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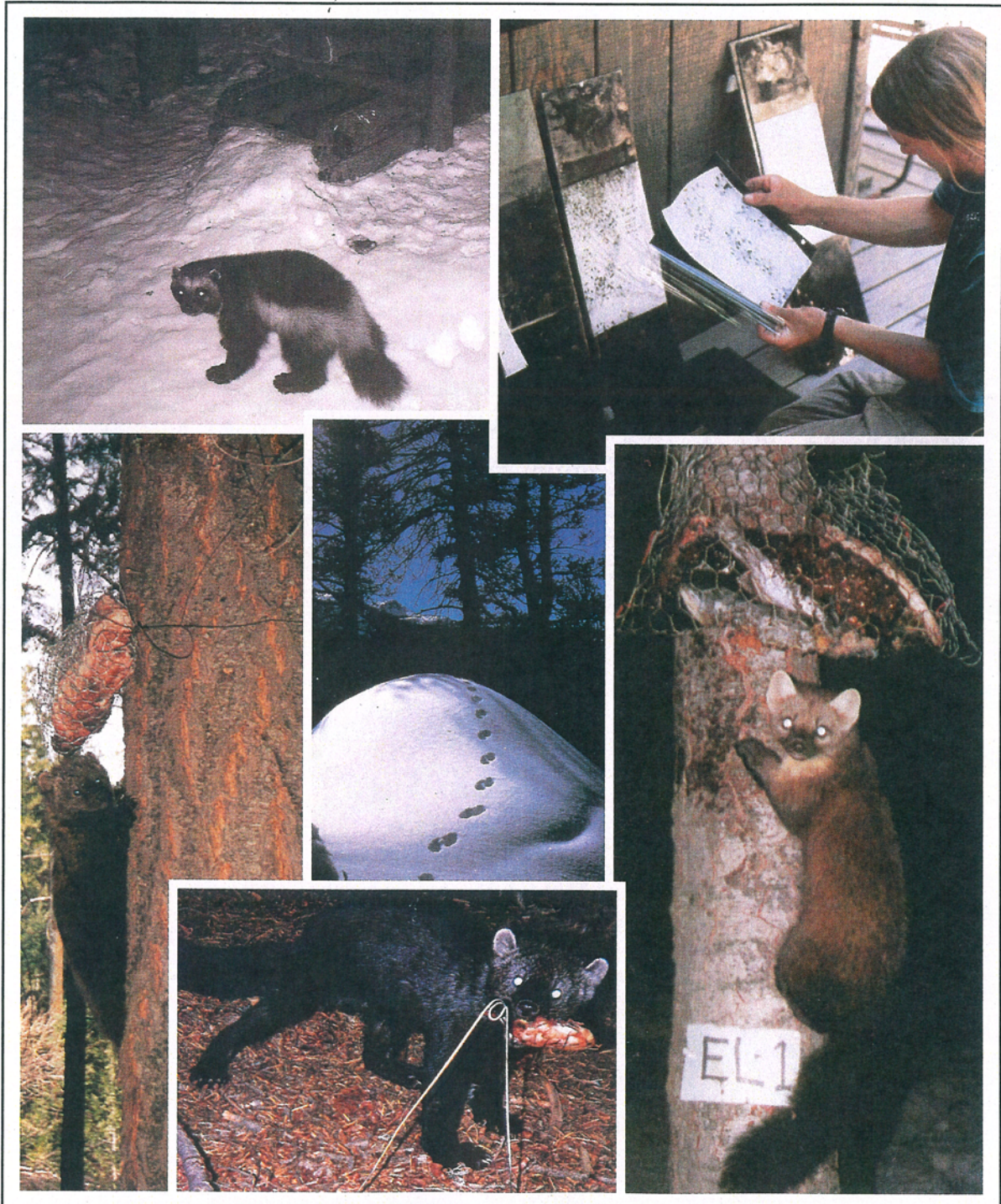
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PSW-GTR-157



American Marten, Fisher, Lynx, and Wolverine: Survey Methods for Their Detection



William J. Zielinski Thomas E. Kucera



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Abstract

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The status of the American marten (*Martes americana*), fisher (*Martes pennanti*), lynx (*Lynx canadensis*), and wolverine (*Gulo gulo*) is of increasing concern to managers and conservationists in much of the western United States. Because these species are protected throughout much of their range in the west, information on population status and trends is unavailable from trapping records. This report describes methods to detect the four species using either remote photography, track plates, or snow tracking. A strategy for systematic sampling and advice on the number of devices used, their deployment, and the minimum sampling duration for each sampling unit are provided. A method for the disposition of survey data is recommended such that the collective results of multiple surveys can describe regional distribution patterns over time. The report describes survey methods for detection only but also provides some considerations for their use to monitor population change.

Retrieval Terms: furbearers, forest carnivores, survey methods, monitoring, inventory, western United States

Technical Editors

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Cover: photos by **Jeff Copeland** (upper left, wolverine); **Bill Zielinski** (upper right, technician with track plates; and bottom center, fisher with chicken and wire); **Tom Kucera** (lower right, marten on tree); **Sue Anderson** (lower left, fisher on side of tree); and **Christina Hargis** (middle center, snow tracks).

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The American marten (*Martes americana*), fisher (*Martes pennanti*), lynx (*Lynx canadensis*), and wolverine (*Gulo gulo*) are forest carnivores that are indicators of healthy forest ecosystems. Like the wolf (*Canis lupus*) and the grizzly bear (*Ursus arctos*), they are mammals that are associated with wild places. In this century the distributions of these species have contracted considerably and they no longer occur throughout much of their historic range in the western United States. Habitat loss through timber harvest and residential development, increased roading of forests, and these species' susceptibility to trapping and general sensitivity to human disturbance have been implicated in the decline of one or more of them. One of the most sensitive measures of the integrity of natural ecosystems is whether populations of tertiary consumers, like the four species considered in this publication, occur in an area and can be sustained there. Therefore, assessing the presence of these species is an essential part of determining the health of forest ecosystems.

Recently, petitions have been submitted to list three of these four species as threatened or endangered in the western United States, under the Federal Endangered Species Act. Various State and Federal agencies have designated them as "management indicator," "sensitive," and "species of special concern." In addition, increased public awareness of the ecological roles of lynx, wolverines, fishers, and martens has highlighted the need to understand their ecology and biogeography. The presence of these animals has been difficult to verify where they are not commercially harvested. Until recently most of the information about their presence came from commercial trapping records and compilations of sightings. However, since the mid-1980's a number of non-lethal detection methods have been developed (or refined) that reliably detect the presence of each of these uncommon species. Unlike data from sporadic, unverified sightings, these methods produce evidence that can be independently corroborated by specialists. We recommend and describe the use of three methods: photographic bait stations, track-plate stations, and snow tracking. We provide protocols for the use of each method. These protocols enable local biologists to choose among these methods, based on their objectives, funding, personnel, previous experience, and the reliability of snowfall. A minimum amount of effort is recommended for each method. We assume this effort is equivalent among methods and is sufficient to determine the presence of target species in a survey area during the survey period. In addition, we suggest a method for allocating survey effort across large geographic areas so that results can be aggregated into general maps of each species' distribution in an area of interest. Although we do not describe methods for monitoring the status or trend in population abundance, we provide background for those who would attempt to do so using the detection methods described here.

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