Variation in Denning and Parturition Dates of a Wild Gray Wolf, *Canis lupus*, in the Rocky Mountains

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A radio-collared wild Wolf (*Canis lupus*) which had lost her alpha status and left her pack in 1987 denned one month later than she had in 1985 and 1986. We calculated that she bred approximately 15–20 March in 1987 in contrast to dates of 24 and 15 February in 1985 and 1986 respectively, when she was still with the pack.

Key Words: Gray Wolf, *Canis lupus*, estrus, denning, parturition, Rocky Mountains.

The reproductive physiology of Gray Wolves (*Canis lupus*) has been studied in captive and wild wolves (Packard et al. 1983; Packard and Mech 1983; Mech and Seal 1987; Packard et al. 1985; Seal et al. 1979), but, except for Fuller (1989), variation in denning or parturition dates has not been documented for wolves. One record of multiple or extended estrus was reported in a captive coyote (Harrington 1987).

Gray Wolves we studied in northwestern Montana and southeastern British Columbia generally have had consistent denning times. Denning dates were defined as the date a radio-collared wolf was first found at the den and subsequently remained there for at least two weeks. Six females denned a total of 16 times from 1985-1991; other than the exception reported in this paper, the average denning date was 18 April (range 5-28 April), similar to denning dates at this latitude (Mech 1970; Fritts and Mech 1981; Fuller 1989). One typical wolf, W8653, denned five times from 1987-1991; her average denning date was 18 April (range 12-22 April).

However, this note reports on a wolf whose denning dates varied by about one month. Lactating female wolf W8550 was captured and radio-collared in southeastern British Columbia on 18 May 1985 (Ream et al. 1991). She was estimated to be three years old based on tooth wear and history of an intensively studied, low-density, recolonizing wolf population (Ream et al. 1991). She was the alpha female and the only breeding female in the pack in 1985. On 26 May 1885, W8550 was aerially observed nursing seven black pups and playing with them. The pups were estimated to be one month old, based on size and physical coordination (Mech 1970): their heads were over-sized and legs short; they romped with each other, walked well, and ran after W8550 when she walked away from them. The approximate date of conception was estimated to be 24 February, calculated from a 62-day gestation period (Mech 1970).

In 1986, W8550 maintained her alpha status and denned in Glacier National Park, Montana, between 14 and 17 April, 28 km south of her 1985 den (Ream et al. 1989). She moved throughout her home range until mid-April and was 6 km southeast of her den on 13 April. She was located at her den on 17 April and was there for 96% of telemetry locations ($N = 52$) from 17 April – 17 May. Assuming she gave birth shortly after denning, her date of conception was estimated to be approximately 15 February.

On 28 May 1986, a young-adult female, W8653, was captured and radio-collared. She was probably W8550's daughter from the 1985 litter, and had a strong fidelity to W8550 and the 1986 den. W8550 was observed with five gray pups near the den on 31 July 1986. On 9 October 1986, a female pup of W8550's, W8654, was captured and radio-collared. By fall, the pack consisted of ten wolves, three of which were radio-collared.

All ten pack members travelled together through 24 January 1987. On 25 and 26 January 1987, W8653 and W8654 were located together, but W8550 could not be located. On 27 January, nine wolves, including W8653 and W8654, were aerially observed together, while W8550 was located 25 km northwest of the pack. W8653 was first located at her den in Glacier National Park 30 km south of the Canadian border on 23 April 1987, after being located 10 km northwest on 21 April. She was located at the den on 98% ($N = 44$) of locations from 23 April – 22 May.

W8550 remained alone for most of the winter after she separated from the pack, except for 6 February 1987 when she was located with the pack. She was heard howling with another Wolf on 27 February 1987.

W8550 roamed throughout the northern portion of the pack's home range April 2 through 17 May (16 locations). On 5 May, W8550 was observed with two Wolves 1 km north of her den. She was located at her den in British Columbia on 22 May, 44 km southeast of her 17 May location and was located at the den on 75% ($N = 20$) of locations from 22 May – 22 June. This 1987 den was less than 1 km from her 1985 den and 40 km north of W8653's 1987 den.

Assuming she whelped with a few days of denning, her date of conception was estimated to be approximately 15–20 March. This is one month later than her previous conception times and than conception times reported for all other wolves at about this latitude (Mech 1970; Fritts and Mech 1981; Fuller 1989). In May and June, she was joined by two more wolves, including W8654, and five pups were successfully raised.

W8550 did not leave her den site for approximately one month after initially denning during each of the three years she was monitored. In 1985 and 1986 when W8550 was the alpha female of the pack, her denning dates varied by only nine days. After being displaced as alpha and becoming a loner prior to the breeding season in 1987, she denned one month later than the previous two years. Assuming den selection and subsequent time of parturition to be consistent within a given female's behavior, it appears that W8550 bred one month later than usual after she left the pack. Wolves generally are in estrus about 7-15 days (Zimen 1976) and the mechanisms for the variation in W8550's denning, parturition, or estrus are unknown. Although social and physiological influences on reproduction in Wolves have been intensively investigated (Packard et al. 1983; Packard and Mech 1983; Mech and Seal 1987; Packard et al. 1985; Seal et al. 1979), none of the literature (or L. D. Mech, personal communication) reported this kind of variation in dates of reproduction.

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Literature Cited

Fritts, S. H., and **L. D. Mech.** 1981. Dynamics, movements, and feeding ecology of a newly protected wolf population in northwestern Minnesota. Wildlife Monographs 80: 1–79.

Fuller, T. K. 1989. Denning behavior of wolves in north-central Minnesota. American Midland Naturalist 121: 184–188.

Harrington, F. H. 1987. Multiple or extended estrus in a coyote (*Canis latrans*). American Midland Naturalist 117(1): 218–220.

Mech, L. D. 1970. The Wolf: the ecology and behavior of an endangered species. Natural History Press. Garden City, New York. 384 pages.

Mech, L. D., and **U. S. Seal.** 1987. Premature reproductive activity in wild wolves. Journal of Mammalogy 68(4): 871–873.

Packard, J. M., and **L. D. Mech.** 1983. Population regulation in wolves. Pages 151–173 *in* Symposium on natural regulation of wildlife populations, 10 March 1978. *Edited by* F. L. Bunnell, D. S. Eastman, and J. M. Peek. Forestry, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Packard, J. M., U. S. Seal, L. D. Mech, and **E. D. Plotka.** 1985. Causes of reproductive failure in two family groups of wolves (*Canis lupus*). Zeitschrift fur Tierpsychologie 68: 24–40.

Packard, J. M., L. D. Mech, and **U. S. Seal.** 1983. Social influences on reproduction in wolves. Pages 78–85 *in* Proceedings of the Wolf Symposium. *Edited by* L. N. Carbyn. Canadian Wildlife Service Report Series Number 45.

Ream, R. R., M. W. Fairchild, D. K. Boyd, and **D. H. Pletscher.** 1991. Population dynamics and home range changes in a colonizing wolf population. Pages 349–366 *in* The greater Yellowstone ecosystem. *Edited by* R. B. Keiter and M. S. Boyce. Yale University Press, New Haven, Connecticut.

Ream, R. R., M. W. Fairchild, D. K. Boyd, and **A. J. Blakesley.** 1989. First wolf den in western U.S. in recent history. Northwestern Naturalist 70: 39–40.

Seal, U. S., E. D. Plotka, J. M. Packard, and **L. D. Mech.** 1979. Endocrine correlates of reproduction in the wolf. I. serum progesterone, estradiol and LH during the estrous cycle. Biology of Reproduction 21: 1057–1066.

Zimen, E. 1976. On the regulation of pack size in wolves. Zeitschrift fur Tierpsychologie 40: 300–341.

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