

Satellite tracking of Western Arctic bowhead whales

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The western Arctic stock of bowhead whales (*Balaena mysticetus*) has been the focus of considerable research because: 1) they are critical to the nutritional and cultural health of Native Alaskans, 2) they are likely significant zooplankton grazers in the marine ecosystem of the Bering, Chukchi and Beaufort seas, and 3) they are vulnerable to possible effects from oil and gas exploration, development, and production in their summer range. Although, general movements are known from aerial surveys and from the timing of whaling in coastal villages, specific movements regarding migration relative to bathymetry and ice cover are less well known. The locations of specific feeding areas and bowhead behavior associated with human activities are not well understood. Working with other researchers and Native subsistence whalers, we plan to attach satellite transmitters to bowhead whales over the next four years. We deployed two transmitters in 2006 and two in 2007. We tracked a 45-foot (13.7 m) male bowhead whale over 2,500 km, from Point Barrow, Alaska, to Amundsen Gulf, Canada, and then to Chukotka, Russia. During the spring migration, between Point Barrow and Amundsen Gulf, the whale passed through seas with 90 – 100% sea ice cover, classified using Synthetic Aperture Radar (SAR) imagery. Using raw Argos location data and Bayesian state-space modeling, we interpolated whale locations and classified movements consistent with either migration (high speed and small turning angles), foraging (low speed and large turning angles), and a mixture of migration and foraging (low speed and small turning angles). The data indicate that this whale was probably feeding in Amundsen Gulf, along the coast of Chukotka, and also briefly near Point Barrow. The last known location of this whale was along the northeastern Chukotka Peninsula in November.

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