Spatial and temporal distribution of Cook Inlet beluga whales (*Delphinapterus leucas*) in the Little Susitna River Delta

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BACKGROUND

Beluga whale (*Delphinapterus leucas*) summer habitat features: near shore estuarine environments

Cook Inlet belugas recently designated an endangered species display similar patterns of seasonal use in the terminal branches of Upper Cook Inlet as their summer habitat of choice.

The Little Susitna River Delta is thought to be an important summer foraging, mating, and calving habitat area for Cook Inlet belugas.

SITE MAP

PURPOSE

**Alaska SeaLife Center**
Cook Inlet Beluga Remote Monitoring

✧ Pilot project
✧ Efficacy of video monitoring for beluga whales in the Little Susitna River Delta.
✧ Understanding the habitat features driving usage patterns by beluga whales
✧ Conservation of a steadily declining species.

MATERIALS AND METHODS

✧ Two cameras mounted to a 9-meter steel tower near the mouth of the Little Susitna River, Upper Cook Inlet, Alaska.

✧ Approximately 1.5 river miles (2.4 km) from the confluence of the Little Susitna River and the waters of Cook Inlet, at mean low tide.

✧ The signal was transmitted to an office in the ConocoPhillips building Remotely operated camera technology (SeeMore Wildlife Systems, Homer, AK) allowed an office-based observer to remotely manipulate the cameras in real-time via a microwave link.

✧ Scans of the study area were conducted every 20 minutes.

✧ When belugas were present, observers noted time, group location, size, composition, and behaviors, and used paper data sheets to record data.

✧ Group location was documented using a grid system consisting of five grids (A, B, C, D, E) covering all portions of the study area visible through the camera.

✧ Grid A consisted of an array of 500m x 500m cells. Grids B, C, D, and E consisted of arrays of 100m x 100m cells.

✧ Total sightings for each grid cell were imported into ArcGIS ArcInfo 10.0 (ESRI, Redlands, CA).

SPATIAL DISTRIBUTION

TEMPORAL DISTRIBUTION

Number of Groups
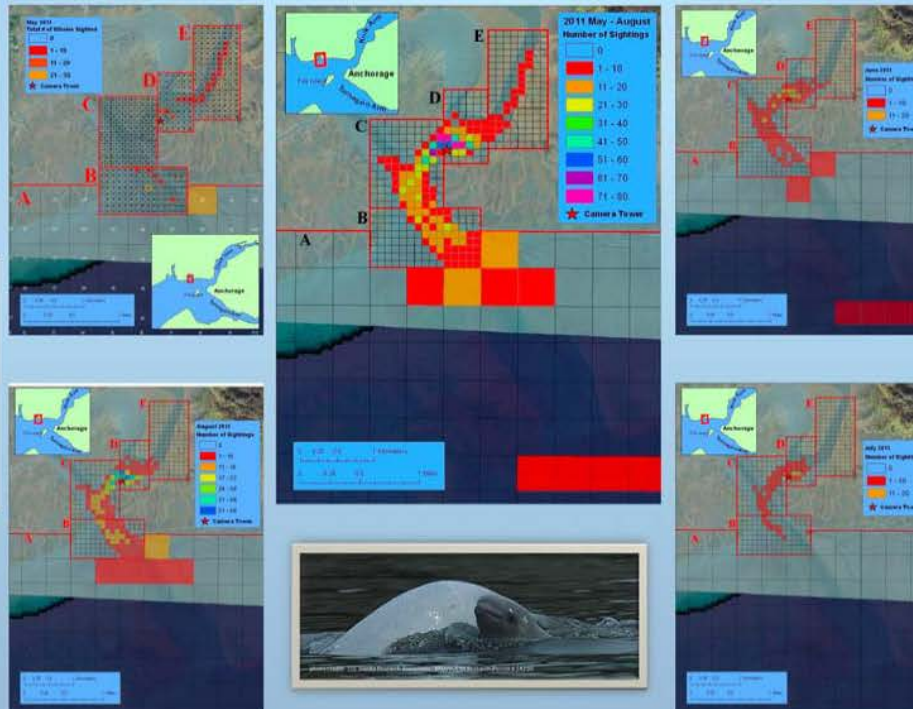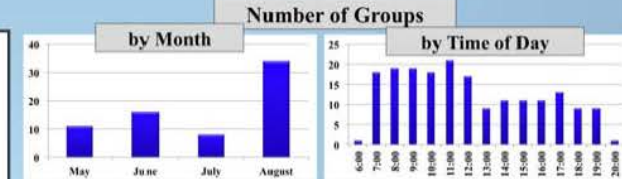
DISCUSSION

Spatial Distribution
✧ Belugas were seen most often, and in the greatest numbers, in grids B, C, and D.
✧ Belugas may have been present more frequently than recorded in grid A but due to distance and environmental conditions visibility in that area of the study was often poorer than other grids and whales that could have been present may not have been detected.
✧ Groups of belugas were observed spending longer periods of time near shore than mid-river.
✧ Belugas were seen up close near the shore in grids C and D, around a river bend.
✧ Because of the hydrodynamics of this location fish may become disoriented and/or concentrated, making them easier for belugas to capture compared to other locations in the study area.
✧ The greatest numbers of calves were observed in Grids C and D, however these grids were also the areas closest to the camera.
✧ If calves were present in grids A, B, and E they may not have been visible through the camera because of greater sighting distance and the resulting diminished image quality.

Temporal Distribution
✧ The frequency and number of beluga whales increased drastically in August (up to daily) as did the number of groups containing calves.
✧ Belugas are likely taking advantage of strong salmon runs in the Little Susitna River system throughout the season.
✧ Belugas may be using the sheltered study site as a nursery and social area later in the season explaining the extended sighting durations.

Project Design
✧ Success in establishing the capabilities of remote video cameras as well as assessing the frequency of occurrence, relative abundance, and surface behavior of beluga whales in the Little Susitna River.
✧ A wealth of benefits from video monitoring:
  ✧ Determining whether belugas were present at night during the late daylight hours of mid-summer.
  ✧ Capture extreme close-ups of individual whales, including newborn calves, and rare behaviors with absolutely no physical disturbance.
✧ The ability to review archived video for data collection and validation purposes resulted in a more accurate dataset than could be captured in real-time.

CONCLUSIONS

✧ Remote video monitoring is an important piece of the beluga monitoring puzzle in Cook Inlet, Alaska.
✧ Video systems have the capability to capture movement patterns and behavioral data in remote, secluded locations.
✧ Important for creating a comprehensive understanding of the relationship between endangered Cook Inlet belugas and their habitat.