

DISTRIBUTION AND STRUCTURE OF DENS OF FEMALE POLAR BEARS IN WRANGEL ISLAND

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Abstract: During the period 1971-76, the number of dens of female polar bears (*Ursus maritimus*) in the Drem-Head Mountains (25 km² on the northwest side of Wrangel Island) underwent radical changes, ranging from a maximum of 63 dens noted in 1975 to a minimum of 17 dens in 1976. The number of dens was not directly related to spring snow depth.

The topography of the snow cover is very specific each year, depending on the direction of prevailing winds, slope exposure, absolute and relative elevation, and steepness. This results in uneven distribution of dens. More than half of the dens were found at middle elevations (101-300 m); snow depth here (average 137 cm) was 1.5 times less than at lower elevations and 1.35 times greater than at higher elevations. It is possible that females avoid areas of both too deep and too shallow snow cover.

Slopes with terraces which are not relatively high (up to 50 m) and with average steepness of 10-30° are especially favorable for the accumulation of snow, and it is here where most dens are found.

While bears are in their dens, changes in wind direction cause redistribution of snow, resulting in many dens becoming unsuitable (half-opened dens and dens with thin roofs). Females often leave such dens and dig temporary dens or occasionally reoccupy deserted ones. The proportion of temporary dens is higher in years with little snow.

Many dens show signs of the digging activity of the female; this is very conspicuous in dens with several chambers. The digging activity of the female brings about changes in the thermal and gas regimes in the den. If the female does not dig out a new chamber upward but digs it along or down the slope, the "igloo" principle — that the chamber of the den should be located higher than the entrance hole for preservation of heat in the den — may be violated. In dens located in areas with little snow where the snow cover upslope becomes thinner, the igloo principle may be easily violated.

Of 131 dens examined, 85 (65 percent) were maternal, 19 (15 percent) were temporary, and 27 (20 percent) were of unknown character. The relative proportions of maternal and temporary dens enables us to more precisely define the number of breeding females in the population.
