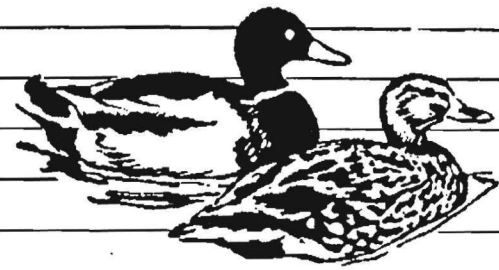
Research
Information bulletin
U.S. DEPARTMENT OF THE INTERIOR
NATIONAL BIOLOGICAL SURVEY



Number 77
1994

The Fisher: Old-growth Specialist Or Northern-forest Generalist?

In 1990, environmentalists petitioned the U.S. Fish and Wildlife Service to list the Pacific fisher (*Martes pennanti pacifica*) as endangered in California, Oregon, and Washington. The petition argued that fishers require old-growth forests, and the amount of old-growth had been reduced to the extent that the Pacific fisher was approaching extinction. The Service denied the petition, in part because the rangewide data on the habitats used by fishers were contradictory.

Do Fishers Require Old-growth Forests?

Personnel of the Maine Cooperative Fish and Wildlife Research Unit, with support from the Maine Department of Inland Fisheries and Wildlife (MDIFW), conducted the largest telemetry study of habitat use by fishers (n = 76) to date. This study concluded that in south-central Maine optimum fisher habitat was a diversity of second-growth forest types—including a variety of upland and wetland forests—that were intermixed. In contrast with our findings that fishers in south-central Maine are forest generalists, researchers in other areas have characterized fisher habitat, especially winter habitat, as predominantly mature (i.e., Great Lakes Region) to climax (i.e., Pacific Northwest) coniferous forests, with some biologists considering the fisher an old-growth specialist.

If fishers require older, closed-canopy forests, present trends in forest management toward shorter rotations to harvest are counter to the needs of the species. To conserve a species unique to North America, and to resolve a conflict with forest harvest schedules across the species' extensive range, the critical question is as follows: Do fishers in the Northeast merely use different habitat than in the Northwest or are other factors at play?

Snow as a Habitat Component

Literature on the ecology of fishers suggests that deep snow is stressful to the species and

affects gait, habitat use, and, by extension, fitness. Thus, the Maine Unit and MDIFW recently examined the distribution of fishers in Maine to assess the reasonableness of the idea that densities of fishers would be lowest in areas of greatest snowfall. We also examined the distribution of martens (*M. americana*). Mean densities of harvests of both species, by townships, were plotted (fishers = 15,549, martens = 40,516) and compared to each other, and to the mean amounts and frequencies of snowfall, 1980–87. This period was chosen because pelt prices for the two species were very high and relatively stable, suggesting that mean densities of harvests during this period were little affected by variation in trapping effort, thereby representing the relative distributions of both *Martes* species.

Distributions of Fishers, Snow, and Martens

Martens were most abundant in northern Maine and were associated with frequent ($\bar{X}$ = 6.5 per winter month) and deep ($\bar{X} \geq 48$ cm per winter month) snowfalls, whereas fishers were most abundant in southern Maine and were associated with less snow ($\bar{X} < 48$ cm per month). In addition to the amount of snow limiting fishers, dense populations of fishers may limit marten populations as evidenced by the lack of martens in southern Maine (although other factors may also be involved). These two hypotheses (i.e., snow limits fishers and fishers limit martens) were evaluated by examining age ratios of harvested fishers (n = 2,706) and martens (n = 5,572) in core habitats of Maine where one or the other species predominated between 1980 and 1984. Low fisher recruitment ($P < 0.001$) in the marten's core habitat was consistent with the hypothesis that deep and frequent snows limit fishers. Few adult martens ($P < 0.001$) in the fisher's core habitat was consistent with the hypothesis that fishers reduce survival of martens.

Data Limitations and Management Implications

The hypothesis that deep, soft snows affect the fitness and hence population levels of fishers needs direct testing because association does not prove causation, and harvest densities may not reflect population levels. However, the fact that statewide trapping for fishers was high each year of the study, and the documentation that snow affects habitat use and gaits of fishers, suggest that the distributional patterns observed between fishers and snowfall reflect a real biological relation.

Closed canopy coniferous forests seem to be a key component of fisher habitat in areas of frequent, deep snowfalls. Fragmentation of forests, although not directly studied, probably also reduces habitat suitability for fishers because of the animal's large territorial requirements (south-central Maine: 31 km^2 and 16 km^2 for adult males and adult females, respectively) and infrequent crossing of unforested areas. Removal of closed-canopy forests combined with forest fragmentation in regions with frequent, deep snowfalls may be especially detrimental to fishers. Thus, I argue that additional studies are needed in deep-snow environments to directly test the importance to fishers of closed canopy coniferous forests and forest fragmentation. Without these new data, however, we should follow a conservative approach to management and assume that closed-canopy coniferous forests, with a high degree of connectedness, are required by fishers in deep-snow environments.

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