

Can non-lethal methods effectively reduce wolf numbers?

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Results of the Aishihik wolf fertility control experiment

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The Yukon Wolf Conservation and Management Plan (1992) recommended that

Non-lethal methods of controlling or reducing wolf numbers such as birth control should be considered if these methods are shown to work for reducing wolf numbers to levels at which experimental designs would predict a substantial increase in ungulate populations.

To determine if non-lethal methods could be a viable option of reducing wolf numbers, between 1994 and 2003 we surgically treated 23 wolves (13 males and 10 females) from 11 packs as part of the Aishihik caribou recovery program (Hayes et al. 2003).

Vasectomy and uterine tubal ligation procedures in wolves are similar to the surgical procedures done in humans. These are not the same as neutering or spaying a dog or cat (wolf ovaries/uterus or testicles were not removed). Therefore, wolves produced hormones normally, retained pair-bonds, likely bred, and showed denning behaviour in the spring (Mech et al. 1996, Spence et al. 1999).

Some treated animals changed pack affiliations over the 11-year study period and other packs died out, resulting in 11 treated groups with which we were able to maintain contact for at least one season. The number of packs with a treated animal varied from year to year (range 1 to 6) for a total of 37 “pack years” observed over the project period. We documented no pups in 32 of the 37 pack years where litters of pups might have been produced. All 5 instances where pups were observed occurred in the season immediately following sterilization. We assume that breeding had already occurred prior to capture and surgery.

Sterilizations significantly slowed the recovery of wolf numbers by up to 58% annually (Hayes et al. 2003).

We observed that the 11 fertility-treated groups (usually pairs), were able to hold their territories against reproductive competitors from 1 to 7 years (average 3.75 years). Sterilized pairs maintain territories similar in size to a family group, exclude other wolves, and eat significantly less moose and caribou than breeding packs (Spence et al 1999).

Surgical sterilization was able to maintain wolf numbers at levels at which we would predict a substantial increase in ungulate populations. Because this study was done in an area where wolf numbers had already been reduced through lethal control we were able to treat small groups of

re-colonizing wolves for immediate effect rather than have to treat many males and wait for attrition to reduce pack size.

Towards the end of the study (2000-2003), we also attempted to test an immuno-contraceptive vaccine. The focus of these tests was to determine if there was a multi-year effect to the vaccine treatment. Eleven females were vaccinated with 1 of 2 variants of the immuno-contraceptive vaccine PZP (Porcine Zona Pellucida); most were members of packs in which either one or both of the dominant animals had been surgically treated. Blood tests determined that antibody levels to both variants were considered unlikely to prevent pregnancy, with the possible exception of the year of administration. Even if immuno-contraception had proven to be a viable technique to prevent pregnancy in wolves, it is no longer an option: the vaccine manufacturer has since dissolved and the patents sold to a human vaccine company.

Conclusion

We found that surgical sterilization effectively maintained reduced population levels over several years but immuno-contraception was not a viable tool for reducing the number of pups born.

Practical considerations

Initial wolf population size

This study was done in an area where wolf numbers had already been reduced through lethal control. We found that low wolf numbers could be maintained but further investigations in areas of natural wolf numbers are warranted.

Surgical procedures

Surgical procedures were performed on male (vasectomy) and female (tubal ligation) wolves in both field and in clinical settings. Vasectomies for males were viable in the field, but tubal ligation procedures for females were not viable except in a sterile clinical setting.

A wolf vasectomy is a minor procedure that takes less than 15 minutes, and does not enter the abdominal cavity, so infection or complications resulting from surgery are rare. Vasectomies can and should be done in the field by a veterinarian to avoid the stress and additional risks to the animal from transport and holding (as well additional cost).

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Timeline of surgically treated wolves.

Pack	Sex	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Comment
Kloo Lake	M			●				●				old age
	F						●					Killed by new female?
	F											pup born in 1999 by new female and male
Swanson pair	F											
	M											
Jarvis Pair	F											
	F											female from Jarvis pair
Lister Creek	F											
	M											
	M											dispersed
Hopkins	F											
	M											killed by new female? shot outside territory - displaced by new male
Talbot	F											
	M											spontaneous infection
	F											killed by new male?
Onion	M											dispersed
	F											killed by border pack
	M											killed by border pack
MacIntosh	F											dispersed
	M											shot by hunter
	F											dispersed outside study area
Gladstone	M											dispersed outside study area
Dwarf Birch	M											
Swan Pair	M											
Black Birch	F											
	M											
	M											