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DEVELOPMENT OF LYNX POPULATION
ESTIMATION TECHNIQUES

By
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Progress Report
Federal Aid in Wildlife Restoration
Project W-22-3, Job 7.12R

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PROGRESS REPORT (RESEARCH)

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Project No.: W-22-3 Project Title: Furbearer Research

Job No.: 7.12R Job Title: Development of Lynx
Population Estimation
Techniques

Period Covered: 1 July 1983 through 30 June 1984

SUMMARY

Efforts to capture and radio-collar lynx (Lynx canadensis) were carried out in 2 areas near Fairbanks. No lynx were captured in the Moose Creek area east of Fairbanks, but an adult male and an adult female were radio-collared during March 1984 in the Wood River study area south of Fairbanks. Efforts to radio-collar additional lynx will resume in October 1984.

An analysis of the effects of harvest on lynx populations is in preparation. The analysis involves determining the extent of potential lynx habitat in various areas and comparing probable population densities at various stages of the cycle with harvests during those periods. To facilitate this analysis, the distribution of traplines in the Tanana and upper Yukon drainages is being mapped. This will provide a better understanding of harvest distribution and identify the location and extent of potential lynx population reservoirs that are not subjected to trapping.

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

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BACKGROUND

The background for current lynx (Lynx canadensis) studies in Alaska has been described in detail in a previous report (Stephenson 1984) and will not be extensively treated here. These studies will provide needed information about the ecology of lynx and lynx populations, the status of lynx in Alaska, the effects of harvests by man on lynx population cycles, and ways in which harvests might be more wisely regulated. 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 the fact that trapping pressure on lynx has increased 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 in relation to habitat.

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

To determine the population density of a lynx population in order 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 develop a method to determine lynx abundance in relative and/or absolute terms.

STUDY AREA

A decline in lynx numbers in most of the Interior and the heavy trapping in virtually all accessible areas made it difficult to find a study area to radio-collar and monitor lynx for an extended period. The search for a study area occupied much of the winter, and fieldwork was attempted in 2 areas.

Between 28 October and 28 November 1983, I attempted to capture lynx and monitored lynx track occurrence in an area between the Chena and Tanana Rivers, 20 miles east of Fairbanks. Lying between Moose Creek and Beaver Creek, this area is part of the Yukon Training Area owned by the U.S. Army and administered by the Natural Resource Office at Ft. Wainwright. With the permission of that office, I was able to use part of an area that had been closed to trapping for several years to protect sensitive recording equipment. The surrounding area is heavily trapped, with lynx being a commonly trapped species, and is comprised of rolling hills between 600 and 1,200 ft in elevation. Vegetation is a mixture of spruce (Picea sp.), paper birch (Betula papyrifera), aspen (Populus tremuloides), alder (Alnus sp.), and willow (Salix sp.). An extensive trail system exists in the area.

In late February 1984, I located another potential study area 40 miles south of Fairbanks, along the Wood River. With the cooperation of Mr. Jim Smith, who has trapped in the area since the late 1960's, trapping efforts were conducted along a 30-mile trail which included parts of the Rex and Bonnifield Trails and the Wood River, beginning on 13 March 1984. This area consists of mixed, mature spruce and hardwood stands in the vicinity of the Wood River, open spruce muskeg, and aspen/spruce parkland on higher elevations south and west of the Wood River. The study area is bounded on the east by the 1980 Blair Lakes burn and is between 700 and 1,200 ft in elevation.

In addition to intensive fieldwork in the aforementioned area, trappers in Ft. Yukon, Tok, Delta, Nenana, and Fairbanks were contacted to obtain information on the status and history of lynx populations.

METHODS

The methods used to capture lynx and monitor their movements were similar to those used in the Tok study area during winter 1982-83 (Stephenson 1984). However, in the Moose Creek area, only live traps were used because the area was visited only every 2-3 days. Both live traps and No. 1-1/2 coil spring traps with padded jaws were used to capture lynx in the Wood River area. Procedures used to immobilize and radio-collar lynx were identical to those used in 1982-83. Travel in both areas was by snowmachine.

RESULTS AND DISCUSSION

Telemetry Studies

Between 28 October and 28 November 1983, 9 live traps were employed in an effort to capture lynx in the Moose Creek study area. Traps were checked every 2-3 days, and the occurrence of lynx tracks was monitored and recorded. Although 2-3 lynx appeared to use the study area, none were captured. One trap was visited but not entered by a lynx. During the early part of this study, 3 lynx were caught by trappers adjacent to the study area, after which the occurrence of lynx tracks declined markedly. Following a fresh snowfall on 28 October, the number of lynx trails crossing 18 mi of trails increased by an average of 0.06 tracks/mi/day, reaching an average by 12 November of 1 track encountered each day for every 1.3 mi of trail examined. Between 12 and 28 November, only 1 fresh track was noted in the study area, suggesting that trapping quickly affected lynx numbers in the study area. Because of the scarcity of lynx in the area, fieldwork was terminated on 28 November.

Fieldwork in the Wood River area began on 13 March 1984 and continued until 5 April when trail conditions began deteriorating rapidly. Both live traps (18) and steel traps (30) were used to capture lynx and were distributed on a 30-mi long route and checked daily. Two lynx were captured and radio-collared. These included an adult male captured on 14 March and an adult female captured on 16 March. Although I estimate that an additional 10-14 lynx inhabited the area, and several encountered traps, no more lynx were captured after 16 March. It appeared that lynx became much less susceptible to traps during the breeding season, as is often reported by trappers. The 2 radio-marked lynx were radio-located almost daily from the ground or with an aircraft between the time they were released and 5 April. After fieldwork ceased, lynx were aerially relocated every 2-4 days. During the period from mid-March to 1 July 1984, the adult male and adult female occupied home ranges of approximately 35 mi² and 30 mi², respectively, located within about 4 miles of the Wood River.

During the coming year, I will continue to monitor radio-collared lynx and, beginning in October 1984, will make a concerted effort to capture and radio-collar additional lynx. Although lynx have declined in many areas in the Interior, both snowshoe hares (Lepus americanus) and lynx remain relatively abundant in the Wood River study area. According to J. Smith (pers. commun.), the area is one of the few places in Game Management Unit 20A where neither hares nor lynx become extremely scarce, even during cyclic lows. As such, the area provides an opportunity for capturing lynx even though lynx numbers are low in most parts of the Interior.

Effects of Harvest on Lynx Populations

An effort to evaluate the effects of lynx trapping is underway which involves 2 types of data analysis. To provide a basis for evaluating past and present harvests, the extent of potential lynx habitat in various Game Management Units and Subunits is being determined using available remote sensing data (LANDSAT and Infrared photographs) and observations of lynx distribution recorded by trappers and Department biologists. The goal of this effort is to derive crude estimates of probable numbers of lynx in specific areas at various phases of the cycle. These estimates will be calculated using population density figures from intensive studies in Alaska and elsewhere in North America. To augment this information, size and distribution data from selected traplines for which historical harvest records are available also will be analyzed. Lynx sealing records accurately reflect size and distribution of lynx harvests since 1977. Limited additional data for earlier years are available in the records of trappers and furbuyers. These data on lynx populations and harvest will be analyzed to evaluate the effects of harvest in specific areas.

An effort to gather information on the distribution of trapping pressure is also in progress. Maps showing trapline distribution in the Tanana and upper Yukon drainages are being prepared based on records provided by the Alaska Trappers Association and information from individual trappers and Department biologists. This information is essential in understanding the impacts of harvest and in detecting the location and extent of population reservoirs that are not trapped. Maps for the Tanana Valley are nearing completion.

The analysis of the relationship between lynx populations and harvest will be completed by early winter so that regulation changes, if necessary, can be prepared and reviewed before the spring 1985 Board of Game meeting.

ACKNOWLEDGMENTS

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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 7.12. Juneau. 19pp.

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