

Humpback whale predation on Pacific herring in southern Lynn Canal: Testing a top-down hypothesis.

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A pair of humpbacks sound in front of the NMFS facility at Lena Point, being close to foraging whales permits winter fieldwork in small boats.

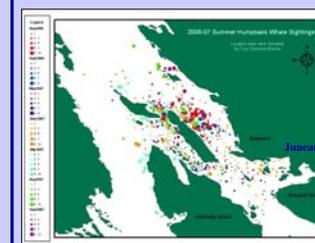


Unique markings on the flukes allow individuals to be identified.

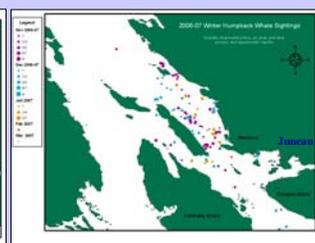
During the fall and winter months herring form large, dense schools; a predictable, energy rich, food resource for humpback whales.

WHY?

- Herring stocks in Lynn Canal have failed to recover despite the closing of commercial fisheries in 1982.
- The stock is currently being considered for listing under The Endangered Species Act.
- Are humpback whales inhibiting herring recovery?



Summer feeding areas were localized



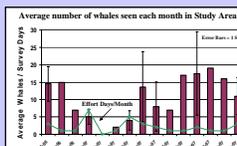
Winter locations correspond to deep water aggregations of herring



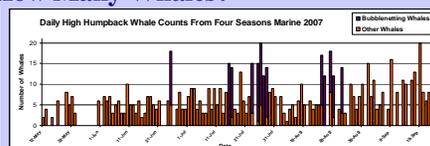
Study Area

Humpback whales are present in the study area through out the year.

How Many Whales?



Average number of whales seen each month in Study Area



Daily High Humpback Whale Counts From Four Seasons Marine 2007

Boat-based and aerial surveys were used to estimate whale number.

Commercial whale watching operators provided daily counts of whales (bubblenetting whales are feeding on herring).

Whale abundance estimates will be refined using mark-recapture methods

We have completed the first of two field seasons. Winter of 2007-08 work is in progress.

Quantified estimates of whale abundance will be combined in an age structured population model to assess the impact of whale predation on herring.

These observations will be compared to similar observations of humpback whale abundance and predation on herring in Prince William Sound where herring populations are also struggling, and Sitka Sound where herring populations are robust.

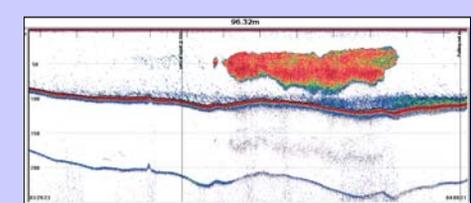
How Many Herring?



Trawl surveys "ground truth" acoustic targets



Age weight and length data were collected from herring



Herring biomass was estimated using hydroacoustics.

How do we know what whales eat?



Humpback whales surface feeding on krill, behavior may indicate prey type.



Lunging through a herring school.

Direct observations



Herring scales collected near a feeding humpback whale

Prey and scat remains



SIMRAD towfish (38kHz/120kHz transducer)

Infer from hydro-acoustics



Looking for humpback whales in Lynn Canal during a January snow squall

A minimum 109 individual whales have been identified

Herring in Lynn Canal are eaten by whales throughout the year

Euphausiids were the second most common prey item observed

Lynn Canal herring also prey on Euphausiids

