Hawaiian Islands Cetacean Ecosystem Assessment Survey (HICEAS) II

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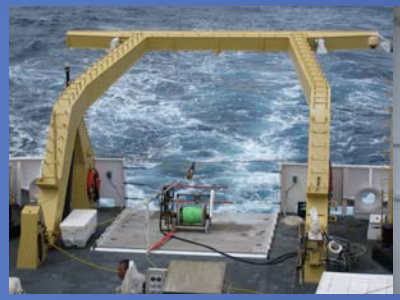
False killer whale TRT meeting #3: June 17, 2010, Turtle Bay HI

HICEAS II - 2010

- Two ship survey- collaborative effort with SWFSC (Chief Sci- Jay Barlow & Erin Oleson)

  ~120 days on R/V *McArthur II,* ~ 55 days on R/V *Sette*
- False killer whale focus
- Multi-faceted survey:
  - Visual observers, Acousticians, Oceanographers, Birders
  - Photo-ID, biopsy, (satellite tagging)
- Can combine sightings / detections with 2002 survey



Track lines for HICEAS II

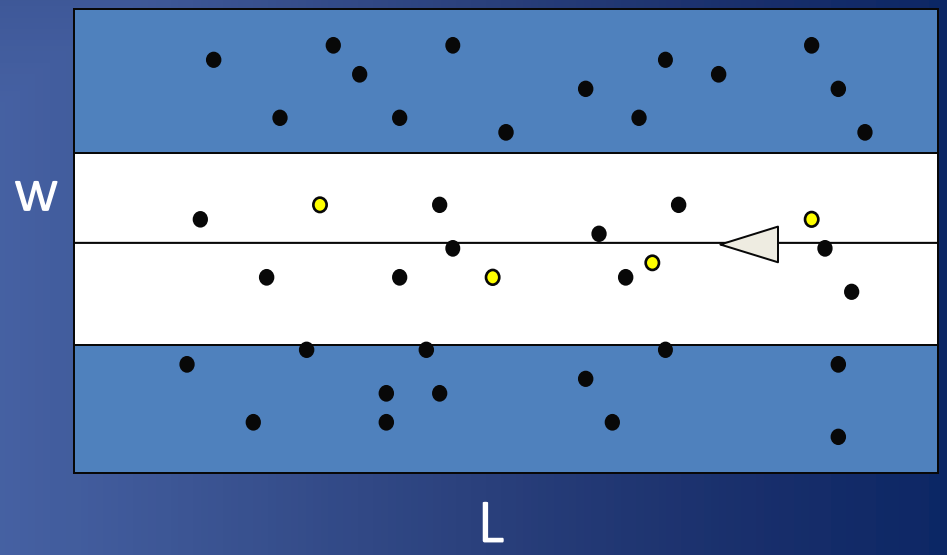
Tracklines 2002 + 2010

How will we improve the precision of the abundance estimates?

- The line-transect equation:

$$D = \frac{n * s}{2w * L * g(0)}$$

n = # of sightings
s = group size
2w = strip width (both sides of the ship)
L = length of transect line
g(0) = trackline detection probability



How will we improve the precision of the abundance estimates?

$$D = \frac{n * s}{2w * L * g(0)}$$

Constrained parameters-

2w - strip width – dependent on sighting conditions

- multiple covariate approach already uses all FKW sightings to estimate w
- acoustics can detect farther from trackline = increase in 2w

L – transect length – measured value, no uncertainty

- can be increased with additional ship time & funding

How will we improve the precision of the abundance estimates?

$$D = \frac{n * s}{2w * L * g(0)}$$

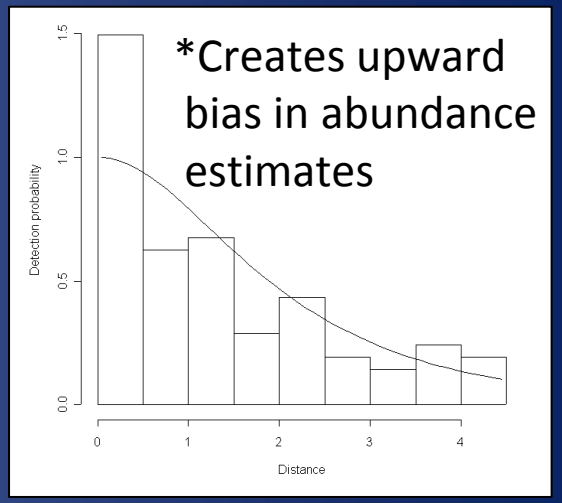
- Improve school size estimates (s):
  - Before turning the ship, acoustic team determines spread and number of sub-groups*
  - All observers called to flying bridge for 60 minute count (observers provide independent estimates)*
    - Increased abundance estimate for sperm whales by factor of 2.
  - Small boat launched for photographs (weather permitting)

* Also results in greater accuracy in abundance estimates

How will we improve the precision of the abundance estimates?

$$D = \frac{n * s}{2w * L * g(0)}$$

- Improve trackline detection probability (g(0)):
  - Compare acoustic detection and visual sighting rates
  - Assess vessel attraction
    - Independent rear-facing observer
    - Acoustic assessment of distribution relative to the vessel

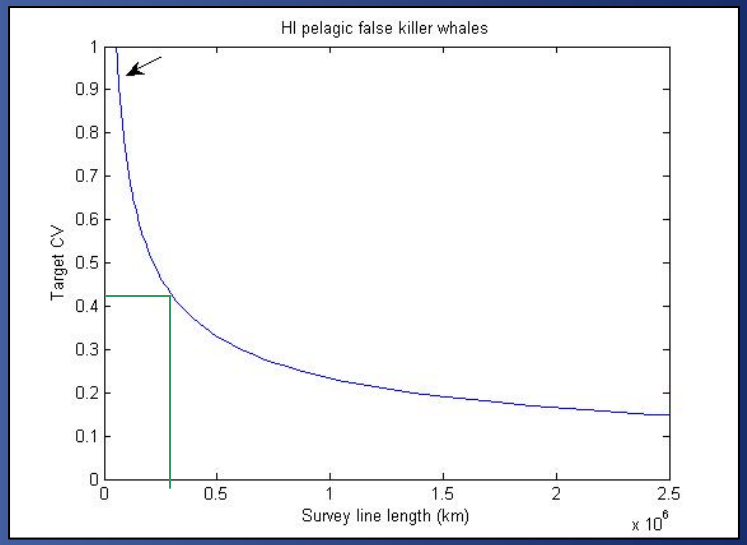


How will we improve the precision of the abundance estimates?

$$D = \frac{n * s}{2w * L * g(0)}$$

- Find more groups (n):
  - Integrated acoustic observations – acoustic detections get same treatment as visual observations (turn for group size, launch small boat, etc.)
    - More detections

      = better precision
  - More ship time



Acoustic Contributions

- Combination of visual and acoustic detections can provide an alternative estimate of abundance
  - Acoustic truncation distance larger than visual
    - Larger search area = lower CV
- Provides estimate of groups missed by visual survey alone
  - Better assessment of 2w and g(0)
- Movement of animals relative to the ship
  - Is there vessel attraction?

Summary

- We are making a number of changes in how animals are detected
- Some changes (e.g. 60-minute count) may increase abundance estimates, but not reduce CV
- Other changes (e.g. acoustic detection) may decrease CV without changing abundance

Other benefits

- Build photographic catalog of pelagic FKWs for mark-recapture estimation
- Collection of additional genetic samples to assess population structure

Questions?