Strandings

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Outline

- Who strands
- Why they strand
- Dead animals
  - Carcass codes
- Live animals
  - Clinical effects
- Response

Who strands?

- Most strandings are dead animals
- Cetaceans (mass or individual), pinnipeds, sea otters, manatees, or sea turtles

- Pinnipeds, sea otters, and sea turtles may be found on land normally at certain times
  - Female sea turtles only (nesting)

- Manatees can beach themselves "on purpose" to avoid mating herds
- Cetaceans never on land normally
  - **Always an emergency**

Cetaceans

- Mass stranding (>2 animals)
  - Odontocetes only
    - Pilot whales
    - Many other species
  - Observed by Aristotle!
  - Occur worldwide
  - Unknown causes, but many theories

Possible causes

- Navigational errors
  - Geomagnetic disturbances
  - Loss of sonar d/t parasitic infections
    - 8th cranial nerve destruction by *Nasitrema* in inner ear – controversial
  - Unfamiliar shorelines
- Social cohesion
  - Healthy animals follow sick ones
  - Response to distress calls

Contributing factors

- Environmental
  - Storms
  - Topography
  - Currents, tides
  - Acoustic disturbance
    - Volcanoes
    - Military operations
  - El Niño/La Niña
  - HABs
  - Oil spills/pesticide runoff
  - Food availability
- Animal
  - Social bonds
    - Cow-calf pairs
  - Breeding season
  - Infectious diseases

Individual strandings

- Injured animals
  - Entangled
  - Infected wounds (entanglement, boat strike)
  - Interspecific or conspecific aggression
- Ill animals
  - HABs
  - Infectious disease
- Juveniles
  - Neonates/failure to thrive
  - Subadults

Pinnipeds

- **Juveniles/orphans**
- Entanglement
- Gunshot wounds
- Harrassment causing maternal abandonment
- Conspecific aggression
- HABs
- Storms

- Viral diseases
  - PDV
  - Influenza
  - Calicivirus (SMSD)
- Parasitic diseases
- Bacterial diseases
  - Leptospirosis
    - California sea lions

Northern elephant seal skin disease

- Unknown cause

Dead strandings

- Rehab & release has questionable value
- However, necropsy of dead animals has great value and should not be underestimated
- Necropsy may reveal information on natural history, reproductive status, anthropogenic hazards, diseases, toxins, ecology/ecosystem health,etc

Carcass evaluation

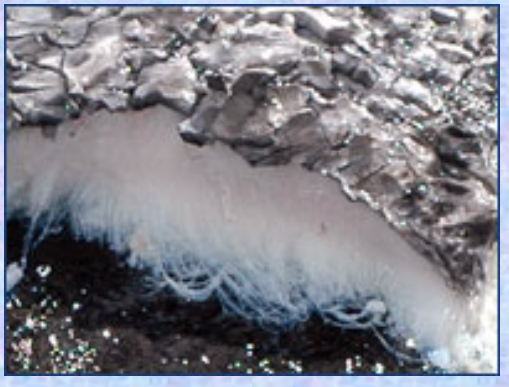
- Standardized code system
- Determines use of biological material
  - Code 1 – Live animal
  - Code 2 – Good condition (fresh)
  - Code 3 – Fair condition
  - Code 4 – Poor condition
  - Code 5 – Skeletal or mummified remains

External appearance

- Not a reliable indicator of condition
- Most cetaceans sink initially, then float days or weeks later
  - May appear intact, but are decomposed internally

Code 2

- Minimal drying of skin, eyes, mm
- No bloating
- Blubber is firm and white
- Muscles are firm and dark red
- Serum not hemolyzed
- Viscera intact
- Brain is firm & not discolored



Code 3

- Decomposed, but organs intact
- Tongue & penis protruded
- Blubber is blood-tinged & oily
- Muscles soft and poorly defined
- Blood hemolyzed
- Viscera soft & friable
- Brain soft, with dark reddish cast

Sperm Whale, Riis Park/Fort Tilden, NY
5 Jan 2003, Photo: Angus Wilson

Code 4

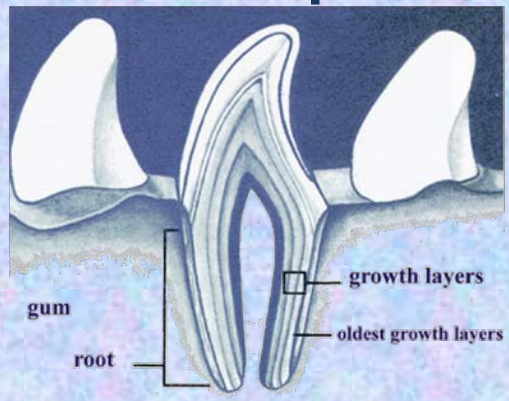
- Advanced decomposition
- Skin sloughing
- Characterisitic foul odor
- Blubber soft with gas & oil pockets
- Muscles liquified
- Blood thin and black
- Brain dark red, pudding consistency

Code 5

- Mummified or skeletal remains
- Dried skin may be present
- Other tissues dessicated

Internal exam

- Take samples for culture as you go
- Sample for histo, toxicology
- Take samples of all parasites
- Take samples of stomach contents
- Where indicated, take frozen samples
- Take tooth sample (species-dependent)



Live stranding

- Report it – marine mam. protected by numerous state & federal agencies
- Safety of animals & people is the primary concern
- Never attempt to push the animal back out in the water
  - Stranded animals are distressed
  - They will simply die or strand again
    - Exception: mass strandings

Effects of stranding

- Hyperthermia
- Dehydration
- Aspiration
- Pressure
- Trauma
- Psychological stress/disorientation

Hyperthermia

- Cetacean skin lacks sweat glands
  - Cannot lose heat effectively
- Blubber, countercurrent circulation all primed to keep animal warm
- No skin protection from sun
  - Sunburned skin is very painful

Dehydration

- Hx of anorexia is likely
  - Get water from food
- Lose water during respiration, from wounds
  - Exacerbated with tachypnea
- Sun, wind accelerate dehydration
- Animal may have been struggling in water for hours prior to beaching

Aspiration

- May occur prior to stranding
- May occur during careless wetting of animal
- Sand, other debris may be inhaled
- A very weak animal must be held upright in the water

Pressure

- Cetaceans designed for neutral buoyancy
- Organ dysfunction, muscle cramping
- Padding is critical

Traumatic injuries

- Skin is delicate
  - Easily damaged
  - Sun-burned (blisters)
- Animal may have stranded due to injuries, or may have incurred injuries during stranding
  - Struggling in surf, against rocks
- Wounds & sunburn cause additional fluid/electrolyte losses

Distress/Disorientation

- Vocalizations
  - May be associated with stress
  - Cessation may indicate depression
- Animal may be unable to right itself
- In practice, little can be done
  - Minimize noise/chaos
  - Minimize time out of water
  - Make decision to transport or euthanize

Response

- Complex situation
- Many people and agencies involved
- Important to identify who is in charge
- Best to have single experienced person to deal with the media
- Stressful situation for both animals and humans alike

The Basics

- Record everything!
- Photograph all identifying marks, lesions, scars

- Stay organized and focused
  - Take breaks when needed
  - Communicate with team
- Communicate with, and – where appropriate – involve the public

First concern

- Animal must be placed in a stable environment
  - Preferably in the water
  - Hold gently, keep blowhole above the water
  - If the animal cannot be moved to the water,
    - Dig holes for pectoral fins
    - Clean blowhole of debris
    - Cover with wet towels

Second concern

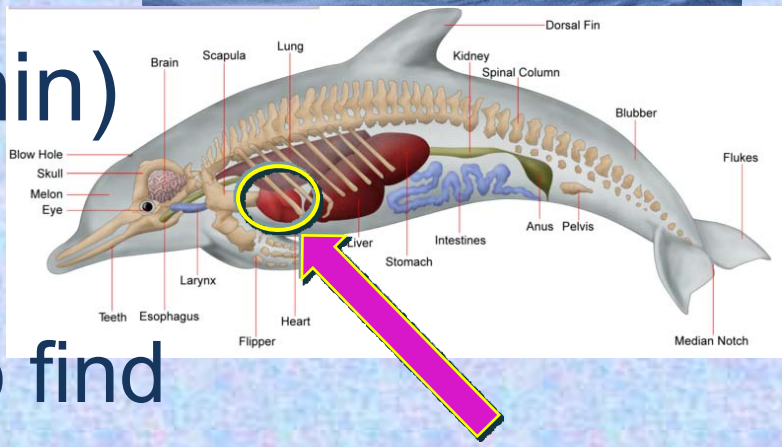
- People management
  - Marine mammals tend to attract a crowd of on-lookers
  - Most people want to help, but are untrained
  - Keep noise to a minimum
  - Send people for towels, buckets, supplies, etc.
    - Give them something to do
    - Safety is the priority

Procedure

- Identify species, sex, age class
- Morphometrics
  - Standard measurements
  - Weight
  - Blubber thickness
- Externally examine
  - Oral cavity, blowhole/nostrils
  - Eyes
  - Mammary glands, penis

Assessment

- Reflexes
  - Blowhole, palpebral
- Respiratory rate (1-3/min)
- Heart rate
  - Can be challenging to find
  - 30-70 bpm, sinus arrhythmia is normal
- Temperature (97.7-99.5°F)



Maintenance

- Keep the animal cool, wet, & protected from the sun
  - Water, zinc oxide are safe
- Assign someone to take and record respiration rates
- Support animal with equal number of people on each side
  - People should be calm and quiet
  - Change out people one at a time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Restraint

- Dolphins are incredibly strong
- Kneel or stand up against the body
  - Place your arm over the top of animal

- Avoid the “swing range”


ANIMAL CARE TEAM
Living Seas
AQUAPRO

Stretchers

- Transport is very stressful for animal
- Cetaceans require special stretchers
  - Must have holes for pec fins
    - Fins do not bend!
- Soft materials & padding are **essential**
  - Cetaceans are heavy
  - Body is not built to support weight!
    - Normally in the water


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