

were resident in the Upper Peninsula. Approximately 40 percent of these packs had members with active radio tracking collars (Hammill pers. comm. 2002.) Care is taken to avoid double-counting wolves, and a variety of evidence is used to distinguish adjacent packs and accurately count their members (Beyer *et al.* 2001).

These annual surveys have documented the following minimum late winter estimates of wolves occurring in the Upper Peninsula from 1994 through 2001: 57 wolves in 1994, 80 in 1995, 116 in 1996, 112 in 1997, 140 in 1998, 174 in 1999, 216 in 2000, and 249 in 2001. In recent years the annual rate of increase has been about 24 percent (MI DNR 1997, 1999a, 2001). The MI DNR estimated a minimum of 278 wolves in the Upper Peninsula in late winter 2001–2002 (MI DNR 2002).

The Upper Peninsula Michigan wolf population has exceeded the unofficial criterion of 80 animals for reclassification from endangered to threatened status. Similar to the situation in Wisconsin, the Upper Peninsula wolf population by itself has surpassed the goal of 200 wolves for a second population, as specified in the Eastern Plan.

During the winter of 1997–98, one wolf pack composed of four animals lived on lands of the Keewenaw Bay Indian Community. No other wolves are known to be primarily using tribal lands in Michigan (Hammill *in litt.* 1998).

The wolf population of Isle Royale National Park, Michigan, is not considered to be an important factor in the recovery or long-term survival of wolves in the western Great Lakes States. This population is small, varying from 12 to 29 animals over the last 15 years, and is almost completely isolated from other wolf populations (Peterson *et al.* 1998, pers. comm. 1999). For these reasons, the Eastern Plan does not include these wolves in its recovery criteria and recommends only the continuation of research and complete protection for these wolves (Service 1992a).

Although there have been reports of wolf sightings in the Lower Peninsula of Michigan, including a 1997 report of 2 large canids believed to be wolves on the ice west of the Mackinaw Bridge, there is no evidence that there are resident wolves in the Lower Peninsula. However, recognizing the likelihood that small numbers of gray wolves will eventually move into the Lower Peninsula, MI DNR has begun a revision of its Wolf Management Plan to incorporate provisions for wolf management there (see issue U, “State Wolf Management Plans”).

Northeastern United States

Wolves were extirpated from the northeastern United States by 1900. Few credible observations of wolves were reported in the Northeast during most of the 20th century. However, in 1993 a single female wolf was killed in western Maine, and in 1996 a second wolf or wolf-like canid was trapped and killed in central Maine. Another wolf-like canid was mistaken for a coyote and killed in 1997 in northern Vermont. In early 2002 a 29 kg (64 lb) apparent wolf was killed by a trapper in southeastern Quebec, 20 miles from the New Hampshire border; tissue samples are undergoing genetic analysis. These records and other observations and signs of large, unidentified canids in Maine during recent years led to speculation that wolves may be dispersing into the northeastern United States from nearby occupied habitat in Canada. Many of the characteristics of the unidentified canids are consistent with an animal intermediate between the eastern coyote and the gray wolf. Private conservation organizations, the Maine Department of Inland Fisheries and Wildlife, the New York Department of Environmental Conservation, and the Service are continuing to seek evidence of the presence of wild wolves in northern New York and New England. However, at this time there is no firm evidence that a breeding population of wolves or wolf-like animals exists in the northeastern United States.

A recent Geographic Information System analysis evaluated the potential for wolf dispersal from southern Quebec and Ontario into the northeastern United States (Harrison and Chapin 1998). The study also estimated the amount of suitable wolf habitat present in northern New York and other New England States, and with Wydeven *et al.* (1998) evaluated the likelihood of natural wolf colonization from existing occupied wolf range in Canada. These studies, and Mladenoff and Sickley (1998), found that sufficient suitable wolf habitat is available in the Adirondack Park region of New York and in Maine and northern New Hampshire. However, the New York habitat is relatively isolated, and the authors concluded that natural recolonization is unlikely to occur there. Furthermore, while there are relatively narrow potential dispersal corridors connecting expansive wolf habitat in Maine and New Hampshire with existing wolf populations north of Quebec City, there are significant barriers to dispersal, including about 18 km (11 mi) of the St. Lawrence River, an adjacent four lane highway, rail lines,

and dense human developments that may preclude the movement of a sufficient number of wolves from Canada into Maine (Harrison and Chapin 1997).

In the study on the feasibility of wolf reintroduction in the Adirondacks, Paquet *et al.* (1999) found that suitable habitat for sustaining a small population of gray wolves is present, but that habitat fragmentation within the Adirondack Park and the lack of linkages to occupied wolf areas to the north suggest that wolves would not persist there without periodic human intervention. As a result, the authors conclude that the ecological conditions in the Adirondack Park dictate against a successful reintroduction of gray wolves.

Other Areas in the Eastern United States

The increasing numbers of wolves in Minnesota and the accompanying expansion of their range westward and southwestward in the State have led to an increase in dispersing, mostly young, wolves that have been documented in North and South Dakota in recent years. An examination of skull morphology of North and South Dakota wolves indicates that of eight examined, seven likely had dispersed from Minnesota; the eighth probably came from Manitoba, Canada (Licht and Fritts 1994). Genetic analysis of an additional gray wolf killed in 2001 in extreme northwestern South Dakota indicates that it, too, originated from the Minnesota-Wisconsin-Michigan wolf population (Straughan and Fain 2002). The low potential for the establishment of a viable and self-sustaining wolf population in North and South Dakota, and the belief that all or most wolves in the Dakotas are biologically part of the Minnesota-Wisconsin-Michigan wolf population, leads us to conclude that any wolves in these States should be included in the Eastern Gray Wolf DPS.

In October 2001, a wolf was killed in north-central Missouri by a farmer who believed it was a coyote. The wolf's ear tag identified it as having originated from the western portion of Michigan's Upper Peninsula, where it had been captured as a juvenile in July of 1999.

Wolves like these and others described below in the Western DPS are expected to continue to disperse from the core recovery populations and move into areas where wolf numbers are extremely low or nonexistent. Unless they return to a core recovery population and join or start a pack there, they are unlikely to contribute to wolf recovery. While it is possible for them to disperse and encounter another wolf, mate, and even reproduce,