



Oral Rabies Vaccination Program

Introduction

Beginning in 2002, the National Park Service started a collaborative effort with the Animal and Plant Health Inspection Service – Wildlife Services (APHIS- WS) to control the spread of rabies in raccoons, coyotes, and gray foxes. APHIS- WS prepared a programmatic Environmental Assessment and issued a Finding of No Significant Impact on July 30, 2001 that outlines an effort to control rabies through ground and aerial distribution of an oral vaccine via bait packages. Subsequently, the National Park Service has worked on the preparation of additional Environmental Assessments, specific to parklands. Staff at Shenandoah National Park has had the opportunity to review this Assessment as it was being prepared. The Finding of No Significant Impact for the Assessment that covers Shenandoah National Park was signed on July 27, 2005. Specifics regarding program implementation, which will be accomplished by APHIS- WS have not come forward yet.



Oral rabies vaccination bait sachets.

Management Needs

Rabies is an acute, fatal viral disease of mammals most often transmitted through the bite of a rabid animal. The disease can be effectively prevented in humans and many domestic animal species, but abundant and widely distributed reservoirs among wild mammals complicate rabies control. Within most of the U.S., these reservoirs occur in geographically discrete regions where the virus transmission is primarily between members of the same species (Krebs et al. 2000). These species include but are not limited to raccoons (*Procyon lotor*), coyotes (*Canis latrans*), skunks (primarily *Mephitis mephitis*), gray foxes (*Urocyon cinereoargenteus*), and red foxes (*Vulpes vulpes*). Species specific variants of the virus may be transmitted to other animal species. However these encounters rarely result in sustained virus transmission

within that animal species. Once established, virus transmission within a specific animal species can persist at epidemic levels for decades, even perhaps for centuries (Krebs et al. 2000).

Over the last 100 years, rabies in the U.S. has changed dramatically. About 90% or greater of all animal cases reported annually to CDC now occur in wildlife (Krebs et al. 2000; CDC 2001a). Before 1960 the majority of cases were reported in domestic animals. The principal rabies hosts today are wild carnivores and bats. The number of rabies related human deaths in the U.S. has declined from more than 100 annually at the turn of the century to an average of one or two people/year in the 1990s. Modern day prophylaxis, which is the series of vaccine injections given to people who have been potentially or actually exposed, has proven nearly 100% successful in preventing mortality when administered promptly (CDC 2001a). In the U.S., human fatalities associated with rabies occur in people who fail to seek timely medical assistance, usually because they were unaware of their exposure to rabies.

Although human rabies deaths are rare, the estimated public health costs associated with disease detection, prevention, and control have risen, and are estimated to exceed \$300 to \$450 million annually. These costs include the vaccination of companion animals, maintenance of rabies laboratories, medical costs, such as those incurred for exposure case investigations, rabies post- exposure prophylaxis (PEP) and animal control programs (CDC 2001a).

Based on surveillance data, raccoon rabies did not exist outside a focus in Florida before the 1940s and is, therefore, considered an exotic strain in the U.S. outside this area. After raccoon rabies was described in Florida, it spread slowly during the next three decades into Georgia, Alabama, and South Carolina. It was unintentionally introduced into the mid- Atlantic states, probably by translocation of infected animals (Krebs et al. 1999). The first cases appeared in West Virginia and Virginia in 1977 and 1978. Since then, raccoon rabies in the area expanded to form the most intensive rabies outbreak in the U.S. The strain is now enzootic in all of the eastern coastal states, as well as Alabama, Pennsylvania, Vermont, West Virginia, and, most recently, parts of Ohio (Krebs et al. 2000). In the past 21 years, all of the mid- Atlantic and New England states have experienced at least one outbreak. The raccoon rabies epizootic front reached Maine in 1994, reflecting a movement rate of about 30 miles per year (48.3 km/yr). It was also first confirmed in northeastern Ohio in 1996 (Krebs et al. 1998). In 1999, the first three cases of raccoon rabies were confirmed in southern Ontario (Rosatte et al.



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2001) and the strain has recently been reported in New Brunswick.

Current Procedures

The program will involve the distribution of oral rabies vaccination (ORVAC) baits to create zones of vaccinated target species that would then serve as barriers to cease the further advancement of raccoon rabies virus variants. Vaccination zones would be determined in cooperation with several state rabies task forces and/or other agencies with jurisdiction over vaccine use and application in wildlife and domestic animal species. The program would involve the use of APHIS- WS federal funds to purchase and distribute ORVAC baits.

On an annual basis, one treatment of ORVAC baits could be distributed by aircraft (fixed- wing airplane or helicopter) and ground placement on the NPS units. The need to distribute baits on each of the park units would be assessed annually and based on the most current distribution of rabies cases and the expected direction of disease spread. The annual treatment would continue on a reoccurring basis until the goals of the ORVAC program have been met. Baits would be distributed at an average density of 75 per square km during the spring and/or fall months (February 1- May 31 and/or August 15 to November 30). Air drops would be typically conducted at about 500 feet above ground level and would only fly momentarily over any one point on the ground during any given bait distribution flight. The aircraft do not circle over areas repeatedly, but fly in straight "transect" lines for purposes of bait distribution. ORVAC baits would not be aerially distributed in areas that are frequently used by a high volume of park visitors (i.e., visitor centers, campgrounds, etc.), as well as over lakes, reservoirs, and large rivers. Aerial distribution of baits would primarily target areas of habitat suitable for the target species. When aerial distribution by fixed- wing or helicopter aircraft is not practical, baits would be distributed by careful hand placement to help to minimize contact by humans, pets and other domestic animals.

Details regarding implementation of the vaccination program at Shenandoah National Park have not yet been worked out.

References

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