

## **Polar Bear Maternal Den Distribution in Northern Alaska**

**This report has been extracted from the USGS Biological Resource Division Alaska Biological Science Center Polar Bear Research Database May 5, 2003**

This report describes the distribution of polar bear maternal dens discovered by radio telemetry between spring 1982 and spring 2003. In most years during this period, a sample of pregnant female polar bears was fitted with radio transmitting collars. In any year, the number of pregnant bears collared was a small percentage of those available in the population. Therefore, these data do not represent total numbers of dens that occur in the Alaska region. We assume that denning habits of collared bears represent the habits of bears that are not collared. The majority of radio deployments occurred on the sea ice between the eastern edge of the 1002 area (141° W) and the eastern edge of the Colville River Delta (150° 30' W). The location of radio collar applications has not been found to bias the distribution of radio telemetry observed dens (Amstrup and Gardner 1994). Hence, although these data do not represent total numbers of dens, they do represent the spatial distribution of dens within the central Southern Beaufort Sea (SBS).

For this report, we define maternal dens as those created by solitary female polar bears in autumn or early winter and occupied at least until 1 January.

Dens in the database are distributed from St. Lawrence Island in the south west (63° 22'N 171° 45' E) to Wrangell Island in the north west (70° 59'N 178° 13'E) to Prince Patrick Island in the north east (77° 02'N 119° 08'N) to Queen Victoria Island in the south east (69° 28'N 116° 35'W). For purposes of examining the distribution of dens in northern Alaska and the lands near the Arctic National Wildlife Refuge, this report uses a primary study area defined by the longitudinal bounds of 167° W to 137° W. This roughly corresponds to Point Hope, Alaska to the western edge of the McKenzie River Delta in the Yukon Territory (see attached map).

**Between the spring of 1982 and the spring of 2003, 223 maternal dens were discovered by telemetry, of which 186 were in the primary study area.**

Polar bear dens occur on land, pack ice and grounded fast ice. Because grounded fast ice is near shore and because industrial activities use the fast ice for transit corridors and exploration, this report considers land and grounded fast ice dens together when considering the distribution of dens on a specified land unit.

All land and fast ice dens in this report were visited by researchers. However, logistic constraints and safety considerations prevented research observations of all pack ice denning radio collared bears. Prior to 1992, Polar Bear Project biologists flew long missions out across the pack ice to identify denning events by radio tagged bears. Remote sensing is able to recognize dens without the biases imposed by logistics and safety considerations of standard search methods.

**Of the 110 discovered by remote sensing between 167° W and 137° W 56 (50.9%) were on pack ice; the remaining 49.1% were on land or fast ice.**

**Of the 96 dens discovered by telemetry between 167° W and 137° W on land or fast ice, 33 (34%) were in the Arctic National Wildlife Refuge and 25 (26%) were in the 1002 Area.**

To examine temporal changes in polar bear den distribution in the central SBS, this report considers two periods: the spring of 1982 through 1991 and the spring of 1992 and later. The tables below tabulate den distribution by these two periods.

Please contact the Alaska Biological Science Center's Polar Bear Project leader, Steve Amstrup, to clarify or interpret the results of this report. If you use this report for public information, please attribute the information to the USGS Alaska Biological Science Center Polar Bear Research Database and indicated the date of this report. This report will be updated each year as more polar bear dens are discovered. Data presented here are currently being analyzed for presentation in refereed scientific publications. They must be considered preliminary and part of research in progress. They are provided only for public information and are not to be published or in any way presented as if they were a final research product.

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**Dens in the primary study area (167° W to 137° W) that were discovered by Argos satellite telemetry**

	Substrate				
	Pack ice	Fast ice	Land	(Land +	Total
<b>1991 and earlier</b>	29	3	17	20	49
percent	59%	6%	35%	41%	
<b>1992 and later</b>	27	6	28	34	61
percent	44%	10%	46%	56%	
<b>Grand Total</b>	56	9	45	54	110
percent	51%	8%	41%	49%	

**Dens in the primary study area (167° W to 137° W) that were discovered by telemetry**

	Substrate				
	Pack ice	Fast ice	Land	(Land +	Total
<b>1991 and earlier</b>	61	7	30	37	98
percent	62%	7%	31%	38%	
<b>1992 and later</b>	29	8	51	59	88
percent	33%	9%	58%	67%	
<b>Grand Total</b>	90	15	81	96	186
percent	48%	8%	44%	52%	

**Telemetry dens on the Arctic NWR land or adjacent fast ice**

Land and Fast Ice Dens			Arctic NWR Dens	Substrate		
				Fast	Land	Total
Percentage of land and fast ice telemetry dens in the primary study area (167° W to 137° ) that fall within the Arctic NWR			<b>1991 and earlier</b>	1	16	<b>17</b>
			Percent	6%	94%	
			<b>1992 and later</b>	2	14	<b>16</b>
<b>1991 and earlier</b>	17/37	= <b>46%</b>	Percent	13%	88%	
<b>1992 and later</b>	16/59	= <b>27%</b>	<b>Grand Total</b>	3	30	<b>33</b>
<b>All study</b>	33/96	= <b>34%</b>	Percent	9%	91%	

**Telemetry dens on the Arctic NWR 1002 land or adjacent fast ice**

Land and Fast Ice Dens			1002 Dens	Substrate		
				Fast	Land	Total
Percentage of land and fast ice telemetry dens in the primary study area (167° W to 137° ) that fall within the 1002 area			<b>1991 and earlier</b>	1	12	<b>13</b>
			Percent	8%	92%	
			<b>1992 and later</b>	1	11	<b>12</b>
<b>1991 and earlier</b>	13/37	= <b>35%</b>	Percent	8%	92%	
<b>1992 and later</b>	12/59	= <b>20%</b>	<b>Grand Total</b>	2	23	<b>25</b>
<b>All study</b>	25/96	= <b>26%</b>	Percent	8%	92%	

References:

Amstrup, S.C. and C. Gardner. 1994. Polar bear maternity denning in the Beaufort Sea. J. Wildl. manage. 58: 1-10

