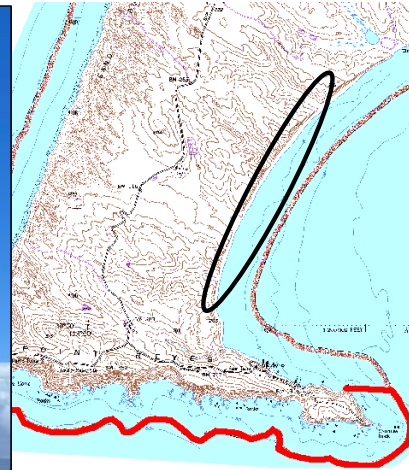
Elephant Seal Breeding Sites – Main Colony



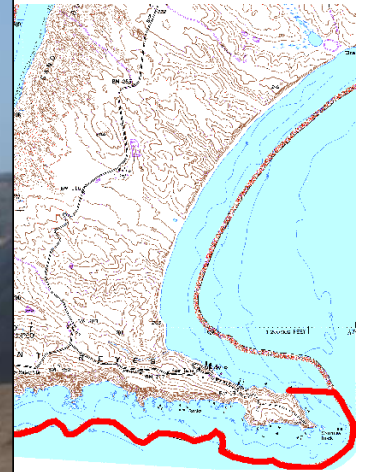
Elephant Seal Breeding Sites – Drakes Beach 1



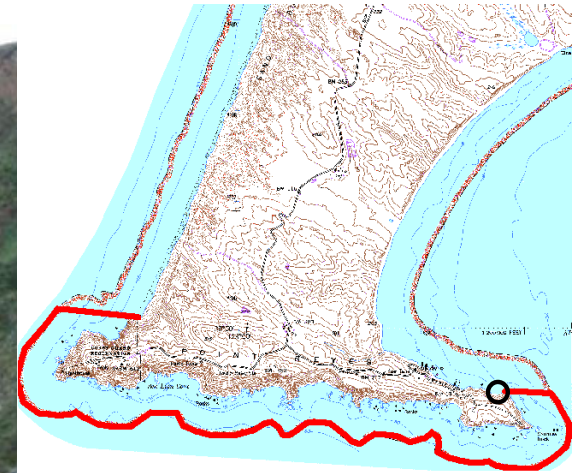
Elephant Seal Breeding Sites – Drakes Beach 2



Elephant Seal Breeding Sites – South Beach



Elephant Seal Breeding Sites – Gus' Cove

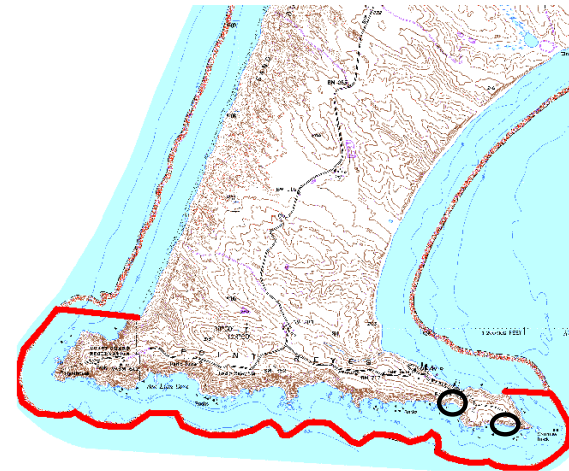


Elephant Seal Breeding Sites – Chimney Rock

Chimney Rock
Cove - West



Chimney Rock
Cove - East



Elephant Seal Breeding Sites – Fish Dock



Elephant Seal Breeding Sites – Lifeboat Station



Monitoring Methods



Photo: Daniel Dietrich, NMFS Report No. 12152-002



Monitoring Methods – Flipper Tags



Drill Pattern:

P R H J K M_{or} M N L S V W X Z

1 2 3 4 5

6 7 8 9 10



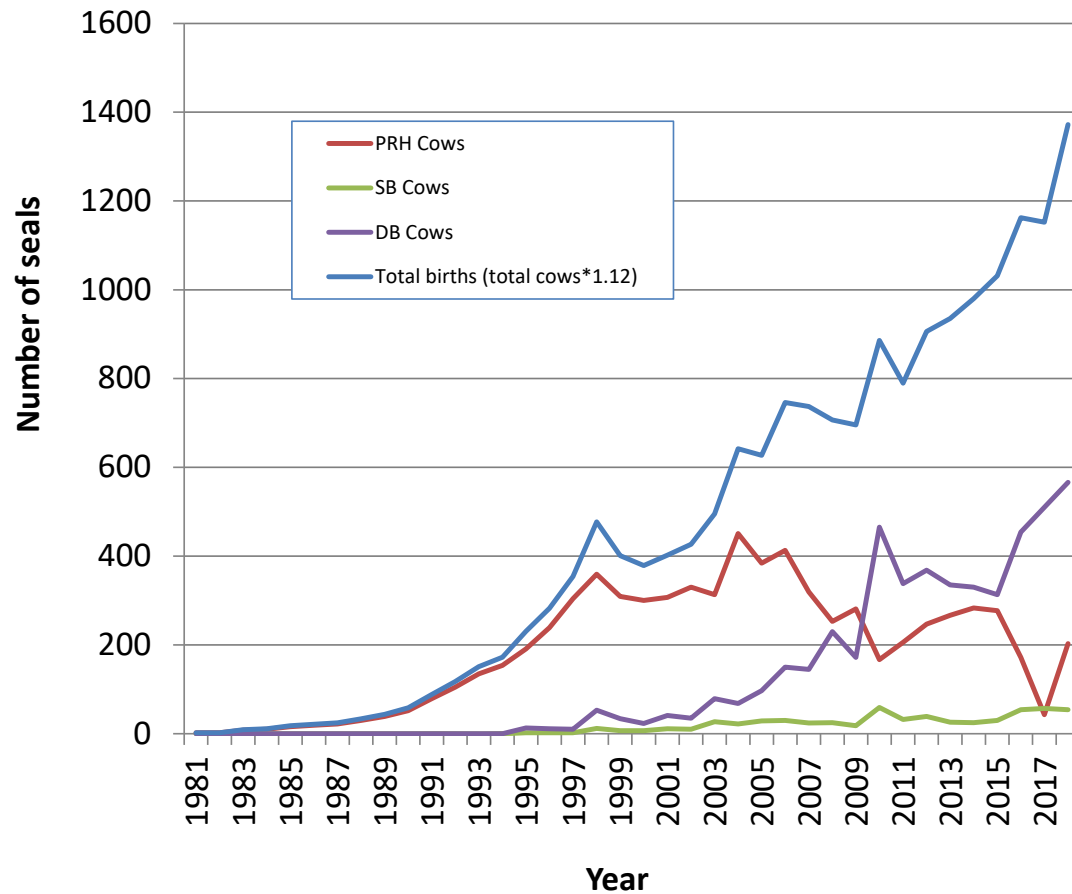
Monitoring Methods – Dye Marks



D = Drakes Beach
S = South Beach
F = Fish Dock
G = Gus' Cove
V = Visitor Center



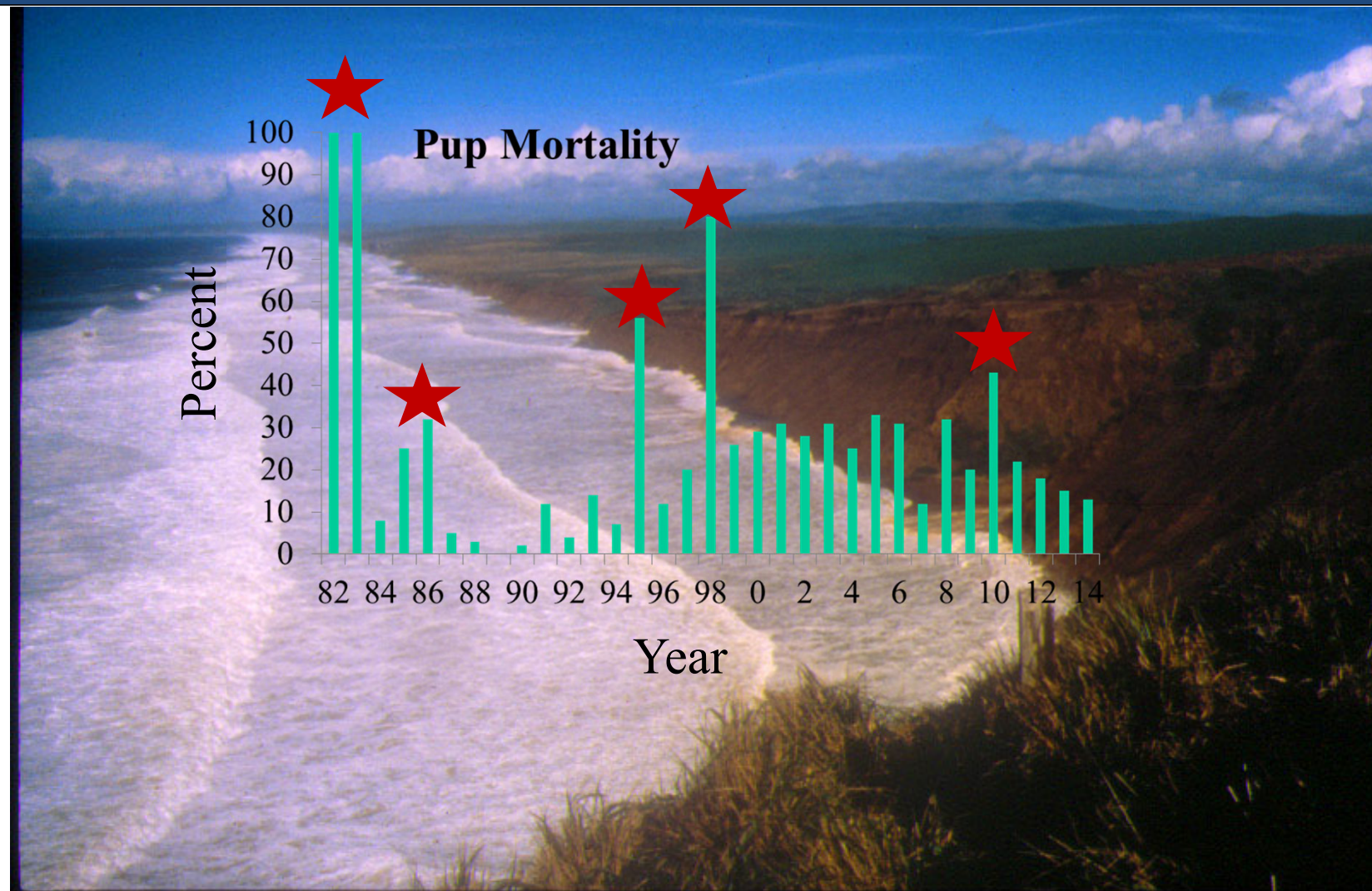
Growth rate at Point Reyes varies by subsite



Sub-colonies grew at different rates as seals colonized new areas



Weather

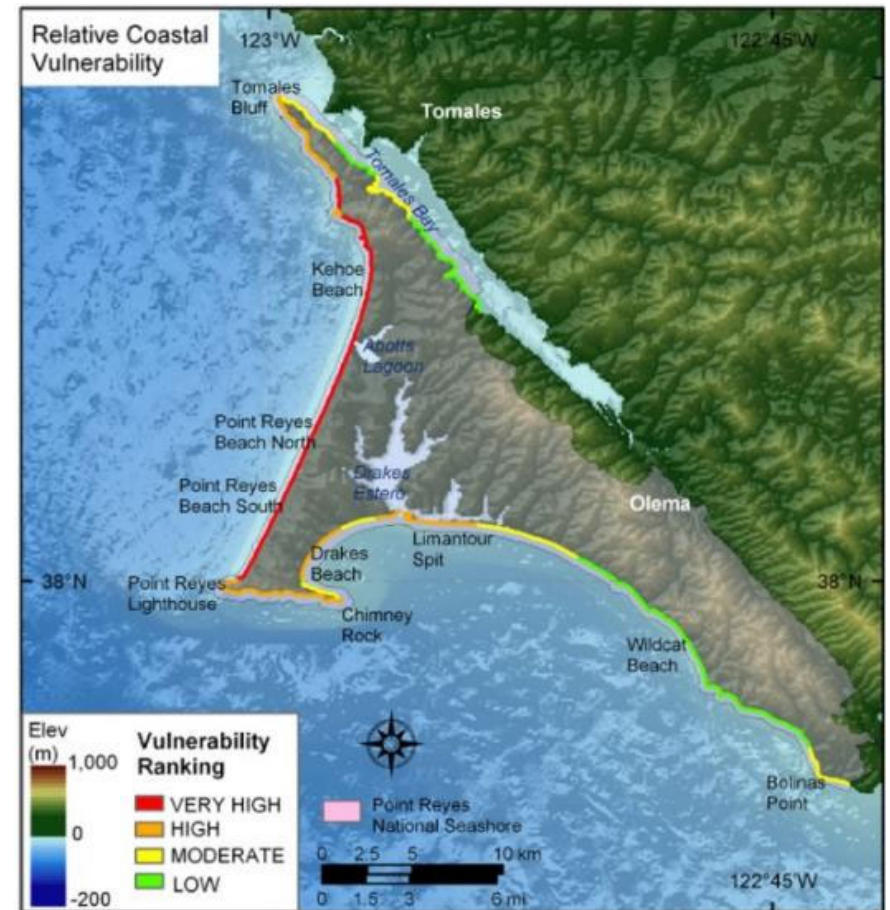




Climate change – predicted to....

- Higher sea level
- Higher air temperature
- More frequent El Niños

<http://coastalmap.marine.usgs.gov/>

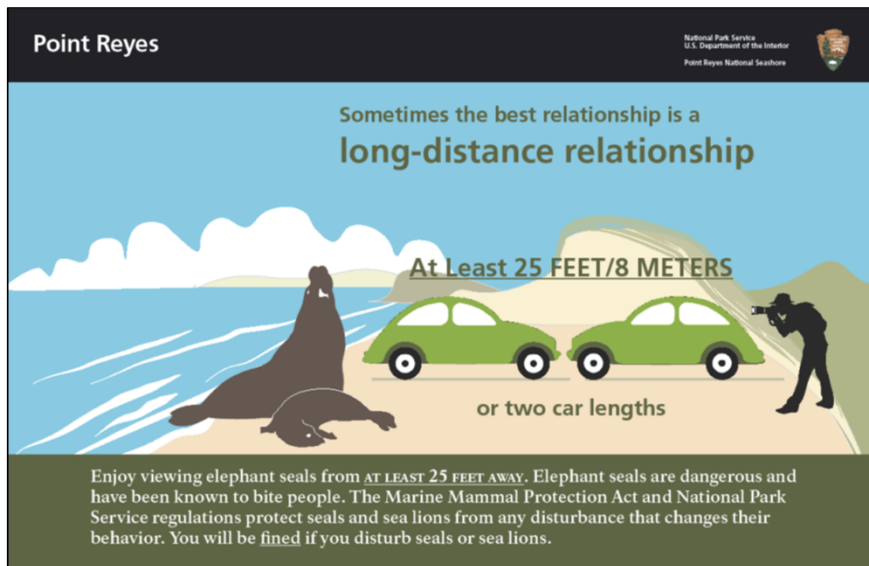


Visitor and Seal Safety



Docents

- MMPA guidelines – no rule for the distance
 - But PRNS rule is 25 ft from elephant seals
- Encourage people to give the seals a wide berth as they walk on the beach
- At least 25 ft at Drakes Beach, but set up flags for 50 ft, when possible





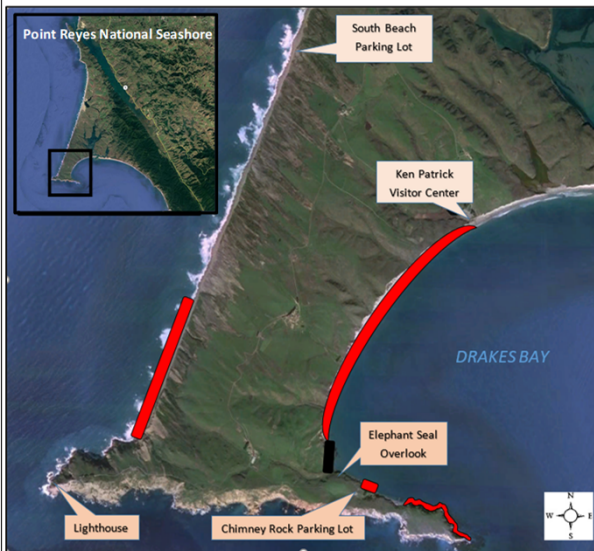
Closures

Point Reyes National Seashore
National Park Service
U.S. Department of the Interior

BEACH RESTRICTIONS

Beach restrictions are in effect during the northern elephant seal pupping season, December 15 – March 31, to minimize seal disturbance. If you come across an elephant seal outside of the closure, please remain 25 feet (or 2 car lengths) away from the seal.

-  Beaches temporarily closed, December 15 – March 31
-  Beach permanently closed year-round



Drakes Beach seasonal closure, but entire beach may be closed if necessary



Pinniped Strandings

Decision Criteria

- $\frac{1}{4}$ - $\frac{1}{2}$ mile from parking lot
- Will it be bothered by a lot of people/dogs?

Exceptions

- Threatened and endangered species
- Direct human cause (ex. entanglement)

Why leave it be?

- Stress from handling the animal is not worth it
- Remove food source for scavengers
- This is a National Park Service site and the preference is for nature to take its course



Thanks!



NPS Photo/Matt Lau