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## First Confirmed Occurrence of a Wolf, *Canis lupus*, South of the St. Lawrence River in Over 100 Years

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A large canid was snared near Sainte-Marguerite-de-Lingwick, Québec, in January 2002. DNA analysis confirmed the animal to be a Wolf (*Canis lupus*). Wolves were extirpated from this region around 1850-1900 and this is the first confirmed observation since then.

**Key Words:** Wolf, *Canis lupus*, range, dispersal, St. Lawrence River, Québec.

Historically, Wolves (*Canis lupus*) were distributed across most of North America. They were extirpated in the southern portion of their range by the turn of the century (Nowak 1983). In Québec, Wolves disappeared from the south shore of the St. Lawrence River around 1850-1900 (Peterson 1966). The extermination of the Wolf and the development of agriculture in the mid-1900 facilitated the extension of Coyote (*Canis latrans*) range. Wolves are now mostly limited to the northern and less populated regions of North America (Wayne et al. 1992).

On 19 January 2002, a male Wolf was trapped near the village of Sainte-Marguerite-de-Lingwick (45°36'15"N, 71°17'15"W) in the Eastern Townships of southern Québec. The Wolf weighed 29.1 kg, similar to the weight of an adult from Papineau-Labelle (Potvin 1986\*) or a yearling from the Laurentides region (Jolicoeur 1998\*). A tissue sample was collected from the temporal muscle for genetic identification of the species. DNA analyses were performed by the Natural Resources DNA Profiling and Forensic Center (Trent University, Peterborough, Ontario K9J 7B8 Canada) following the method described in Wilson et al. (2000). The Eastern Townships sample was profiled at the mitochondrial DNA (mtDNA) control region and 8 microsatellite loci. The genetic profile was compared to samples of canids representing the Eastern Wolf (*C. lupus lycaon*) from Algonquin Provincial Park; Western Coyotes (*C. latrans*) from Texas, North Carolina and Ohio; and Wolves (*C. lupus*) from Pukaskwa National Park, northeastern Ontario and the Laurentide Wildlife Reserve region north of Québec City. The above populations were used to compare the Eastern Townships sample against *C. lupus lycaon*, *C. latrans* and *C. lupus* to assess the species-of-origin or hybrid genotype.

The sample had a mtDNA consistent with *C. l. lycaon*/*C. latrans* and the microsatellite genotype suggested 95.0% shared ancestry with Eastern Wolves from Algonquin Provincial Park. The sample had a DNA profile consistent with an Eastern Wolf. The Eastern

Wolf is generally described as being smaller than other Gray Wolf subspecies (Nowak 1995, 2002). Although it has been proposed as a distinct species (*C. lycaon*) by Wilson et al. (2000), its status as a subspecies is still generally accepted. Some authors suggest it may result from hybridization between *C. rufus* and *C. lupus* (Nowak 2002). In Québec, the Eastern Wolf is found mostly in the southern deciduous and mixed forests (Jolicoeur and Henault 2002\*). Coyote genes found in the mitochondrial DNA of the specimen have been reported before in Wolves in eastern Canada (Lehman et al. 1991; Wilson et al. 2000). Wolves and Coyotes are most likely to interbreed when Wolf density is low relative to Coyotes and when the species are similar in size. In southern Québec, male Coyotes weigh 14.6–18.7 kg (Fortin and Huot 1995\*; Dumond and Villard 2000; Villemure 2003\*).

Wolf dispersal has been monitored in southern Québec (Messier 1985; Potvin 1987; Jolicoeur 1998\*; Villemure 2003\*, but Wolves have not been documented crossing the St. Lawrence River. Harrison and Chapin (1998) identified two potential corridors linking Wolf populations north of the St. Lawrence River to potential habitat in Maine and New Hampshire. However, movements of Wolves south of their current range are thought to be unlikely because of potential barriers such as the St. Lawrence Seaway and regions with high human population, high road density and intensive agriculture (Wydeven et al. 1998). Potential core habitat for Wolves has been identified in New England as well as the Eastern Townships and Beauce regions of Québec (Harrison and Chapin 1998; Mladenoff and Sickley 1998; Carroll 2003\*; Jolicoeur and Etcheverry, in preparation\*).

Wolves are highly mobile and frequently move over long distances (Van Camp and Glukie 1979; Fritts 1983; Mech 1987). Some of the longest dispersal movements documented (460-555 km) occurred across a mixture of forest, farmland, and 4-lane highways in the upper Midwest (Mech et al. 1995; Wydeven et al. 1995). A Wolf in Alberta crossed rivers 0.5 - 2.0 km

wide during summer (Van Camp and Glukie 1979), and Wolves have crossed 24 km on a frozen lake (Mech 1966). Wolves have increased in Minnesota (Fuller et al. 1992), and since the mid-1970s have naturally recolonized portions of northern Wisconsin and, more recently, Upper Michigan (Mech and Nowak 1981; Fuller et al. 1992). Wolves from Canada have recolonized Montana for at least the past decade (Boyd et al. 1995). In a review of Wolf dispersal and recolonization, Wydeven et al. (1998) reported that 31 to 63% of dispersing Wolves successfully settled and formed pairs in new territories.

It is unclear whether Wolves have begun re-establishing in the Eastern Townships, or whether this Wolf was simply a dispersing individual. While the Eastern Townships may be a sink habitat for Wolves, this Wolf was caught only 30-50 km from potential Wolf habitat in Maine (Carroll 2003\*). Further investigation is necessary to confirm other possible Wolf observations in these regions. Reporting of Wolf sightings or accidental Wolf captures south of the St Lawrence river should be encouraged.

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