

Pre-Take Reduction Team Meeting
Nov 19-20, 2009 - Honolulu, Hawaii

**Stock Assessment Process -
Assessing human-caused
mortalities and serious injuries**



Presented by
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Assessing human-caused mortalities and serious injuries

MMPA, Sec. 117. (a) (3):

Each draft stock assessment, based on the best scientific information available, shall estimate the **annual human-caused mortality and serious injury** of the stock by source...

Human-caused mortality & injury sources:

Incidental fishery takes

Ship strikes

Power plants

Illegal shooting

Research mortalities

Naval exercises

Other...



Sources of information

- Self-reports by fishermen (required by MMPA)
- Strandings (rarely observed, biased)
- At-sea reports (ship strikes, sightings)
- On-board observer programs:
 - ✓ Document marine mammal takes on sampled trips
 - ✓ Trained in species identification
 - ✓ Can collect biological samples
 - ✓ Record mortalities / injuries
 - ✓ Forms designed to collect data to distinguish serious vs. not serious injuries.
 - ✓ Collect additional data on the nature of marine mammal interactions with gear

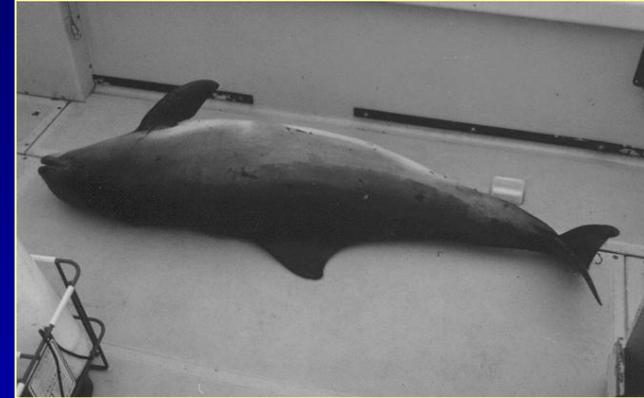


Photo: NOAA-PIRO Observer Program

Observer data and take estimation for Hawaii Longline Fisheries

Shallow-set:

- 100% observer coverage
- No estimation required!

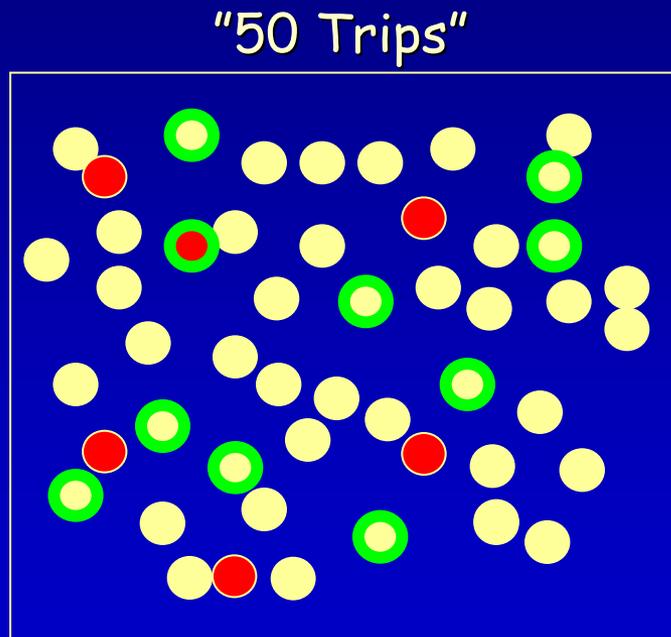
Deep-set:

- $\geq 20\%$ observer coverage (varies seasonally)
- Estimation is done by season
- Analysis extrapolates from observed to estimate total takes

→ 20% coverage provides good estimates of total marine mammal takes

Estimating annual takes of marine mammals in fisheries

- Based on a sample of all fishing trips, extrapolated to rest of fleet
- Simplified conceptual overview:



10 Observed (20%):

1 with a take

9 with no take

→ 1 take per 10 trips
(rate = 0.1)

For all 50 trips:

$50 * 0.1 = 5$ estimated takes
(observed and unobserved)

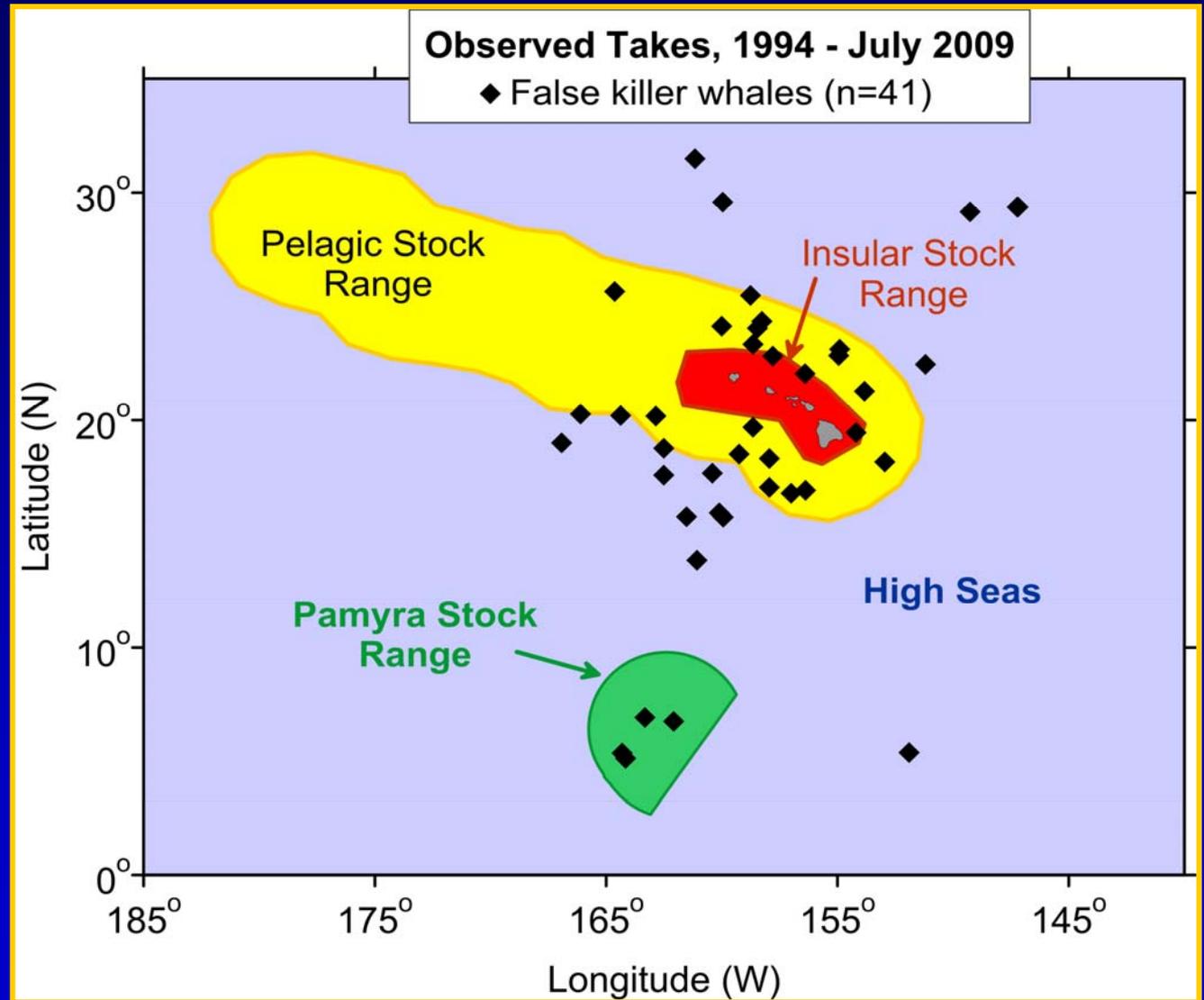
Assumptions and additional estimation steps

- Simple method assumes sampled trips are representative of unsampled trips
- Actual calculations are more complex to adjust for potential uneven sampling, season, area, and numbers of marine mammals killed or seriously injured vs. not seriously injured...
- Need to...
 - ...Differentiate species and stocks
 - ...Differentiate serious from non-serious injuries

Attributing takes by stock

Attribution methods

- *Geographic*
- *Genetics*
- *Seasonal (e.g. Atlantic bottlenose dolphin)*
- *Prorating*
- *Individual identification*



Serious Injury Determination Takes = Mortalities and Serious Injuries

Serious Injury = "Any injury that will likely result in mortality" (NMFS, 50 CFR 229.2)

- April 1997: Serious Injury Workshop (*Angliss and DeMaster 1998, NOAA Tech Memo NMFS-OPR-13*)
- September 2007: Serious Injury Technical Workshop (*Andersen et al. 2008, NOAA Tech Memo NMFS-OPR-39*)

Differentiating Serious and Non-Serious Injury of Marine Mammals:

Report of the Serious Injury Technical Workshop
10-13 September 2007, Seattle, Washington

Workshop Steering Committee:
Melissa S. Andersen (Chair)
Karin A. Forney
Tim V. N. Cole
Tom Eagle
Robyn Angliss
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United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

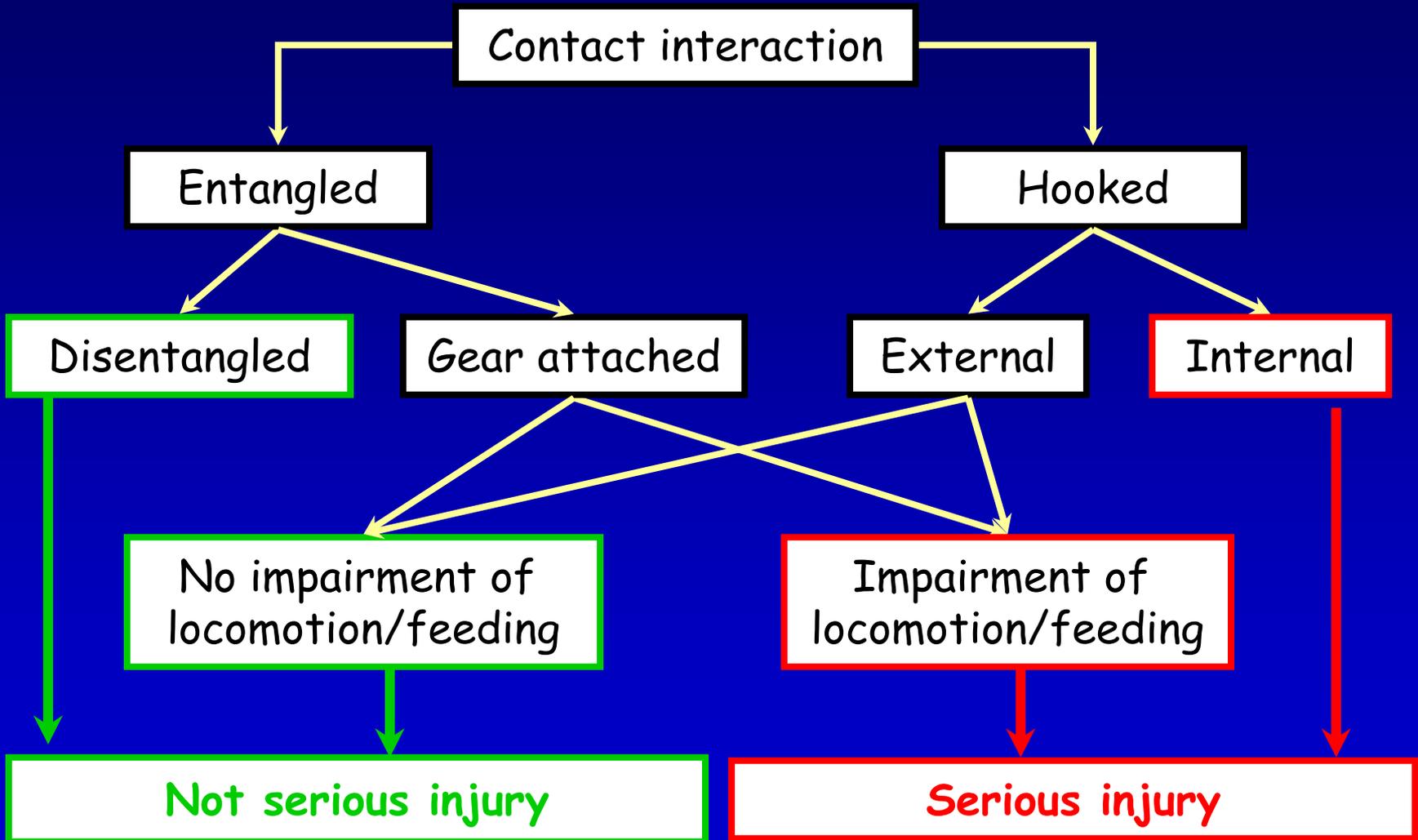
NOAA Technical Memorandum NMFS-OPR-39
September 2008

Serious Injury Determination Guidelines

1997 Workshop (Ancliss and DeMaster 1998)

- Marine mammal, fishery, and veterinary experts
- Serious injuries: impair feeding or locomotion
- Key recommendations relevant to longline fishery:
 - Serious:** Hooked internally (mouth, ingested)
Released with substantial gear attached
Swimming abnormally
 - Not serious:** Hooked externally (body, fluke)
Released with no or minimal gear

Serious injury determination



Updated Serious Injury Determination Guidelines

2007 Serious Injury Technical Workshop Report
(Andersen et al. 2008)

- Broadly reaffirmed previous determinations
- Clarified 'Substantial gear' = gear wrapped or with potential to wrap around appendages, beak, or head
- Should consider length of 'confinement' (capture myopathy = severe muscle tissue damage)
- Developed table with injury types to guide process

Serious Injury Determination - Examples



Photos: NOAA-PIRO Observer Program

False killer whale hooked in fluke, line cut with only 1 ft of line and hook attached.

Not in head area, cannot wrap around appendages or head, swimming actively

Therefore, animal is not seriously injured.



False killer whale hooked in mouth

→ Mouth/head hookings are considered serious for dolphins and small whales because this impairs feeding.

Therefore, animal is seriously injured.

Questions?