

MOVEMENTS OF ALASKAN POLAR BEARS INSTRUMENTED WITH SATELLITE TRANSMITTERS

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In 1974, the National Aeronautics and Space Administration (NASA) gave permission to the U.S. Fish and Wildlife Service to track polar bears (*Ursus maritimus*) with the Nimbus-66/Random Access Measurement System (RAMS). Kolz et al. (1978) presented results of this effort in 1977. Additional satellite telemetry was attempted in Alaska in 1979 (Taylor 1982). I combined and re-analyzed the results of those programs and suggest that many of the "movements" observed were actually transmitters drifting on floe ice.

METHODS

Polar bears were located by helicopter and immobilized according to procedures described by Jonkel (1967, 1970), Lentfer (1968), and Larsen (1971). Three adult female polar bears (bears 1793, 1794, 1795) were fitted with transmitters compatible with the Nimbus-6 system in 1977 (Kolz et al. 1978) and 3 more (bears 337, 4060, 470) in 1979. All polar bears were captured and released off Point Barrow, Alaska.

To obtain information on ice drift, a conventional radio transmitter was placed on an ice floe north of Point Barrow in spring 1980 and relocated by aircraft on 30 July 1980.

RESULTS AND DISCUSSION

Kolz et al. (1978) discussed the movements of polar bears instrumented in the spring of 1977. Bear 1795 traveled east against the ice drift for 10 days (Fig. 1). An abrupt shift in direction was recorded on 28 June 1978. Kolz et al. (1978) presumed that the transmitter remained on the bear and presented an analysis based on that assumption. Sorenson (unpubl. data) noted that after 28 June 1977 the track of the transmitter was the same as the ice drift. Figure 1 compares the drifting radio transmitter (1980) and that of bear 1795 from the same area in 1977. While the ice conditions are not identical each year, the paths taken by the drifting radio and transmitter 1795 were only 60 km apart after 109 days.

Sorenson (unpubl. data) indicates that bear 1795 was in the vicinity of the ice edge, but in the Chukchi

Sea the summer ice edge is often indistinct, grading from slush ice to multi-year floes. The multi-year ice edge was farther south than most satellite locations during 1977. The summer track of bear 1795 was north of the heavy multi-year edge (Fig. 1) in an area of relatively low primary production, low seal density, and generally poor polar bear habitat.

Kolz et al. (1978) suggest that bear 1795 searched for a maternity den on the sea ice north and west of Wrangel Island (Fig. 1). Wrangel Island is noted as an area of concentrated maternity denning (Uspenskii and Chernyabskii 1965, Harrington 1968, Uspenskii and Kistchinskii 1972). It seems doubtful that bear 1795's autumn movements took it past a traditional maternity denning area into what appeared from satellite photographs to be marginal polar bear habitat.

In spring 1979, the Alaskan satellite telemetry project had only 1 transmitter (bear 337) that operated effectively. Bear 337 was an estrous female when captured. She appeared to move 200 km ENE from the capture site (Fig. 1). There were 56 days between a location north of Point Barrow and the next location NNE of the Colville Delta. The direction of this movement was against the ice drift, but movements determined from locations received after 30 June 1978 were indiscernible from the ice drift.

Transmitter 4060 was relocated once, 14 km west of the capture site, 8 days after capture. This movement was indiscernible from ice drift.

The satellite telemetry data from Alaska suggest north and east movements of polar bears in the Point Barrow area before and during spring breakup. This pattern agrees with Lentfer's (1974, 1983) resightings of marked polar bears in the same tagging season. But the 2 post-spring movements (bears 1795 and 337) were almost certainly records of ice drift, not polar bear movement. I suggest that bears 1795 and 337 either lost their collars or died, the former being more likely.

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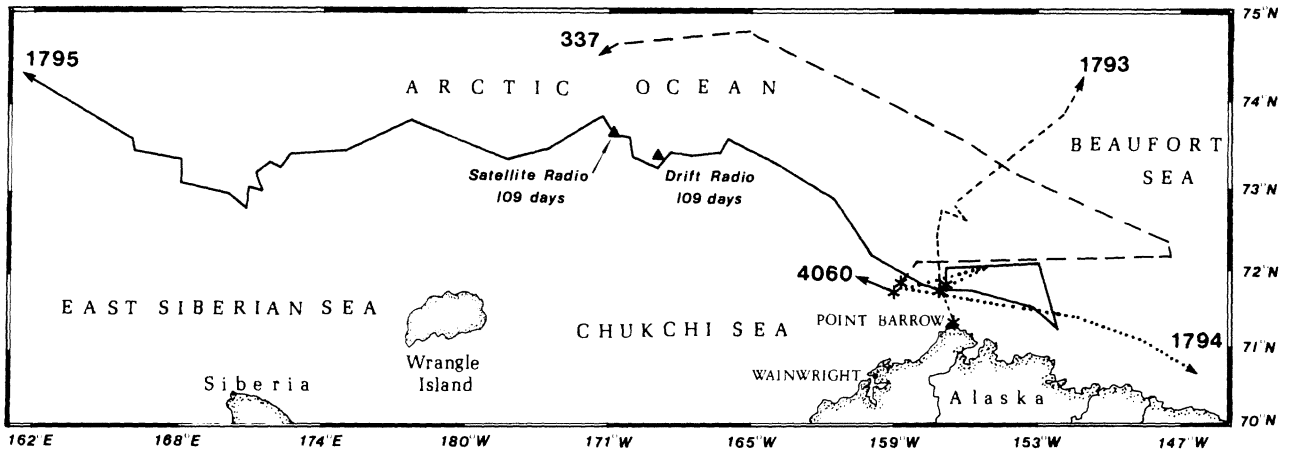


Fig. 1. The location of the drifting radio (triangle) and bear 1795's transmitter (triangle) are indicated 109 days after they were released north of Point Barrow. Satellite transmitter 1795 was deployed in 1979 and the RF radio beacon was let drift on an ice floe in 1980. The asterisks clustered around Point Barrow indicate the positions where the satellite transmitters were deployed.

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LITERATURE CITED

HARRINGTON, C. P. 1968. Denning habits of the polar bear. *Can. Wildl. Serv. Rep. Ser.* 5.

JONKEL, C. J. 1967. Life history, ecology and biology of the polar bear, autumn 1966 studies. *Can. Wildl. Serv. Prog. Notes* 1:2-8.

_____. 1970. Polar bear research in Canada. *in* Productivity and conservation in northern circumpolar lands. IUCN Publ., Morges, Switzerland. New Ser. No. 16:150-55.

KOLZ, A. L., J. W. LENTFER, AND H. G. FALLECK. 1978. Polar bear tracking via satellite. *Rocky Mount. Bioeng. Symp.*, Ames, Iowa. 15:137-44.

LARSEN, T. 1971. Capturing, handling and marking polar bears in Svalbard. *J. Wildl. Manage.* 35:27-36.

LENTFER, J. W. 1968. A technique for immobilizing and marking polar bears. *J. Wildl. Manage.* 32:317-321.

_____. 1974. Discreteness of Alaskan polar bear populations. *Int. Cong. Game Biol.* 11:323-329.

_____. 1983. Alaskan polar bear movements and mark and recovery. *Arctic* 36:282-288.

TAYLOR, M. K. 1982. The distribution and abundance of polar bears (*Ursus maritimus*) in the Beaufort and Chukchi Seas. Ph.D. Thesis, Univ. Minn., Minneapolis. 465pp.

USPENSKII, S. M., AND F. B. CHERNYABSKII. 1965. Maternity home of the polar bear. *Priroda* 4:81-86.

_____, AND A. A. KISTCHINSKII. 1972. New data on the winter ecology of the polar bear (*U. maritimus*) on Wrangle Island. *Int. Conf. Bear Res. and Manage.* 2:181-97.