

Weight Changes in Wild Wolves, *Canis lupus*, from Ages 2 to 24 Months

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Weights of 118 female and 141 male Minnesota Wolves (*Canis lupus*) aged 2-24 months increased almost linearly from about 8 kg for females and 10 kg for males at 3 months to 30 kg for females and 32 kg for males at 10-12 months and then tended to increase much more slowly in an overall curvilinear trend. Considerable variation was apparent for both sexes during their first year.

Key Words: Wolves, *Canis lupus*, weights, growth, development, Minnesota.

Weight changes in free-ranging Wolves (*Canis lupus*) from 3 to 7 months of age have been documented (Van Ballenberghe and Mech 1975), as well as annual changes from 1 to 12 years (Mech 2006). However, weight changes between 7 months and 24 months have not yet been described for wild or captive Wolves. Thus information about the growth and development of wild Wolves remains incomplete. Herein I present information that helps fill that gap.

The study area encompassed some 2060 km² immediately east of Ely in the east-central Superior National Forest (48°N, 92°W) of northeastern Minnesota. Winter temperatures below -35°C are not unusual, and snow depths (usually from about mid-November through mid-April) generally ranged from 50 to 75 cm. Temperatures in summer rarely exceeded 35°C. Conifers predominate in the forest overstory interspersed with large stands of Paper Birch (*Betula papyrifera*) and Trembling Aspen (*Populus tremuloides*). Detailed descriptions of the forest vegetation were presented by Ohmann and Ream (1969).

Wolves in the study area feed primarily on White-tailed Deer (*Odocoileus virginianus*), Moose (*Alces alces*), and Beavers (*Castor canadensis*; Frenzel 1974). The Wolves have been legally protected since 1974, although some have been killed accidentally or illegally by humans (Mech 1977). The Wolf population in the study area has remained relatively stable since about 1975, after dropping following a major deer decline (Mech 2000:23). The study population has long been saturated and in the late 1970s, canine parvovirus infected the population, resulting in a strong decrease in young pup survival ever since (Mech et al. 2008).

The taxonomic identity of the Wolves in this study is uncertain. Nowak (1995) considered them *Canis lupus nubilus* based on skull morphology. However, the population includes animals with the same mitochondrial DNA haplotypes as some Wolves in Alaska and western Canada, as well as animals with Coyote (*Canis latrans*)-like haplotypes also found in eastern Ontario (Lehman et al. 1991). Nevertheless no morphological differences between Wolves of these two

mitochondrial DNA haplotypes have been recognized, and both types inhabit the same packs (Lehman et al. 1992). Wilson et al. (2000) suggested that Minnesota Wolves may be assignable to a newly postulated species, *Canis lycaon*. A less powerful genetic test was consistent with the population being *Canis lupus* or hybrids between *Canis lycaon* and *Canis lupus* (Mech and Federoff 2002).

Most of the Wolves I studied were live-trapped in modified, steel foot traps (Mech 1974) from about 16 Wolf packs throughout the study area from June through December 1970 through 2006. The Wolves were anesthetized and weighed on a spring scale, (Chatillon 160, Largo, Florida, until 1999; and Salter ABS, Santee, California, since then). Pups were distinguished by their milk teeth or newly erupted adult canines (Van Ballenberghe and Mech 1975). Two male and two female pups were then outfitted with capture collars (Mech and Gese 1992), anesthetized remotely, and weighed 6-11 times more through ages 23 months for females and 19 months for males. Contrary to animals captured in live-traps, those captured by capture collars sometimes have food in their stomachs. I estimated the amounts by observing the degree to which the stomachs were distended and subtracted those estimates from the total weights.

Weights were obtained from 152 captures of 118 females and from 176 captures of 141 males. Weights of both sexes increased almost linearly from about 8 kg for females and 10 kg for males at 3 months to 30 kg for females and 32 kg for males at 10-12 months and then tended to level off and increase more slowly (Figure 1). Considerable variation was apparent for both sexes during their first year. This variation is no doubt due to variation in amount of food available as well as to competition within litters for the available food. In addition, some pups with low weight might not have survived long enough to contribute data as older pups.

These results agree with Kuyt (1972) for captive Wolves 1-3 months old and those of Pulliainen (1965, cited in Mech 1970: 124) for single captive Wolves

Figure 1A.

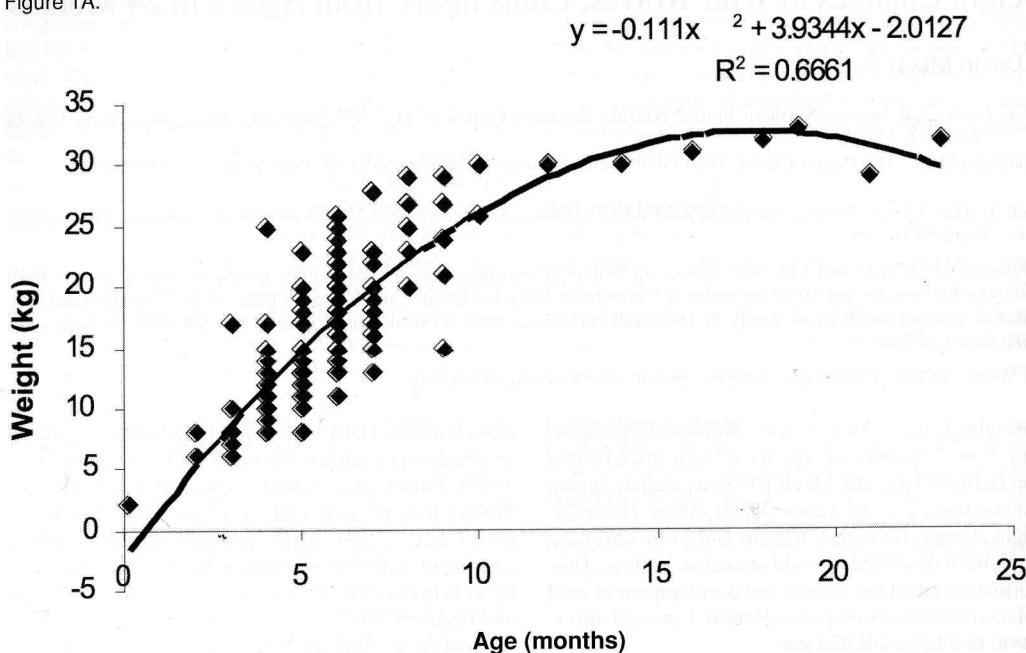


Figure 1B.

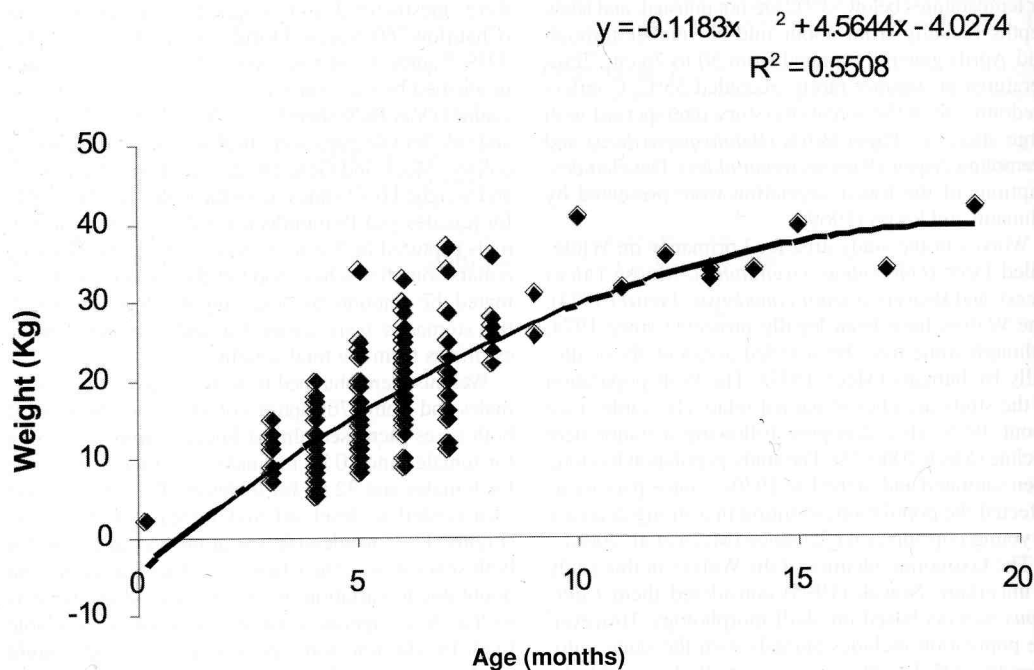


FIGURE 1. Weight changes in Wolves from the Superior National Forest in northeastern Minnesota, 1970-2006. A. females 2-23 months old (1970-2004). B. males 3-19 months-old, (1970-2006). (Assumed 0.5 kg birth weight to complete trend line [Rutter and Pimlott 1968].)

from 3 to 7 months. However growth (1965) Finnish captives began leveling off at 11.5 months (male) and 12 months for both sexes of Minnesota. It is not clear whether the difference in leveling off is due to different races or to nutrition of captive Wolves.

This study helps complete gaps in knowledge about the weight changes of wild Wolves from 3 months of age to 12 years of age. In all, the pattern of weight gain in wild Wolves in the first two years of age followed a curve similar to that of captive Wolves. However, more data are still needed on male and female Wolves 5-12 years old.

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from 3 to 7 months. However growth of Pulliainen's (1965) Finnish captives began leveling off at 7 months (female) and 11.5 months (male) rather than at about 12 months for both sexes of Minnesota wild Wolves. It is not clear whether the difference in age of growth leveling off is due to different races of Wolves or better nutrition of captive Wolves.

This study helps complete general information about the weight changes of wild Wolves from about 3 months of age to 12 years of age (Mech 2006). Overall, the pattern of weight gain in wolves within the first two years of age followed a curvilinear relationship. However, more data are still needed for both male and female Wolves 5-12 years old.

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