

**BEHAVIOR, ECOLOGY, AND CONSERVATION
OF MOUNTAIN LIONS IN FRAGMENTED
HABITAT**

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A progress report for the 1986–1987 field season for
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INTRODUCTION

Lions in the western United States are facing increasing pressures due to increased human activity and fragmentation of their habitat. In 1985, field work began on a long term study of the behavior, ecology, and conservation of mountain lions in fragmented habitat in southcentral Idaho and northwest Utah. Lions in the study area live in small mountain ranges which are easily accessible to humans and fragmented by valleys with ranches, cattle, and roads. Data from the study population will be helpful in maintaining lions in this and similar areas in the west. This report summarizes research efforts during the second (1986-87) field season.

METHODS

The major effort in the winter was centered on capturing and radio-collaring lions in the 125 square mile (320 km²) study area. Success of capturing efforts is dependent on snow conditions. Deep snows cause deer, the lions' main food source, to congregate on their winter ranges. Our lion searches are concentrated in these areas. Lion presence is detected by traversing roads and looking for fresh tracks in snow. Once tracks are found, specially trained dogs are released to track and eventually "tree" the lion.

Snow conditions in the study area during the winter of 1986-87 were unfavorable. Little snow fell and generally remained on the ground for only a few hours. Finding fresh lion tracks was difficult, in part because deer did not concentrate on traditional winter ranges. Therefore the lions

remained widely spread out over the entire study area. We did capture an 18 month old female (75 lb, 33.7 kg) on 7 January 1987. A radio collar was attached and she was released within 2 hours once the tranquilizer drug wore off.

During the remaining winter months, she was relocated at least once weekly. Starting in June through the first week of August, our field effort increased and she was located hourly during several detailed monitoring sessions.

RESULTS

During January, February and March of 1987, the collared lion remained within 4 square miles (10 km^2) on the south side of Mount Independence (Fig. 1). On the first of April, she was found toward the south edge of her range, close to where she was captured. She remained there until at least April 10. She then moved north to the north side of Mount Independence on the 24th of April. By the 30th, she had moved back to the southern half of her home range. In early May, she had moved to the "Castles" but by the middle of May, she moved back to the north side of Mount Independence.

She stayed in there until early June. On June 4th, she was relocated hourly from late afternoon to late morning on the 5th. During that time, she moved only once in the early evening from the initial place we found her up slope approximately a mile (1.6 km). She stayed there the remainder of the night and following morning. The radio signal would alternately be strong, temporarily disappear, and then reappear at the same location. This pattern indicated that while she remained in one location,

she shifted positions in and out of the rocks. We relocated her next in mid June and she had moved back down to the southern part of her range.

Table 1. Summary of data for 18 month old female mountain lion

Date Captured	1/7/87
Date Last Relocated	8/2/87
Total Number of daily relocations	31
Estimated Home Range Size (minimum area method)	28.9 mi ² (74.8 km ²)
Maximum distance moved in a month (April)	20.3 mi (32.4 km)

Intensive monitoring in July, indicated that she remained in the same general location and showed a pattern of little movement during the night except for shifting short distances in and out of the rock outcrops. Sometime between July 14th and 23th, she crossed the valley to the south and spent the rest of July and the first week of August back on the small mountain where she was initially captured.

DISCUSSION

Beyond perfecting field techniques, this last year's field work gave us invaluable data on how an 18 month old female lion used her home range from January thru July. The 1987 work demonstrated that intensive monitoring of a lion's movements is readily possible in the study area

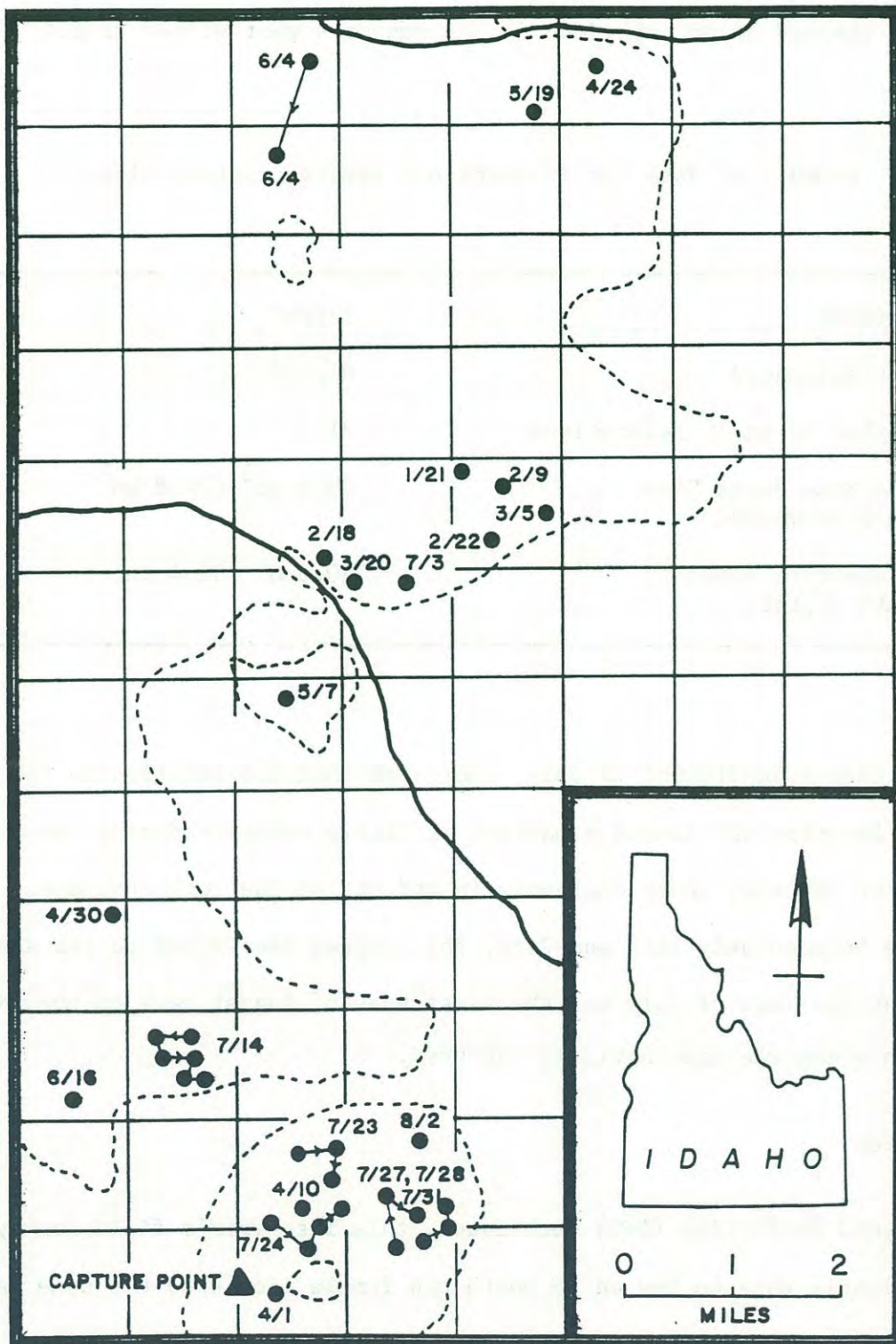


Figure 1. Map of radio relocations for 18 month old female lion. Single points represent daytime point locations. Points connected by lines represent movements made by the lion during intensive monitoring sessions.

without expensive tracking by aircraft. Such data have yet to be collected for mountain lions but are necessary for developing conservation management policies.

Winter seems to be a time of short range (less than a mile) movements. Most time was spent in an area where a small herd of mule deer (about 100 individuals) wintered. Spring was characterized by major movements (up to 7 miles) to different parts of her home range. The reason for her movements is unclear at this time. In late summer, the lion became sedentary again, concentrating her time in two areas. Collection of this type of data on more animals and for several years should provide us with detailed information on mountain lion behavior and ecology in fragmented habitat. This information will provide the basis for sound conservation management of the lions in the study area as well as of lions in similar fragmented habitat in the west.

FUTURE RESEARCH PLANS AND EXPECTED RESULTS

In the winter of 1987-88, as snow conditions permit, we plan on a major capture effort, capturing up to 5+ lions. With many animals collared, we will be able to reliably assess spatial arrangement of individual lions relative to each other, wintering deer herds, and habitat features. We will also locate deer killed by radio collared lions. Ecological information on where and how the lions were successful and condition of the deer killed will provide key information on lion-deer interactions.

During the summer of 1988, we plan on instituting a similar intensive monitoring schedule as used on the single lion this past summer. By the

end of next summer, we should have data similar to that in this report for all the animals collared. Similar data on 5+ animals will represent a major step toward our research and conservation goals.

Work plans for future years will be closely patterned after 1988. Winters will be spent capturing additional animals and recapturing collared animals as needed to replace collars and collecting data on predator-prey interactions. Summers will involve intensive 24-hour monitoring of collared animals activities.

Success of our field effort in future years depends on continued financial support. With support, we are confident that in the next 4-5 years, we will develop an understanding of mountain lion ecology and behavior that is currently lacking. Such an understanding is necessary for the conservation of mountain lions in fragmented habitat in the west. Our data will help wildlife biologists to develop sound conservation management programs which will insure the existence of this magnificent species not only in Idaho and Utah but in all of the western states.

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ITEMIZATION OF FUNDS OR IN-KIND SERVICES PROVIDED UP TO 1987

Funding Source	Amount	Use of funds
Idaho State University	\$3,500	Feasibility grant, supplies (snowshoes, camera, scales, etc.)
Chicago Zoological Society	\$2,425	Per diem, travel, and subsistence
Eppley Foundation	\$10,000	Travel, Subsistence, radio collars
Merril G. & Emta E. Hastings Foundation	\$1,000	Travel and Subsistence

In-kind services	Value (approximate)	type of service
Northern Rockies Conservation Coop.	\$8,500	4X4 truck, radio receivers transmitters, antennae, supplies.
Idaho Fish and Game Department	\$3,500	Trailer for field base
Private lion hunters	\$15,000	Trucks, dogs, horses, services (\$2,000/wk)
Volunteer field help [*]	\$3,500	Data collection

*Expenses and travel of volunteers paid by Eppley Foundation, Chicago Zoological Society, and Merrill G. & Emta E. Hasting Foundation.

NORTHERN ROCKIES CONSERVATION COOPERATIVE is a nonprofit corporation whose goal is creative, cooperative, practical problem-solving in the conservation of nature. Although its focus is on species and ecosystems in the northern Rocky Mountains, it seeks exemplary projects with national and international significance. The work of the Cooperative is basic and applied ecological research; educational activities; organization and management development, research, and consulting; and policy research and analysis. It conducts active independent programs in these four areas and offers these services to existing agencies and conservation and business organizations. NRCC's staff, board, and associates present and publish papers on a wide variety of topics. These are reprinted and distributed in this series.

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