

estimated that there were 27,000 km² (10,300 mi²) of potential lynx habitat across all ownerships in this region (U.S. Forest Service and Bureau of Land Management 1999). All of this habitat is found in the mountains, which are primarily under Federal ownership (U.S. Geological Survey 1998). In the Southern Rocky Mountains region, as currently mapped there are approximately 30,000 km² (12,000 mi²) of lynx habitat on U.S. Forest Service lands and approximately 700 km² (280 mi²) on BLM lands (Table 1) (E. Johnston, in litt. 2003; J. Whitney, in litt. 2003).

Colorado—The montane and subalpine forest ecosystems in Colorado are naturally highly fragmented (Thompson 1994), which we believe has always limited the potential for lynx. Most historic records are distributed among the northern and central mountain ranges in Colorado (McKelvey *et al.* 2000, Meaney 2002). There is a great deal of inconsistency among historic lynx reports for Colorado (Meaney 2002); as a result, it is difficult to interpret historic records and we question some of the numbers reported. However, based on available information, Thompson and Halfpenny's (1989) description seems accurate: "it is unlikely lynx were ever very common and have probably existed as discontinuous, remnant populations," a conclusion that is supported by the State of Colorado (T. Blickensderfer, in litt. 2003). A total of 22 positive lynx reports exist in State records since the late 1800s (J. Mumma, Colorado Division of Wildlife, in litt. 1998); although McKelvey *et al.* (2000b) considered only 17 of these records "verified." The last verified lynx specimens were taken in 1973–1974 (Halfpenny *et al.* 1982; T. Blickensderfer, in litt. 2003); which coincided with extreme cyclic population highs that occurred throughout the west and Canada. No verified records of lynx exist since 1974; however, extensive survey efforts have resulted in periodic reports of lynx tracks (Halfpenny and Miller 1981; Thompson and Halfpenny 1989; Anderson 1990; Thompson and Halfpenny 1991; Andrews 1992; Carney 1993; Fitzgerald 1994; Colorado Division of Wildlife *et al.* 1997; T. Blickensderfer, in litt. 2003). Based on historic lynx records, we are uncertain whether Colorado supported a small resident lynx population that may have been extirpated or whether historic records were of dispersers that arrived during extremely high population cycles. If these historic records did

represent resident populations rather than solely dispersing animals that emigrated from the Northern Rocky Mountains/Cascades or Canada that were unable to sustain persistent populations, we believe a viable native resident lynx population no longer exists in Colorado. We believe the most likely cause for the loss of resident lynx populations in Colorado was a natural process because lynx in this region are isolated from source lynx populations and habitats. Immigration appears necessary to augment and maintain local lynx populations, especially in transitional habitats at the southern margins of lynx range. The distance and isolation of this region from source populations outside of the Southern Rocky Mountains severely reduced, if not entirely precluded, the immigration that was likely necessary for the lynx population of this region to sustain itself. If these historic records were of dispersers that arrived when there were extremely high population cycles, it would be inappropriate to conclude these populations were extirpated because dispersers can continue to arrive in these areas in the future.

In 1997, the Colorado Division of Wildlife in cooperation with numerous government and private entities began a program to introduce lynx from Canada and Alaska into Colorado in an effort to reestablish a resident lynx population. In 1999 and 2000, 96 lynx were released into Colorado with the intention of releasing an additional 186 lynx between 2003 and 2009 (T. Blickensderfer, in litt. 2003). It is too early to determine whether this effort will be successful (T. Blickensderfer, in litt. 2003), although reproduction has been recently documented (T. Malmsbury, in litt., 2003).

Southeastern Wyoming—Habitat in southeastern Wyoming is contiguous with that in Colorado. Records from southeastern Wyoming are scarce (Reeves 1986, McKelvey 2000b). The most recent record is from the Laramie Range in 1963, a time when the lynx population cycle was at an unprecedented high. The core of lynx range in this region was in Colorado. Because habitat in this area is naturally marginal, patchy, and less suitable for snowshoe hares (B. Wichers, in litt. 2003) and there are extremely few historic records of lynx in southeastern Wyoming with no evidence of breeding, we conclude a resident population never existed in southeast Wyoming and that reports of lynx were of dispersers.

Southern Rocky Mountains Summary—We are uncertain whether lynx in this region historically occurred as a resident population or if historic

records were of periodic dispersers. We conclude that if a resident lynx population historically occurred in the Southern Rocky Mountains, then this native population has been lost. We surmise the primary cause for the loss of this population was its natural isolation from potential source populations. Although habitats in the Southern Rockies are far from source populations and more isolated, it is still possible that dispersers could arrive in the Southern Rocky Mountains during extreme highs in the population cycle. It remains to be seen if the State of Colorado's reintroduction program will reestablish a resident lynx population.

Habitat-Related Threats Analysis

The final rule discussed the factors affecting lynx habitat, which included human alteration of the distribution and abundance, species composition, successional stages, and connectivity of forests, and the resulting changes in the forest's capacity to sustain lynx populations. The final rule noted that two important human influences on snowshoe hare habitat are timber harvest and fire suppression; however, the final rule acknowledged that information about how lynx populations respond to these specific impacts is limited. Studies of lynx and snowshoe hare have documented lynx presence and reproduction and snowshoe hare abundance in a variety of managed landscapes (Apps 2000; Squires and Laurion 2000; Squires and Ruggiero 2001; Stinson 2001; Homyack 2003; Maine Department of Inland Fisheries and Wildlife 2003; Minnesota Department of Natural Resources, in litt. 2003; G. Matula, in litt. 2003; Mills and Griffin, in litt. 2003).

In the final rule we cited calculations of the extent of lynx habitat encompassed in certain regions, land ownerships, and land management designations. These calculations were provided to us in a biological assessment (U.S. Forest Service and Bureau of Land Management 1999). Because these calculations were based on coarse mapping of vegetation types, they overestimated the amount of lynx habitat in many areas (particularly in the Great Lakes, as described above) and possibly underestimated it in other areas, but they nonetheless provided a perspective on the amount of lynx habitat overall and the proportions in various ownerships and land management designations. Since the final rule, lynx habitat has been mapped on Federal lands in order to conduct analyses under section 7 of the Act. As a result, estimates of the amount of lynx habitat on some Federal lands are more