

POPULATION ORGANIZATIONAL SYSTEMS AND REGULATORY
MECHANISMS OF A FOREST CARNIVORE (PINE MARTENS)
IN GRAND TETON NATIONAL PARK

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Study Objectives

The research is aimed at determining the role of animal behavior and environmental factors in regulating marten populations and social organization. The technique of systems analysis allows a model of the marten behavioral-ecological system (Fig. 1) to be subdivided into individual components that can be examined in detail and later combined into a whole-system model. Specific hypotheses this model generated and methods of evaluation were presented by Clark (1977). At the least, this approach helps identify important elements of the system and factors requiring further research (Stromberg and Clark 1977).

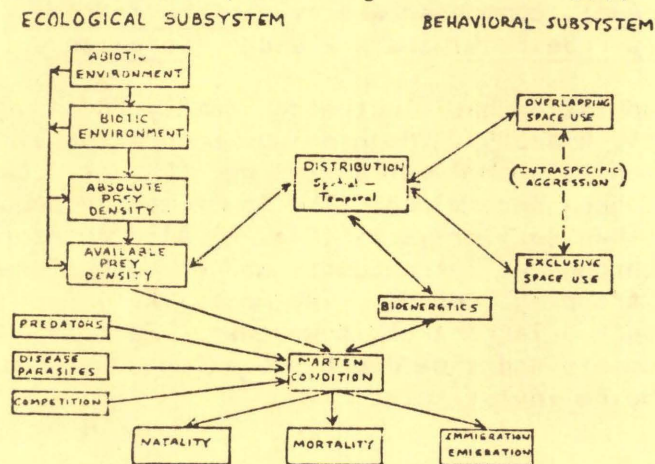


Figure 1. A schematic model of the pine marten behavioral-ecological system.

Methods

Marten home range, movements, activity patterns and population composition are being determined by intensive live-trapping supplemented by radio telemetry.

Forested areas were classified into habitat types (Daubenmire and Daubenmire 1968) according to Steel et al. (1977).

Study Area

The 9.6 km² study area is in Grand Teton National Park on a large forested bench at the base of the east slope of the Teton Range between the White Grass Ranch and Beaver Creek. Elevation is about 2200 m. Annual temperatures average 2.4 C (monthly range from -9.9 C to 15.7 C), with snow accounting for 70% of the annual precipitation of 61.5 cm (1950-1975 data).

Results and Discussion

Eight male and 6 female marten were captured. One litter of two males was raised on the study area. Home range of an adult male and adult female are given in Figures 2 and 3.

The area is largely a Abla/Cage Habitat Type, Vaccinium scoparium Phase that is complexly mixed with smaller areas of Abla/Vagl and Abla/Caru Habitat Types. Subalpine fir (Abies lasiocarpa) is the climax tree, but seral lodgepole pine (Pinus contorta) dominates the overstory. Understory dominants are grouse whortleberry (Vaccinium scoparium), tall huckleberry (V. membranaceum), common snowberry (Symphoricarpos albus), pine grass (Calamagrostis rubescens) and elk sedge (Carex geyeri).

The marten population has fluctuated monthly and annually between 1975 and 1978 (Figs. 4 and 5). Mean annual population size between 1975 and 1978 was 5.3 animals or 1 marten/293 ha (733 ac). Causes for the fluctuation have not been determined. The lower marten population on the study area in 1978 than earlier years (Fig. 4) also characterized marten populations throughout Teton County and on both sides of the Teton Range based on fur trapping records. The most likely factor that could influence marten over such a large area is weather. Factors such as moisture during preceding summers and snow depth, duration and conditions may be important and are being investigated.

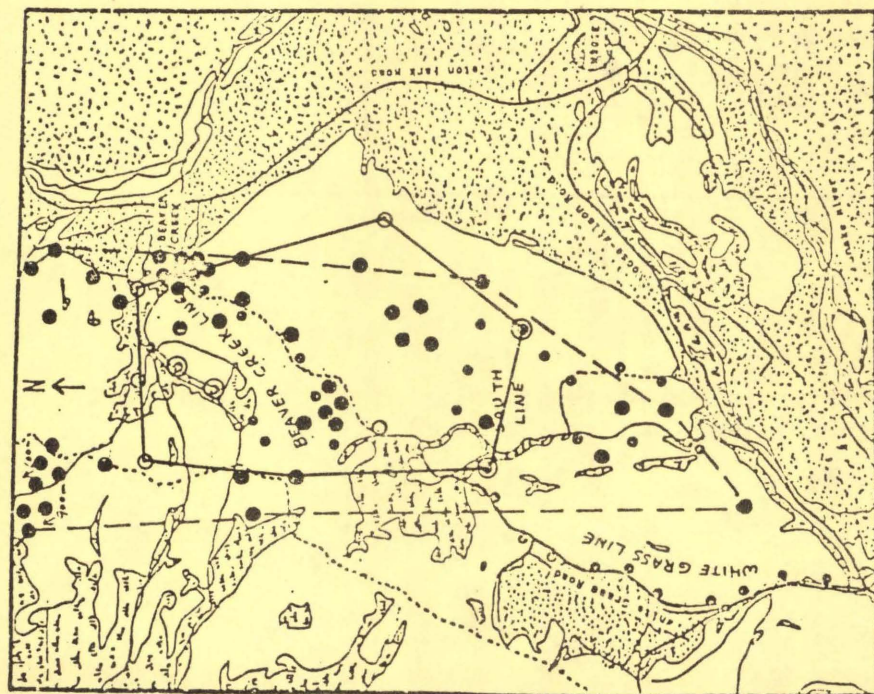


Figure 2. Location of adult male #100 from 1 Nov. 1977-31 Oct. 1978. Live-trap sites (open circles connected by solid line) and Telemetry (solid circles and dash line). Small circles are trap sites.

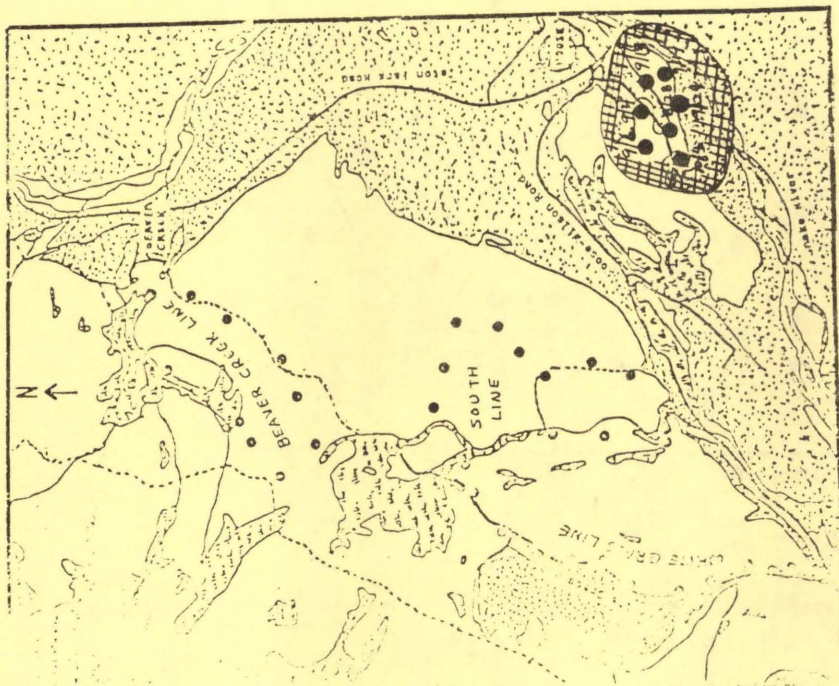


Figure 3. Location of adult female #33 from 16 Apr.-4 Oct. 1978. Live-trap sites (open circles connected by solid line) and Telemetry (solid circles and dash line). Small circles are trap sites.

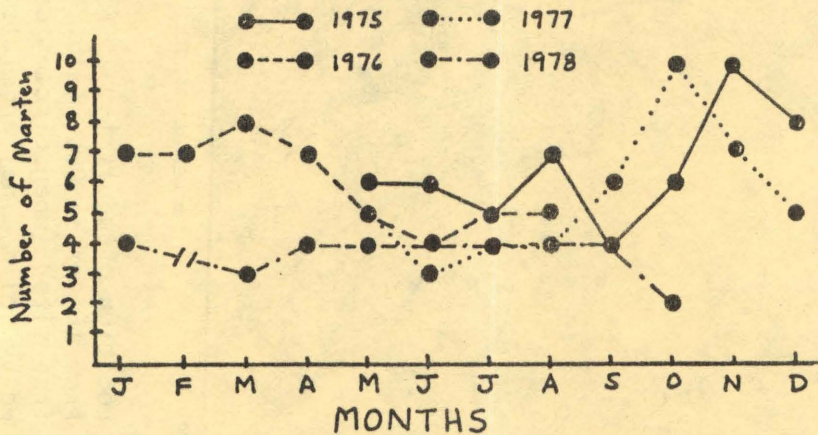


Figure 4. Monthly minimum marten population on the Grand Teton National Park, Wyoming study area.

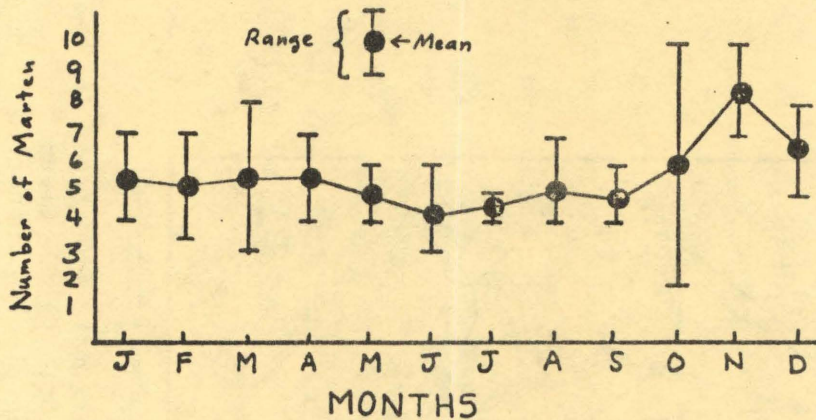


Figure 5. Mean monthly minimum marten population on the Grand Teton National Park, Wyoming study area, 1975-1978

Literature Cited

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