

Movements of Two Rabid Raccoons, *Procyon lotor*, in Eastern Ontario

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Rosatte, Rick, Mike Allan, Rob Warren, Peter Neave, Todd Babin, Luke Buchanan, Dennis Donovan, Kirk Sobey, Chris Davies, Frances Muldoon and Alex Wandeler. 2005. Movements of two rabid Raccoons, *Procyon lotor*, in Eastern Ontario. Canadian Field-Naturalist 119(3): 453-454.

An adult female Raccoon *Procyon lotor* was captured about 3 km north of Mallorytown, Ontario, on 27 August 2004, as part of a government rabies control program. The animal was vaccinated against rabies, ear-tagged and released, and recaptured the next day 1.7 km south of the initial capture location. Upon recapture, the Raccoon had porcupine quills in its facial area and seemed agitated and was submitted for rabies testing. It was confirmed as rabies positive on 31 August 2004, by the Canadian Food Inspection Agency. Similarly, a juvenile male raccoon was captured, ear-tagged, vaccinated, and released near Junetown, Ontario (about 4 km NW of the other rabid Raccoon) on 5 September 2004. It was found dying in a residential window well on 22 September 2004, 700 meters from the original capture location. It was diagnosed as rabid on 23 September 2004.

Key Words: Raccoon, *Procyon lotor*, rabies, movement, disease transmission, Ontario.

The Raccoon, *Procyon lotor*, variant of rabies was first reported in Ontario, Canada, in July 1999 and 131 cases have been reported to September 2005 (Wandeler and Salsberg 1999; Rosatte et al. 2001). In response to these cases, the Ontario Ministry of Natural Resources (OMNR) implemented three different tactics to control the disease: Trap-Vaccinate-Release (TVR), Point Infection Control (PIC), and Oral Rabies Vaccination with baits (ORV) (Rosatte et al. 2001). The use of TVR involves live-capture (with humane cage traps) and vaccination with an injection of Imrab rabies vaccine (Merial, Athens, Georgia). Release of target animals such as Raccoons allows researchers to gain information on movements if the animals ear-tagged for identification during processing are recaptured. In addition, data regarding the movement of rabid Raccoons is scarce in the literature.

On 27 August 2004, an adult female Raccoon was captured (Tomahawk live-trap, Tomahawk, Wisconsin) (about 3 km north of Mallorytown, Ontario), as part of a TVR program in response to two cases of Raccoon strain rabies that had occurred near Mallorytown during mid-August 2004. This Raccoon appeared normal except it was vocalizing repeatedly with high-pitched whining sounds. A young female Raccoon was also captured at the same time about 2 meters from the adult female Raccoon and was probably one of her litter (as the adult female was lactating). Both Raccoons were ear-tagged, vaccinated against rabies (Imrab) and released at the point of capture. A Global Positioning System (GPS) reading (Magellan Trailblazer 300) was taken at the location where the animal was captured (430112E, 4927926N). The next day, 28 August 2004, the adult female Raccoon was recaptured at GPS

430094E, 4926235N, 1.7 km south of the initial capture location. On this occasion, the Raccoon was very agitated – constantly moving back and forth in the live-trap, turning upside down repeatedly, vocalizing with a high-pitched whine, and had three Porcupine, *Erethizon dorsatum*, quills in its facial area (snout). This Raccoon was humanely euthanized (via an injection) and submitted to the Canadian Food Inspection Agency, Ottawa Laboratory Fallowfield (CFIA OLF) in Nepean, Ontario, for rabies testing. Another lactating adult female Raccoon and two young female Raccoons were also captured at this time within 4 meters of the quilled Raccoon. These three Raccoons were ear-tagged, vaccinated against rabies with Imrab and released. The quilled adult female Raccoon was confirmed at CFIA OLF as positive for rabies on 31 August 2004. On 1 September 2004 the virus was determined at CFIA OLF to be the Raccoon variant of rabies.

On 5 September 2004, a juvenile male Raccoon was captured, ear-tagged, vaccinated, and released near Junetown, Ontario (about 4.2 km NW of the other rabid Raccoon at GPS 426300E 4928200N). The Raccoon appeared normal at the time. Several other Raccoons were also captured at this location. It was found dying in a residential window well on 22 September 2004, 700 meters from the original capture location. This raccoon was diagnosed as rabid on 23 September 2004.

Data regarding the movement of rabid Raccoons is critical when designing rabies control tactics, especially when determining the width of vaccination zones to contain the disease (Rosatte et al. 2001). Even less is known about the contact rates of rabid Raccoons with susceptible animals. These rates will, in turn, affect the intensity and movement of a rabies outbreak (Totton et

al. 2002). Due to the close proximity of the rabid Raccoon to the four other Raccoons that were captured, as well as the Porcupine quills in the rabid Raccoon (no rabid Porcupines have been reported in the area), there was great potential for this Raccoon to have transmitted rabies to multiple individuals, both intra-specifically as well inter-specifically, during its journey of at least 1.7 km (assuming the Raccoon moved in a straight line which is unlikely). Analysis of the mark-recapture data from the area in which the rabid Raccoon was captured indicated that the average Raccoon density was 10 raccoons/km². Given this high Raccoon density, the potential for rabies transmission to susceptible individuals in the area where the rabid Raccoon travelled was probably very high. This information was subsequently used to modify the OMNR's response to Raccoon rabies in eastern Ontario; the area where the rabid animal was captured was re-trapped and all abnormally acting Raccoons and Striped Skunks (*Mephitis mephitis*) were humanely euthanized and submitted for rabies testing. All animals that had been vaccinated during previous years were re-vaccinated against rabies and released.

Also of importance is the fact that both of these Raccoons were vaccinated against rabies, though vaccination did not protect them from developing clinical rabies. This in all likelihood was due to the fact that the first Raccoon already showed prodromal symptoms at the time of vaccination and the other Raccoon was incubating the disease. This emphasizes the value of Point Infection Control programs using population reduction around previous cases of rabies to remove clinical and incubating animals from the population — i.e., had population reduction been utilized instead of TVR both of these Raccoons would have been humanely euthanized and removed from the population negating any

potential for them to infect other animals. On the other hand, population reduction would also have killed a large number of healthy animals that were already vaccinated against rabies from aerial baiting or previous TVR work. In this particular instance TVR provided valuable information, though euthanasia would have been the preferred disease control option. Obviously, both TVR and population reduction have their advantages when used for the control of wildlife rabies.

Acknowledgments

The Ontario rabies program is supported by the Provincial Rabies Advisory Committee, Dr. J. Carlson, Chair, and the Ontario Ministry of Natural Resources (OMNR), Wildlife Research and Development Section, Dr. C. Davies, Manager. Special acknowledgment goes to the staff of the OMNR, Rabies Research and Development Unit in Peterborough and the CFIA, OLF Rabies Laboratory, Nepean. This is OMNR Wildlife Research and Development Section contribution number 04-05.

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Received 27 September 2004

Accepted 6 September 2005