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HOME RANGE DYNAMICS OF WOLF PACKS ON WINTER RANGE OF THE WESTERN ARCTIC CARIBOU HERD

By

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SUMMARY

This project was designed to determine the spatial organization and movements of wolf packs (Canis lupus) during late winter on the Western Arctic Caribou (Rangifer tarandus) Herd (WACH) winter range, and to evaluate the accuracy and reliability of the wolf aerial survey technique used by the Game Division mainly in Interior and Southcentral Alaska. Environmental conditions under which the survey technique is successfully applied often do not exist in Northwestern Alaska. Therefore, results of wolf surveys in Northwestern Alaska are probably subject to an unknown but greater degree of error. Results of this research project were intended to be used as follows: 1) to identify the cause and extent of errors in wolf population estimates resulting from the survey techniques, and 2) to modify the technique or at least incorporate the limitations of it into the data analysis.

Beginning 2 March 1983, Game Division personnel attempted to radio-collar 3 wolves in each of up to 8 packs. Only 1 pack was located during 3 days of searching a 7,700 km^2 area including the Selawik Hills, Buckland River, and Tagagawik River in southern Game Management Unit (GMU) 23. One young adult male wolf was radio-collared, but attempts to radio-collar additional wolves in the same pack at a later date were canceled when it became apparent that no other packs could be located. Success of the project depended on radio-marking at least 5 packs; the project was therefore terminated.

In conclusion, the necessity to continue using the wolf aerial survey technique, despite its shortcomings, was acknowledged. The need for a research project to evaluate the applicability of the survey technique still exists, but a substantially higher wolf population must be present to successfully conduct the project.

Key words: aerial survey, Canis lupus, caribou, radio-collar, Rangifer tarandus, wolf.

CONTENTS

BACKGROUND

The wolf aerial survey technique (Stephenson 1978) is used routinely in late winter by Game Division biologists to estimate the number of wolves (Canis lupus) in specific areas throughout much of Alaska. This method has been tested and proven to be highly accurate in Southcentral Alaska (Stephenson 1978, W. Ballard, unpubl. data) where wolf pack territories are stable, where wolf densities do not exceed approximately 1 wolf/65-90 km^2, and where wolf surveys are completed within relatively short periods of time. However, the applicability of this technique may be limited in northern Alaska on winter range of the Western Arctic Caribou Herd (WACH) for the following reasons: 1) Many wolf packs are migratory (Kelly 1954, Stephenson 1979, Stephenson and James 1982, James 1983) and may not maintain territories during winter; 2) Wolf densities on caribou (Rangifer tarandus) winter range may be as high as 1 wolf/16 km^2 in the vicinity of winter aggregations of caribou (Kelly 1954, Kuyt 1972, Miller 1975, J. Davis, pers. observ.); and 3) Wolf surveys on the WACH range often require relatively long periods of time to complete because of frequent poor weather and difficult logistics.

The accuracy of existing wolf aerial survey techniques on winter range of the WACH is unknown primarily because the degree of stability of wolf pack territories during late winter when surveys are conducted is unknown. If territories are not stable during this period, then movement of packs may cause some animals to be missed or counted twice. If pack territories are unstable, additional errors in density estimates may result when surveys are extended over several days, thereby allowing more time for movement of packs.

If unstable pack territories or other factors decrease the reliability of the wolf aerial survey technique, then the cause and extent of errors in wolf population estimates using the technique should be identified. Some modification of the technique may be possible; minimally, realizing the technique's limitations will make it more useful in Northwestern Alaska.

OBJECTIVE

To determine the spatial organization and movements of wolf packs during late winter on the WACH winter range, and to evaluate the accuracy and reliability of the wolf aerial survey technique.

STUDY AREA

The area chosen for this investigation was the Selawik Hills/ Buckland River/Tagagawik River portion of GMU 23. The study area is bounded on the north and south by 66° 30' N and 65° 15' N latitude, respectively, and on the west and east by 161° 30' W and 158° 30' W longitude, respectively. According to Wahrhaftig's (1965) physiographic nomenclature, this area falls within the Western Alaska Province and consists primarily of the Selawik Hills and Buckland River Lowland sections. The Selawik Hills are generally rounded, rising steeply to the north and declining gently to the south, with summits to 1,015 m. The Buckland River Lowland varies from sea level to 308 m and is a gently rolling, open lowland dissected by several tributaries. Tundra is the predominant vegetation, with shrubland localized on protected upland slopes and river valleys. Spruce (Picea spp.) forest is even more localized on some riparian sites and on some upland slopes on the southern edge of the study area.

The Selawik Hills/Buckland River area is one of the 3 most important winter ranges of the WACH. The herd has used this area consistently for at least the last 30 years, even during the mid-1970's when the herd had declined to approximately 75,000 animals (Davis and Valkenburg 1978). This area is also a well-known favorite location for aerial and snowmachine-borne wolf trappers and wolf hunters (D. James, pers. observ.), because relatively large numbers of wolves are frequently present in winter along with the caribou.

METHODS

Attempts to initiate the study failed; the following is a description of how the study was to have been accomplished.

Three wolves in each of up to 8 packs were to have been radio-collared in February or March 1983. Fixed-wing aircraft were used to locate wolves, and a standard helicopter darting technique using M99 was the means of capture. Instrumented wolves were to have been located twice weekly for the remainder of the late winter and spring. These locations would have been used to define a minimum area home range (Mohr 1947) for each pack and to determine whether each pack occupies an exclusive home range (territory) or whether different packs share a common home range. The study wolves were to have been located at 4- to 8-week intervals during summer and fall to determine seasonal movement patterns.

Wolf density in the study area was to have been estimated independently in the following 2 ways: 1) by using radio-collared individuals to help locate packs, and 2) by using the conventional wolf aerial survey technique. The results of method #1 would have been considered more accurate than those of method #2. Any discrepancy in density estimates would have been analyzed in light of the detailed movement and distribution data obtained by radio tracking. This analysis would have been the basis for a modified survey technique suitable for conditions encountered on caribou winter range in Northwestern Alaska.

RESULTS AND DISCUSSION

On 2-4 March 1983, Game Division personnel attempted to locate and radio-collar wolves in the study area which contained 40,000-60,000 wintering caribou. During 3 days of searching the 7,700 km^2 area, a pilot-observer team in a Super Cub was able to locate only 1 pack of wolves and 26 additional sets of tracks. Nor were any wolves seen by an on-the-ground observer using a spotting scope on high vantage points, a technique used successfully in the Western and Central Brooks Range in the past. Very poor snow conditions in the Selawik Hills area (where most of the caribou were located) and marginal conditions to the east limited our ability to make aerial and, to a lesser degree, on-the-ground observations. Wolves and wolf signs probably would have been observed more often under ideal tracking conditions. Even so, fewer wolves were observed than would be expected for an area in which one-third of the WACH was wintering.

One radio collar was attached to a young adult male wolf in the only pack observed. Attempts to radio-collar additional wolves in this pack at a later date were canceled when it became apparent that no other packs could be located. This decision was made as a result of previous agreement by agency principals that if the primary objective of the study (which required a relatively large number of radio-marked packs) could not be met, then the study should be terminated.

The single radio-collared wolf was shot less than 1 month after collaring, approximately 6 mi from where it was captured on the lower Tagagawik River. The radio collar was returned to the Kotzebue Fish and Game office.

Pending the outcome of a successful research project, the applicability of the wolf aerial survey technique in Northwestern Alaska will remain conjectural. In the meantime, the survey technique remains the only way to estimate wolf abundance even if results are ambiguous relative to those obtained elsewhere in Alaska.

Observations from this study and associated management activities suggest that the wolf population is productive but has been stabilized at a low-to-moderate level by hunting, trapping, and perhaps other mortality. Inability to locate more than 1 wolf

pack during the radio-collaring attempt suggests that wolves were relatively scarce. When wolves were last known to be abundant in the study area (mid-1970's), wolf signs, including caribou carcasses, tracks, and chance sightings of wolves, were frequently observed on caribou winter range (P. Valkenburg, pers. commun.). During the 1983 radio-collaring attempt, caribou carcasses other than those apparently killed by hunters were rarely observed, wolf tracks were relatively scarce, and no chance sighting of wolves were made. Local hunters and trappers, however, believe that wolves have increased during the past 2 years. This belief is consistent with the fact that 12 wolves were reported harvested in the study area during winter 1982-83, and at least 30 more were believed to have been taken by local hunters and trappers, but not reported. If the harvest was actually that large, wolf densities must have been moderate-to-high prior to winter hunting and trapping removal.

RECOMMENDATIONS

This research project, or one similar to it, should be initiated when it becomes apparent that wolf packs are sufficiently numerous to ensure successful radio collaring.

The conventional wolf aerial survey technique should continue to be used in Northwestern Alaska, with the realization that results will be more difficult to interpret and possibly less accurate than those obtained from Interior and Southcentral Alaska.

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