

National Forest and BLM lands for the long term.

As a result of Federal, State, and Tribal regulations and plans that conserve lynx, the threats to lynx from the inadequacy of existing regulatory mechanisms have been reduced. However, until Federal land management plans are amended to address lynx, we conclude that the threat to lynx because of the inadequacy of existing regulatory mechanisms continues to be moderate, albeit at a lower level than that described in the final rule.

Factor E. Other Natural or Manmade Factors Affecting Its Continued Existence

Since the lynx was listed, our understanding of the vital role immigration of lynx from Canada plays in sustaining lynx in the contiguous United States has improved (Ray *et al.* 2002, Schwartz *et al.* 2002). In the final rule, we explained that connectivity of appropriate habitat types and cover provide travel corridors between habitat patches, thereby increasing the likelihood of successful lynx dispersal. It is essential that landscape connectivity between lynx habitats and populations in Canada and the contiguous United States be maintained. The final rule described the reduced ability for lynx from northern populations in Canada to cross the St. Lawrence River in southern Quebec and the St. Mary's River between Ontario and Michigan. At this time, we know of no natural or human-caused barriers that effectively prohibit movement of lynx between Canada and the directly adjacent regions of the contiguous United States (Northeast, Great Lakes, and Northern Rocky Mountains/Cascades) that support lynx habitats and populations. The threat to lynx because of the lack of a cohesive international strategy to maintain connectivity between habitats in Canada and the United States is low.

The final rule also noted that for most areas of the contiguous United States, we have no evidence that human-caused changes have significantly reduced the ability of lynx to disperse or have resulted in the loss of genetic interchange. The final rule explained that high traffic volume on roads that bisect suitable lynx habitat and associated suburban developments (such as from ski area expansion) may inhibit lynx movement and dispersal and may contribute to loss of habitat connectivity. Such situations occur in the Southern Rocky Mountains Region connecting cities, towns, and ski areas. The final rule explained that roads do

not appear to be a significant direct cause of mortality of resident lynx, but that the majority of records of lynx mortalities from vehicle accidents are of recently translocated animals. No information currently exists to determine the level at which traffic volume or roadway design may influence or create an impediment to lynx movements. In local areas, lynx may be negatively influenced by high traffic volume on roads that bisect suitable lynx habitat and associated suburban developments that contribute to loss of habitat connectivity; however, we conclude the overall threat to lynx populations from high traffic volume on roads that bisect suitable lynx habitat and associated suburban developments is low, although locally in Colorado the risk is higher.

Isolated, small resident lynx populations, such as may have existed in the Southern Rocky Mountains and New York, are susceptible to genetic or demographic problems or random environmental events (such as a series of years when snow conditions are poor such that lynx cannot out-compete other predators). As described in "Background" above, we surmise that immigration is necessary to augment and maintain local lynx populations, especially in transitional habitats at the southern margins of lynx range. The natural distance and isolation of the Southern Rocky Mountain region and New York from source lynx populations may have severely reduced, if not entirely precluded the immigration that was likely necessary for potential resident lynx populations in these areas to sustain themselves. This same analysis does not apply to dispersers because we consider dispersers to be transient individual animals that are not a part of a population; they contribute little to the persistence of the metapopulation unless they augment or colonize resident lynx populations. We recognize that individual lynx may be affected by random environmental events. We expect that many dispersing lynx naturally do not survive because they are unable to find adequate food resources and because of the risks naturally inherent in long-distance movements.

The final rule describes that lynx show no evidence of being displaced by or avoidance of unpaved forest roads. We find no information demonstrating that forest roads negatively impact lynx (Roe *et al.* 2001) and, therefore do not consider forest roads to be a threat to lynx.

The final rule discussed the theory that suggested that increasing ease of human access into forests increased the

vulnerability of lynx to intentional or unintentional shooting and trapping. We are concerned about the mortality of lynx through legal or illegal trapping and shooting; however, we have no information to indicate that the loss of these individuals negatively affects the overall ability of lynx populations to persist. We conclude the threat to the threat to lynx populations from incidental catch by trapping, snaring, or hunting is low (see Factor B above).

There continues to be no data on the role of competition between lynx and other species; therefore, we have only information on behavior and morphological adaptations of lynx and of potential competitors during both winter and snow-free seasons from which to gain some inferences about competition and whether it has an impact on lynx, as was thoroughly described in the final rule. Bobcats, mountain lions, and fishers are natural potential competitors or predators that coevolved with lynx. As described in the final rule, the coyote expanded its range into that of the lynx within the past century so any potential for competition between these two species may be considered unnatural. Deep snow provides lynx its competitive advantage. The final rule explained that human alteration of forests may create habitats that may be more suitable to potential lynx competitors. At this time there is no evidence that, if competition exists between lynx and any of these species, it exerts a population-level impact on lynx; therefore, we do not consider competition to be a threat to lynx.

Research scientists in the Missoula Wildlife Ecology unit of the Forest Service Rocky Mountain Research Station, in cooperation with the Northern Region of the Forest Service and the Superior National Forest in Minnesota, recently discovered evidence of hybridization between bobcats and Canada lynx. This is the first time hybridization has been reported in wild populations of these species. As a result of this finding, the Forest Service has conducted a DNA analysis of most of the lynx hair samples collected as part of the National Lynx Survey to help determine if hybridization has occurred elsewhere. So far, no additional instances of hybridization have been detected. This phenomenon may have implications for lynx conservation, but additional sampling and analysis are required before biologists will be able to fully understand the significance of the hybridization (D. Tippetts, U.S. Forest Service, in litt., 2003).