

Offshore Development: Biological Impacts

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Marine Mammal Distribution in Relation to Ice Conditions in the Bering, Chukchi, and Beaufort Seas

Studies of marine mammal distributions in relation to sea ice conditions are directed toward an understanding of (1) the habitat requirements of ice associated marine mammals; (2) the dynamic processes operating to produce those habitats; and (3) the spatial and temporal distribution of critical marine mammal habitats, such as wintering and breeding areas and migration routes, in relation to proposed oil lease areas. During winter and spring, seasonal pack ice covers all of the Beaufort and Chukchi seas and the northern and eastern parts of the Bering Sea north of about 56°N latitude. Prevailing winds, sea surface currents, temperature regimes, and land masses interact to produce a mosaic of broadly predictable, annually recurring ice features that are classifiable in terms of marine mammal habitats as ice front, land fast ice, drifting ice, recurrent polynyas, shear zones, zones of convergence and divergence, and persistent rafted ice remnants. The ice associated marine mammals of this vast region include the polar bear; walrus; ringed, bearded, ribbon, and spotted seals; and bowhead and belukha whales; each of which exhibits by its non-random distribution some affinities for particular kinds of ice conditions that occur in areas suitable for feeding. Progressive and retrogressive changes in the pack during autumn and spring also result in broadly predictable migrations of these animals, which are either obliged to move because of unfavorable ice conditions, or are allowed to move by the opening of suitable routes for their passage.

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