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DEVELOPMENT OF LYNX POPULATION ESTIMATION TECHNIQUES

By

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PROGRESS REPORT (RESEARCH)

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SUMMARY

Six adult lynx (Lynx canadensis) were radio-collared on the Wood River study area south of Fairbanks. These 3 males and 3 females were relocated a total of 386 times at intervals of from 1 to 7 days. Five lynx were residents of the study area, with home ranges varying from 52 to 130 km² (20 to 50 mi²). One female lynx left the study area 2 months after being radio-collared and traveled as far as 65 km (40 mi) from the study area in April and May.

An evaluation of the status and management of lynx in Interior Alaska was completed. The results of this analysis are summarized.

Key words: Interior Alaska, lynx, Lynx canadensis, population ecology, trapping.

CONTENTS

BACKGROUND

The justification and background for current lynx (Lynx canadensis) studies in Alaska were described in detail in a previous report (Stephenson 1984). The present study will provide needed information about the ecology of lynx and lynx populations, the status of lynx in Alaska, and the effects of harvests by man on lynx population cycles. Underlying this effort to learn more about lynx is a widespread concern among trappers and wildlife managers in Alaska and Canada about the status of lynx. This concern is prompted by increased trapping pressure on lynx as a result of high pelt prices during the past decade and the knowledge that lynx are highly vulnerable to trapping.

OBJECTIVES

To develop criteria for aerial and on-the-ground identification of lynx tracks in snow.

To determine the sightability of lynx trails in snow from the air and ground in different habitats.

To obtain information on movements, home range, and dispersal of individual lynx.

To determine travel routes of lynx in relation to habitat.

To assess the timing and extent of movements of lynx in relation to season, weather, and snow conditions.

To determine the population density of a lynx population to provide a basis for testing enumeration techniques and for estimating numbers in larger areas.

To develop and test various types of aerial and ground survey techniques, and to develop a method to determine lynx abundance in relative and/or absolute terms.

STUDY AREA

Field work was carried out in the Wood River study area 65 km (40 mi) south of Fairbanks. The study area includes parts of the Wood River and Bonnifield, Gold King, St. George, and Fish Creek drainages and is between 213 and 366 m (700 and 1,200 ft) elevation. The area is adjacent to, and includes, some of the northern foothills of the Alaska Range. Vegetation along drainages consists of mixed stands of mature spruce (Picea spp.), paper birch (Betula papyrifera), aspen (Populus tremuloides), alder (Alnus spp.), and willow (Salix spp.). Open spruce muskeg characterizes poorly drained low elevations and open stands of aspen and spruce are found at higher elevations south and west of the Wood River. The study area is bounded on the east by the 1980 Blair Lakes burn.

An evaluation of the status and management of lynx in Interior Alaska focused on Game Management Units 20 and 25.

METHODS

The methods used to capture, immobilize, radio-collar, and monitor lynx were similar to those used in winter 1983-84 (Stephenson 1984). During November 1984, insufficient snow precluded extensive snowmachine travel and only live traps were used on a trapline adjacent to the Wood River. These were checked every 1-2 days using a Honda 4-wheeler ATV. In early December, padded 1-1/2 coil spring traps were used briefly along the Bonnifield Trail. During March and early April, padded traps were used extensively on the Bonnifield and Rex Trails and on the Wood River. The 41-km (25.5-mi) trapline was checked daily by snowmachine between 3 March and 23 March 1985. Radio-marked lynx were located once or twice daily by triangulation from the ground while field work was in progress. During the remainder of the year, aerial radiolocations were obtained at intervals of 3-10 days with occasional intervals of as much as 30 days during periods of inclement weather.

RESULTS AND DISCUSSION

Telemetry Studies

Intensive field work was conducted from 5 November until 4 December 1984 and from 1 March until 6 April 1985. During

early winter, below-normal snowfall restricted travel by snowmachine and hampered efforts to radio-collar additional lynx. However, an adult male lynx was captured and radio-collared on 4 December.

A heavy snowfall in mid-December and additional snow through the remainder of winter provided good travel and trapping conditions. Five lynx were captured in mid- to late winter, including 2 that had been previously radio-collared. An adult female was captured and radio-collared on 22 January 1985 by cooperating trapper D. Smith. An adult female was captured on 10 March, and an adult male was captured on 15 March. The adult female and adult male radio-collared in March 1984 were recaptured and fitted with new radio collars in March 1985. When capture efforts ceased in early April 1985, there were 6 radio-marked lynx in the study area. These lynx have been located regularly since their release, and by 15 May 1985 individual lynx had been located from 28 to 129 times, with a total of 386 relocations.

Five of the instrumented lynx have remained within small home ranges that are from approximately 52 to 130 km^2 (20 to 50 mi^2) in size. The female radio-collared in January 1985 left her home range about 1 April, moving generally east. By 6 April she was 39 km (24 mi) east of the area used during the previous 2 months and by 21 April had moved an additional 27 km (17 mi) east to an area 13 km (8 mi) southeast of the mouth of the Little Delta River. The lynx then moved 24 km (15 mi) southwest and by 29 April was located at the edge of the foothills of the Alaska Range, 8 km (5 mi) east of Dry Creek. The southward movement continued, and on 14 May the lynx was found in the upper Wood River valley 45 km (28 mi) south of the area used prior to dispersal. No further relocations have been obtained although the frequency has been monitored on several occasions in areas previously frequented by the lynx. It is possible the animal is in some of the smaller drainages in mountainous terrain or has moved farther south or west.

The data on movements, home range, and dispersal of individual lynx are being analyzed. The movements of radio-collared lynx have provided considerable information on lynx travel routes in relation to habitat and the timing and extent of movements in relation to season, weather, and snow conditions. This information will be presented in the final report.

During each period of field work, the total number of lynx in the study area has been estimated based on the known movements of radio-marked lynx and the occurrence of tracks. In addition, the accumulation of lynx track crossings of the 41-km (25-mi) trapline has been closely monitored and recorded following fresh snowfall, as described by Stephenson (1984).

The frequency of lynx tracks provides the most promising method of determining lynx population status and the Wood River data will help evaluate this index.

Lynx, fox (Vulpes vulpes), and coyote (Canis latrans) scats were collected as opportunities arose. Observations of lynx encounters with prey, based on tracks and kill remains, were recorded. In addition, some information on breeding and denning chronology and behavior has been obtained. Data on food habits and behavior will be presented in the final report.

Evaluation of Lynx Status and Management in Interior Alaska

During 1984 I reviewed knowledge of lynx movements, distribution, population density, reproduction, natural mortality, historic and current harvests by man, trapline distribution, chronology of harvest, and pelt primeness. The primary goals of this analysis were to determine, to the extent possible, the effect of existing trapping harvest on lynx and to reevaluate management strategy in view of current knowledge about lynx ecology. This analysis will be included in the final report due in March 1986.

The analysis led to the conclusion that trapping has a significant effect on lynx populations in many areas and that trapping mortality is largely additive to other mortality, at least during low and increasing phases of the cycle. Reduced trapping during lows should result in higher populations that could subsequently increase faster, allowing a greater long-term harvest of lynx. These conclusions are in agreement with previous studies of the effects of lynx harvest and the opinions of knowledgeable Alaskan trappers. Partly as a result of this analysis, the 1985-86 open season for lynx trapping has been shortened in Game Management Units 11, 12, 13, 14, 16, 20, and 25, to 1 December-31 January.

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LITERATURE CITED

Stephenson, R. O. 1984. Development of lynx population estimation techniques. Alaska Dep. Fish and Game. Fed. Aid in Wildl. Rest. Prog. Rep. Proj. W-22-2. Job 7.12R. Juneau. 19pp.

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