### Marine Mammal Necropsy Protocols







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## The "level A"

- Initial information
- REQUEST A
   NMFS ID!
- Filled out by "first responders"
- Initiates the question of human interaction
- Required to be submitted to NMFS / NOAA
- Location

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MARINE MAMMAL STRANDING REPORT - LEVEL A DATA

# Background, confidence, location, carcass code

MARINE MAMMAL STRANDING REPORT - LEVEL A DATA

FIELD #	NMES REGIONAL #	NATIONAL DATABASE#
	(NI	(NMFS USE) (NMFS USE)
COMMON NAME:	GE NUS:	SPECIES:
EXAMINER Name:		Affiliation:
Address:		Phone:
Stranding Agreement or Authority.		
CONFIDEN	CE CODE (Check ONE): Unconfirmed - Lo	w 🗖 Confirmed - Minimum 🗖 Confirmed - Medium 🗖 Confirmed High
INITIAL OBSERVATION	Same Information for Level A Examination	LEVEL A EXAMINATION Examined?
DATE: Year:Month:	Day	DATE: YearMonth:Day
First Observed: 🔲 Beach/Land/Ice 🛛	Floating 🗖 Swimming	First Examined: Beach/Land/Ice Floating Swimming
LOCATION: State:County:	City	LOCATION: State:CountyCity
Body of Water:		Body of Water:
Lat (DD):	<u>N</u>	Lat (DD):
Long (DD):	W	Long (DD):W
Actual Estimated		Actual Estimated
How Determined: (check ONE)		HowDetermined: (check ONE)
GPS Map Internet/Softw	are Other	_ GPS _Map _Internet/Software _Dther
	<b>IUN</b> (Check ONE)	CONDITION AT EXAMINATION (Check ONE)
1. Alive	4. Advanced Decomposition	1. Alive 4. Advanced Decomposition
2. Fresh Dead		2. Fresh Dead     5. Mummified/Skeletal
3. Moderate Decomposition	B. Condition Unknown	

## Carcass condition

- Autolytic (rotting) changes
  - Smell
  - Skin slough
  - Exposure of bones
  - Loss of detail and firmness of the organs
- Scavenger damage
- Maggots
- Classify the carcass (2-5)



NMFS 932-1905-01 / MA-009526

B. Carlson - beluga

# Carcass condition code helps determine what samples can be taken

Code	Definition	Gross Appearance	Specimen collection
2	Freshly dead "edible"	No bloating; minimal drying and wrinkling of epidermis; minimal wrinkling and change of eyes and mucous membranes; muscles firm; blubber firm and white or yellow; internal organs intact; liver still with physical integrity	All types of specimens should be collected
3	Moderate decomposition	Slight bloating with tongue and penis protruding; some skin sloughing and cracking; eyes sunken; blubber may be blood tinged; muscles soft; all internal organs including liver still have gross integrity but are soft and friable	Morphometrics, gross pathology, parasitology, genetics, life history, +/- histology on lesions.
4	Advanced decomposition	Very bloated; missing patches of epidermis and hair; internal organs show lack of integrity and are extremely friable; blubber with gas pockets and pooled oil	Morphometrics, gross path, parasitology, genetics, life history
5	Severe decomposition	Mummified; skeletal	Limited morphometrics, age, skeletal pathology, genetics

## Scavenger damage



#### NMFS 932-1905-01 / MA-009526

#### 932-1489-08

## True ante mortem changes

- Evidence of hemorrhage
- Inflammation
  - visible purulent material
  - Histologic
- Other tissue reaction nodules or thickenings indicating fibrosis / inflammation

## Code 2 – no scavenging; no slip; very little odor



## **Code 2:** SUPER fresh – would you eat it?



# Code 3: Some slip, smell, minor scavenging; internal organs intact





# Code 4 – skin sloughing; internal organs lose integrity



## Code 5 – Skeletal / mummified





## Code 5 – bones and maggots Can you figure out the cause of the UME?!!@!



## Code 5 mummified



# What happened then; Fresh or Frozen? PHOTOS

LIV	E ANIMAL INFORMATION	·	DEAD ANIMAL INFORMATION						
інп	IAL LIVE ANIMAL DISPOSITION	(Check one or more)	CARCASS STATUS (Check one or more)						
	1.Left at Site	5. Died at Site	1. Frozen for Later Examination/Necropsy Pending						
	2. Immediate Release at Site	6. Died During Transport	2.Left at Site 5. Landfill 8. Towed: LatLong						
	3. Relocated and Released	7. Euthanized	3.Buried     □     6.Incinerated     □     9.Sunk: LatLong						
	4. Disentangled	8. Transferred to Rehabilitation:	4. Rendered 7. Composted 10. Unknown/Other						
	∎a. Partially ∎b. Completely 9. Other	Date: Year:Month:Day Facility:	NECROPSED YES NO Limited Complete						
CON	IDITION/DETERMINATION (Chec	sk one ormore)							
	1. Sick	7. Location Hazardous	NECROPSED BY:						
	2. Injured	🗖 a. To animal	Date: Year:Month:Day:						
	3. Out of Habitat	🗖 b. To public							
	4. Deemed Releasable	8. Urknown/CBD							
	5. Abandoned/Orphaned	9. No Rehabilitation Options	Photo/Video Disposition:						
	6. Inaccessible	🗖 10. Other:							

## Photos!!!

Always! With an ID and scale)

## **Right angles**







### Start far away and work in for scale









- Start far away and work in for scale
- +/- Take one without a scale and ID for publications



## Basic animal info

#### MORPHOLOGICAL INFORMATION

SEX (Check ONE)	ESTIMATED AGE CLASS (Check ONE)								
🔲 1. Male	🗖 1. Adult 🛛 🗖 4. Pup/Calf								
🔲 2. Female	🗖 2. Subadutt 🛛 🗖 5. Unknown								
🔲 3. Unknown	■ 3. Yearling								
□Whole Animal	■Partial Animal								
Straight Length:	Crn 🗖 in								
■Actual ■Estimate	d 🗖 Not Measured								
Weight:	kg 🔲 lb								
■Actual ■Estimate	Actual Estimated Not Weighed								
SAMPLES COLLECT	<b>ED</b> (Check one or more)								
🗖 1. Histology 🔲 2	. Other Diagnostics 🛛 🗖 3. Life History								
🗖 4. Skeletal 🔲 5.	Other								
PARTS TRACKING	(Check one or more)								
🔲 1. Scientific Colle	ection 🛛 🔲 2. Educational Collection								
🔟 3. Other									

R AN A

NOAA Form 89-864; OMB Control No.0648-0178; Expiration Date

### Sex

#### Cetacean





#### Pinniped



Figure 3-8. Female pinniped.



## Age Class

#### Choices

- Adult
- Subadult
- Yearling
- Pup/Calf
- Unknown
- Generally Based on length



### Spotted seals (Phoca largha)

(from Quakenbush 2009)

### MEASUREMENTS: Straight length and Mass for level A



#### (Geraci and Lounsbury 2005 Marine Mammals Ashore)



# Human Interaction – Very important for management

- Topic of a whole Lab
- Systematic
- Thorough
- Conservative
- Legal Collection of evidence
- Whole section in the Examiners guide

OCCURRENCE DE TAILS   Restrand  GE #
(NMFS Use)
Group Event: YES NO
IfYes, Type:
Was the Marine Marmal Human Interaction Report completed? 🗖 YES 🔲 NO
Findings of Human Interaction: YES NO Could Not Be Determined (CBD)
If YES evidence of 1. Vessel Interaction  YES NO
2. Shot TYES NO CBD
3. Fishery Interaction 🗖 YES 🔲 NO 🗖 CBD
4. Other Human Interaction:
If YES, what was the likelihood that the human interaction contributed to the stranding event?
Gear/Hiltems Collected? 🔲 YES 🗖 NO Gear Disposition:
Other Findings Upon Level A: YES NO Could Not Be Determined (CBD)
If Yes, Choose one or more: 🔲 1. Illness 🔲 2. Injury 🔲 3. Pregnant 🔲 4.Other:
HowDetermined (Check one or more): 🗖 External Exam 🛛 🗖 Internal Exam 🗖 Necropsy
Other:

#### **Monofilament net**



#### Gunshot wounds



#### **Fishing gear**



#### **Packing bands**



## Ship strike

#### **Blunt trauma**

#### Lacerations



The question is whether the animal was alive when struck

#### V16-047 2016053 BP1601 May 29, 2016







#### Human Interaction procedures and forms

- Topic of a whole Lab
- Officially every necropsy
- Systematic
- Thorough
- Conservative
- Legal Collection of evidence

	Appendix C. Human In PROTOCOL FOR	ntera Ex <i>A</i> Exal	actio MIN m Ir	n Ev ING	valua MA mat	ation RINE	For M	rm a AMI in c	nd I MAL	instr S FC	ucti DR S	ons. SIGN: st ar	s oi	F <b>H</b>	UMA ate)	n In	NTEF	RACT	FION	
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21	Examiner:				_				R	econ	der:							_		
3	3 Date of exam:								С	ondit	tion	code	(at e	exan	n): 1	2	34	5	CBD	
4	4 Preservation: alive fresh frozen frozen/tha								B	odv (	cond	lition:	em	acia	ted	not	em	aciat	ed	CBD
5 1	5 Documentation: direct resh nozen nozen na							)	In	nade	dist	oositi	on:							
6	6 Integument : normal abnormal decomp								%	Ski	n mis	ssing	<	10%	10-	25%	5 25	-50%	6 >	50%
<ul> <li>7 Explanation of terms:</li> <li>YES = I have examined the area and found signs of human interaction</li> <li>NO = I have examined the area did not find signs of human interaction</li> <li>CBD = I have examined the area and could not determine whether there were signs of human interaction (i.e. the part was missing, degraded, or signs were ambiguous)</li> <li>NE =I did not examine the area</li> <li>NA = I this animal does't normally have that part (i.e. seals have no dorsal, dolphins have no rear flippers)</li> </ul>																				
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8	Head/appendages remove	ed (wi	th inst	umen	8								5		inag	o tan	011 (11	,		
q	Pelt removed (with instrument	a a	ur misu	umen	9			-			-							-		
10	Rody sliced (with instrument)							-			-		5	<				-		
11	Gear/debris present on animal							-			-		$\leq$	$\geq$				-		
12	Gear retained (some & contract info in Commonte)							-		5	~	$\sim$	$\sim$	$\rightarrow$	<u> </u>	>	~	_		
13											$\rightarrow$		$\succ$	~	_					
14	Natural markings (case tests plan unusual simulation)											$\leq$	$\geq$				$\neg$			
15	5 Othor Hillosions, (ast supplied associated with					_			-		$\leq$	$\geq$				-				
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18	mandible																			
19	head																			
20	R front appendage																			
21	R body																			
22	dorsum/dorsal fin																			
23	L front appendage																			
24	L Body																			
25	ventrum																			
26	peduncle																			
27	R rear appendage																			
28	L rear appendage																			
29	flukes/tail																			
30																				



Mapped by NOAA Fisheries Alaska Region, Protected Resources Division (K. Savage), 2015

### Don't forget the Level A back side!

TAG DATA	·	ID#	Color	Туре	Placement*	Applied	Present	Removed	
TagsWere: Present at Time of Stranding (Pre-existing):	YES NO				(Circle ONE) DDFLR LFLRRFRR				
Applied during Stranding Response/Release: Applied during Rehabilitation/Release: Absent but Suspect Prior Tag:	YES NO				D DF L R LF LR RF RR			۵	
					D DF L R LF LR RF RR				
	* D= Do	rsal; DF= Do	orsal Fin; L= I	.e ft Lateral B	lody R= Right Lateral Body L	F= Left Front; LR=	Left Rear; RF= R	light Front; RR= Rig	ht Rear
ADDITIONAL IDENTIFIER:			(Ifanir	n al is restra	anded, please indicate a	ny previous f	ield numbers	s here)	
ADDITIONAL REMARKS:									

## Intermission

#### NOAA MMHSRP PERMIT - 18786

## Goals of necropsies

- Determine cause of death
- Management tool
  - assessment
  - Human interaction issues
- Look for Disease
  - Direct mortality/morbidity
  - Reduced productivity
  - Zoonoses (sentinels)
  - Emerging disease (sentinels)
  - Baselines



- Samples for various studies life history, feeding ecology, toxicants, biotoxins
- Relate these factors to "health"



## HISTORY

- Describe the location of the mortality event
   PHOTOS
  - Lat;Longs are NEEDED
  - Decimal degrees
- Unusual environmental factors
- Estimate disease onset (fresh vs rotten)
- Any UME's ongoing?





## Assessment of Body condition

Figure 3-5. Robust pinniped.





Figure 3-6. Emaciated pinniped.



#### From Pugliares 2007, WHOI Necropsy manual

## External assessment of Body condition

Figure 4-5. Robust cetacean



#### Figure 4-6. Emaciated cetacean



#### Pugliares 2007 WHOI Necropsy manual

## Body condition estimate

J. Richmond – Steller sea lion

## **External examination**

- Sex
- Age
- Palpate for fractures, other trauma
- Anything different?

### TAKE A PHOTO !!

#### **USFWS** -Verena Gill

# Take the basic samples

- Aging Teeth or skull
- Genetics Skin
  - DMSO
  - ETOH
  - Or Frozen
- Contaminants Blubber
  - In Foil or Teflon
- HABs Stomach contents and feces
- Prey ID –Stomach

#### Figure 3-13. Removal of lower left jaw.



Figure 4-18. Removal of lower left teeth.



From Pugliares 2007, WHOI Necropsy manual

## Initial moves

- Blubber removal
- Varies by species
- Open up cavities

Figure 4-19. Animal in lateral recumbency with numerous transverse, full blubber thickness incisions.



From Pugliares 2007, WHOI Necropsy manual



### Systematic examination of internal organ systems



Do the magic combo TEST: What is that?



From Pugliares 2007, WHOI Necropsy manual





Some samples are harder than others!



What do I do if I see something weird?

 Do the magic combo: FACTS (Species, sex, age) PHOTON FREEZE FIX (don't freeze)



NSB 17350-00



## Histopathology Formalin:Tissue at least 10:1 -(10% NBF)



## Histopathology

- Formalin:Tissue at least 10:1

   (10% NBF)
- 0.5 1.0 cm thick
- Major organs and lesions
- Protect from freezing



Tissue

## Above and beyond: Museum of the North (University of AK museum)

- At over 95,000 mammal specimens
- UAM Collection is among the largest in the Western Hemisphere
- Houses a world-class collection of marine mammals.
- Alaska Frozen Tissue Collection (AFTC)
  - samples from over 49,950 animals
  - the largest tissue collection specializing in northern regions
  - among the largest such collections worldwide.
- Samples since the 1950s.

# Sampling – Frozen tissues, whiskers and bones.





Please note down the bar code number for each tissue on the form

### **Excellent reference!**

WHOI-2007-06

Woods Hole Oceanographic Institution





Marine Mammal Necropsy: An introductory guide for stranding responders and field biologists

> by Katie R. Pugliares<sup>1</sup> Andrea Bogomolni<sup>2</sup> Kathleen M. Touhey<sup>1</sup> Sarah M. Herzig<sup>1</sup> Charles T. Harry<sup>1</sup> Michael J. Moore<sup>2</sup>

<sup>1</sup>The Cape Cod Stranding Network, Inc P.O. Box 287 Buzzard's Bay, MA 02532 508-743-9805 <sup>2</sup>Woods Hole Oceanographic Institution Biology Department Woods Hole, MA 02543 508-289-3228

September 2007

Technical Report

Funding was provided by the National Oceanic and Atmospheric Administration under Cooperative Grant No. NAD5NMF4391165.

Approved for public release; distribution unlimited

Pugliares, K.R., et al 2007. Marine mammal necropsy: an introductory guide for stranding responders and field biologists. Woods Hole Oceanog. Inst. Tech. Report. WHOI-2007-06

# FORMS and REFERENCES: <a href="https://sites.google.com/site/akvetpath/">https://sites.google.com/site/akvetpath/</a>



NMFS Stranding Hotline: (877) 925-7773 or (877) 9-AKR-PRD

Alaska SeaLife Center Stranding Hotline: (888) 774-7325

#### Questions?

- AVPS
  - Kathy Burek (907) 242-2566 (C), Avps.kbh@gmail.com
  - Natalie Rouse (402) 499-9515 (C) avps.natalie.rouse@gmail.com
- NOAA -
  - Mandy Keough (907) 459-7367 (W) (907) 209-0637 (C)
  - Barbara (907) 271-3448 (W), (907) 331-8528 (C), barbara.mahoney@noaa.gov
  - Kate Savage (907) 957-2230 (C), kate.savage@noaa.gov
- ASLC
  - Stranding Hotline: (888) 774-7325, rehab@alaskasealife.org
  - Carrie Goertz (907) 224-6326 (W), (907) 362-2267(C), carrie\_goertz@alaskasealife.org