

17 litters with 37 kittens, documented in the 300-km<sup>2</sup> (100-mi<sup>2</sup>) study area (Maine Department of Inland Fisheries and Wildlife 2003; G. Matula, in litt. 2003), demonstrating the current existence of a resident population.

Lynx habitat in Maine is considered to be of high quality at this time. The quantity of boreal forest that can potentially support lynx in Maine has not changed substantially in the past 100 years (G. Matula, in litt. 2003). Extensive clear cutting to salvage diseased trees in the 1970s and 1980s resulted in large amounts of the forest presently in a stage of regeneration that is optimal for snowshoe hares (Hoving 2001; Homyack 2003; Krohn 2003; G. Matula, in litt. 2003). Snowshoe hare densities are high (1.6–2.4 hares per hectare (ha) (4.0–5.9 per acre (ac))) in these regenerating stands (Homyack 2003; G. Matula, in litt. 2003). As a result, lynx numbers have increased in response to improved habitat conditions and increased snowshoe hare populations. In a 300-km<sup>2</sup> (100-mi<sup>2</sup>) study area in northern Maine, the preliminary estimate of lynx density in fall 2002 was 4.4 lynx per 100 km<sup>2</sup> (11.4 per 100 mi<sup>2</sup>) (G. Matula, in litt. 2003). Based on preliminary analyses, lynx home ranges in this study area average 52 km<sup>2</sup> (20 mi<sup>2</sup>) for females and 70 km<sup>2</sup> (27 mi<sup>2</sup>) for males (G. Matula, in litt. 2003); these relatively small home ranges are likely an indication of high habitat quality with abundant snowshoe hares. Coincidentally, these optimal habitat conditions occur during a period when hares and lynx should be at a cyclic high, although evidence of hare population cycles are less clear in this region. Maine's lynx numbers are expected to fluctuate in concert with hare population fluctuations.

**New Hampshire**—Although habitat in New Hampshire is contiguous with that in Maine, the amount of current or historical lynx habitat in New Hampshire is much less than in Maine. Recent modeling predicted approximately 1,000 km<sup>2</sup> (400 mi<sup>2</sup>) (Hoving 2001; C. Hoving, pers. comm. 2003). Most of the lynx records are from harvest that occurred in the 1930s, ranging from 1 to 20 per year (Brocke *et al.* 1993, McKelvey *et al.* 2000b). Between 1940 and 1964, lynx harvests were lower, ranging from 0 to 3 lynx trapped per year. For 11 of these 24 years, the harvest was zero (McKelvey *et al.* 2000b). The trapping season was closed in 1964 in response to apparent declines in lynx abundance reflected in harvest returns (Siegler 1971; Silver 1974; Litvaitis *et al.* 1991). Since the 1960s, reports of lynx in New Hampshire have been rare; only two

reports exist from the 1990s (M. Amaral, U.S. Fish and Wildlife Service, in litt. 1999). Although there are no records of lynx breeding in New Hampshire, based on regular harvest reports from the past and connectivity with habitats in Maine where resident lynx occur, we believe that a small resident lynx population historically occurred in New Hampshire but no longer exists. However, dispersers likely still occur in New Hampshire because of its connectivity with Maine; lynx have recently been documented in Maine near the New Hampshire border (M. McCollough, pers. comm. 2003).

**Vermont**—Little boreal forest exists currently or historically in Vermont and what habitat exists is isolated from that in New Hampshire (W. Laroche, Vermont Department of Fish and Wildlife, in litt. 2003). Only four verified records of lynx exist for Vermont (McKelvey *et al.* 2000b; W. Laroche, in litt. 2003). There is no evidence lynx reproduction ever occurred in Vermont. In the Green Mountain National Forest, all potential lynx habitat occurs in small patches that are not large enough to support a lynx; bobcats are present throughout these areas (P. Brewster, Green Mountain and Finger Lakes National Forests, in litt. 2000), evidence that these areas are not suitable for lynx. Hoving's (2001) model predicts only approximately 11 km<sup>2</sup> (4 mi<sup>2</sup>) of potential lynx habitat in Vermont (C. Hoving, pers. comm. 2003). Based upon the limited amount and dispersed nature of suitable habitat, we conclude lynx have occurred in Vermont as dispersers that have never established resident populations. It is still possible for lynx to disperse to Vermont.

**New York**—An "island" of boreal forest exists both historically and currently in the Adirondack Mountains of New York. A resident lynx population reportedly occurred in the northern region of New York, particularly in the Adirondack Mountains, but it was considered extirpated by 1900 (Brocke 1982, McKelvey *et al.* 2000b). However, there are 23 verified lynx occurrences since 1900, primarily from the Adirondack Mountains (McKelvey *et al.* 2000b). The most recent verified record was from 1973 (McKelvey *et al.* 2000b), which correlates to an extreme cyclic population high. Habitat and prey conditions were deemed suitable for a lynx reintroduction in 1989–1991 (Brocke 1982). The reintroduction was unsuccessful in establishing a population. Hoving's 2001 model predicted approximately 190 km<sup>2</sup> (73 mi<sup>2</sup>) of potential lynx habitat in New

York (C. Hoving, pers. comm. 2003), an area only slightly larger than the average home range of a single male lynx. The boreal forest in New York is protected as Adirondack State Park and much of the forest is mature without the understory necessary to support a snowshoe hare population capable of sustaining lynx (G. Batcheller, New York State Division of Fish, Wildlife and Marine Resources, pers. comm. 2003). It appears habitat quality is marginal. We conclude that a resident population may have existed in New York prior to 1900; however, records of lynx since 1900 are of dispersers.

**Northeast Summary**—As it did historically, the boreal forest of the Northeast continues to exist primarily in Maine where habitat is currently optimal and a resident, breeding population of lynx continues to exist. Maine's lynx population is currently much larger than we knew at the time of the final rule in 2000 and habitat is directly connected to substantive lynx populations and habitat in southeastern Quebec and New Brunswick. The potential exists for lynx to occur in New Hampshire because of its direct connectivity with Maine and we presume they currently occur there. Lynx in Vermont have always existed solely as dispersers. Lynx occurring in New York since 1900 have been dispersers.

#### Great Lakes

At the time of the final listing rule for lynx, the coarse-scale vegetation description, "mixed deciduous-coniferous forest" was used to characterize potential lynx habitat in the Great Lakes Region because it encompassed 88 percent of lynx occurrence records in this region (McKelvey *et al.* 2000b). As mapped (Bailey 1998, McKelvey *et al.* 2000b), the mixed deciduous-coniferous forest covers an extensive area in the western Great Lakes region, primarily in northeastern Minnesota, northern Wisconsin, and the western portion of Michigan's upper peninsula, giving the appearance of a large expanse of continuous boreal forest and creating the expectation of resident lynx populations throughout this large area.

However, this broad vegetation description encompasses large areas that are not lynx habitat, particularly in Wisconsin (Wisconsin Department Natural Resources, in litt. 2003). As can be seen in maps of Early Settlement Vegetation, historically spruce and fir (the predominant type of trees in the boreal forest) were most abundant in northeastern Minnesota, which is contiguous with boreal forest in Ontario,