

presumed extinct *C. l. mogollonensis* (which historically occurred in parts of New Mexico and Arizona) to define the portions of Arizona, New Mexico, Texas, and Mexico where recovery of the Mexican wolf would be appropriate.

#### *J. Recovery Progress of the Eastern Gray Wolf*

The 1992 revised Eastern Plan has two delisting criteria. The first criterion states that the survival of the wolf in Minnesota must be assured. We, and the Eastern Timber Wolf Recovery Team (Rolf Peterson, Eastern Timber Wolf Recovery Team, *in litt.* 1997, 1998, 1999a, 1999b), believe that this first delisting criterion remains valid. It identifies a need for reasonable assurances that future State and tribal wolf management practices and protection will maintain a viable recovered population of gray wolves within the borders of Minnesota for the foreseeable future. While there is no specific numerical recovery criterion for the Minnesota wolf population, the Eastern Plan identified State subgoals for use by land managers and planners. The Eastern Plan's subgoal for Minnesota is 1,251 to 1,400 wolves.

The second delisting criterion in the Eastern Plan states that at least one viable wolf population should be reestablished within the historical range of the eastern timber wolf outside of Minnesota and Isle Royale, Michigan. The Eastern Plan provides two options for reestablishing this second viable wolf population. If it is located more than 100 miles from the Minnesota wolf population, it would be considered "isolated," and the frequency of movement of individuals and genetic material from one population to the other would likely be low or nonexistent. Such an isolated population, in order to be self-sustaining, should consist of at least 200 wolves for at least 5 years (based upon late winter population estimates) to be considered viable. Alternatively, if the second population is located within 100 miles of a self-sustaining wolf population (for example, the Minnesota wolf population), a reestablished population having a minimum of 100 wolves for at least 5 years would be considered viable. Such a smaller population would be considered to be viable, because its proximity would allow frequent immigration of Minnesota wolves to supplement it numerically and genetically.

The Eastern Plan does not specify where in the eastern United States the second population should be reestablished. Therefore, the second population could be located anywhere

within the triangular Minnesota-Maine-Florida land area covered by the Eastern plan, except on Isle Royale, Michigan and within Minnesota. While the 1978 Eastern Plan identified potential gray wolf restoration areas throughout the eastern States, extending as far south as the Great Smoky Mountains and adjacent areas in Tennessee, North Carolina, and Georgia, the revised 1992 Eastern Plan dropped from consideration the more southern potential restoration areas, because recovery efforts for the red wolf were being initiated in those areas (Service 1978, 1992a).

The 1992 Eastern Plan recommends reclassifying wolves in Wisconsin and Michigan from endangered to threatened status separately, recognizing that progress towards recovery may occur at differing rates in these two States. The Plan specifies that wolves in Wisconsin could be reclassified to threatened if the population within the State remained at or above 80 wolves (late winter estimates) for 3 consecutive years. The Plan does not contain a reclassification criterion for Michigan wolves. Instead, it states that if Wisconsin wolves reached their reclassification criterion, consideration should also be given to reclassifying Michigan wolves. However, with the subsequent increase in Michigan wolf numbers, it has frequently, but unofficially, been assumed that the "80 wolves for 3 years" criterion also would be applied to Michigan. In other words, each State could be considered for reclassification if its wolf population reached 80 individuals or more for 3 successive years. The Eastern Timber Wolf Recovery Team used these criteria in its recommendation that the gray wolf in the western Great Lakes States be reclassified to threatened as soon as possible (Peterson *in litt.* 1997, 1998, 1999a, 1999b).

The Eastern Timber Wolf Recovery Team clarified the second population delisting criterion, which considers the wolves in northern Wisconsin and the adjacent Upper Peninsula of Michigan to be a single population. The Recovery Team stated that the numerical delisting criterion for the Wisconsin-Michigan population will be achieved when 6 successive late winter wolf surveys document that the population equaled or exceeded 100 wolves (excluding Isle Royale wolves) for 5 consecutive years (Rolf Peterson, *in litt.* 1998). Because the Wisconsin-Michigan wolf population was first known to have exceeded 100 wolves in the late winter 1993–94 survey, the numerical delisting criterion was satisfied in early 1999, based upon

late winter 1998–99 data (Beyer *et al.* 2001, Wydeven *et al.* 1999).

The Eastern Plan has no goals or criteria for the gray wolf population on the 546-sq km (210-sq mi) Isle Royale, Michigan. This small and isolated wolf population is not expected to make a significant numerical contribution to gray wolf recovery, although long-term research on this wolf population has added a great deal to our knowledge of the species.

Over the last several years, the Eastern Timber Wolf Recovery Team has consistently recommended that we designate a DPS in the western Great Lakes area and proceed with reclassification of wolves in that DPS to threatened status as soon as possible. The Eastern Team recommended that the DPS include a wide buffer around the existing populations of wolves in Minnesota, Wisconsin, and Michigan. This buffer was described as lands that may not be regularly occupied by wolves but which may be temporarily used by dispersing wolves. Thus, the Eastern Team suggested the DPS also include the States of North Dakota, South Dakota, Iowa, Illinois, Indiana, and Ohio (Peterson *in litt.* 1997, 1998, 1999a, 1999b).

#### Minnesota

During the pre-1965 period of wolf bounties and legal public trapping, wolves persisted in the more remote northeastern areas of Minnesota. Estimates of population levels of Minnesota wolves prior to listing under the Act in 1974 include 450 to 700 in 1950–53 (Fuller *et al.* 1992, Stenlund 1955), 350 to 700 in 1963 (Cahalane 1964), 750 in 1970 (Leirfallom 1970), 736 to 950 in 1971–72 (Fuller *et al.* 1992), and 500 to 1,000 in 1973 (Mech and Rausch 1975). While these estimates were based upon varying methodologies and are not directly comparable, they all agree in estimating the wolf population in Minnesota, the only significant population in the Lower 48 States during those time-periods, at 1,000 or fewer animals preceding their listing under the Act.

Various population estimates in Minnesota have indicated increasing numbers after the wolf was listed as endangered under the Act. A population of 1,000 to 1,200 was estimated by L. David Mech for 1976 (Service 1978), and 1,235 wolves in 138 packs were estimated for the winter of 1978–79 (Berg and Kuehn 1982).

In 1988–89, the Minnesota Department of Natural Resources (MN DNR) repeated the 1978–79 survey, and also used a second method to estimate wolf numbers in the State. The resulting