

**NATIONAL PARK SERVICE
GREAT SMOKY MOUNTAINS NATIONAL PARK
BRIEFING STATEMENT**

FEBRUARY 2003

SUBJECT: Non-native Wild Hog Control

The European wild boar (*Sus scrofa*) was introduced into a private hunting preserve in North Carolina in 1912. Some animals subsequently escaped from the enclosure and, by about 1950, spread into the Park, as well as into the adjoining state of Tennessee. They first entered the western end of the Park, but are now found throughout the Park, although a variety of factors causes much variation in their population density. Park managers are most concerned about the hog's destructive effects on natural ecosystems and competition with native species.

Their rooting for food profoundly disrupts many natural vegetative communities, individual species populations, forest successional patterns and forest nutrient cycles, especially the nitrogen cycle. In some forest communities, such as gray beech forest, understory cover may be reduced to five percent of its normal ground density and changes in forest structure and composition have been identified. Areas adjacent to streams and springs often suffer high rates of soil erosion and increased sediment loading which severely affects water quality and aquatic habitat. As well as disturbance to their habitat, *Trillium erectum* (wake robin), *Claytonia virginica* (spring beauty), *Erythronium americanum* (fawn lily), and *Lilium superbum* (Turk's cap lily) have been documented as food items in the wild hog's diet. They are also known to undergo severe localized population depletions as a result of hog rooting. Many plants are unique or of special concern, and many more native plants suffer some degree of disturbance from rooting and direct predation.

Native animal populations are also affected by the wild hog's foraging habits. One direct effect is predation. They eat large quantities of invertebrates and vertebrates, including snails, crayfish, and a variety of amphibians. The Park has been designated as an International Biosphere Reserve and has an international reputation for its variety and number of salamanders. The Jordan's red-cheeked salamander, an endemic species to the Park, is one of a number of amphibians that have been found in the dissected stomachs of wild hogs.

An indirect consequence of wild hog foraging patterns is the disruption of small mammal forest floor habitat. A notable reduction of population numbers of voles, moles, shrews, and mice has been noted in rooted areas as compared to unimpacted habitat. The wild hog is in direct competition with these small mammals for insects, earthworms, and other invertebrates, as well as utilizing them for food.

In addition to the damage caused by their rooting, the wild hog also competes directly with native animals for food, especially acorn mast. Most notable competitors are white-tailed deer, turkey, squirrels, chipmunks and black bears. In years when hard mast is plentiful, this competition may not be as critical, but in years of poor mast production intense competition with native species could significantly reduce native population numbers. The precise impact of this competition has not been fully documented. However, it is important to note that wild hog range expansion and seasonal movements appear to be a function of mast

supply and temperature changes throughout the year.

The detrimental effect of wild hog rooting upon the aesthetic and wilderness values of the Park is of concern in itself. In the past, written and verbal visitor complaints concerning hog rooting sign along hiking trails have been documented. The Park has in excess of 140 cemeteries which are a vital part of its cultural heritage. There are documented cases of the disturbance of grave monuments in cemeteries caused by wild hog rooting activities.

The wild hog serves as a co-host with domestic and wildlife species for infectious and parasitic diseases. Higher concentrations of fecal coliform bacteria have been found in wild hog-occupied drainages than in unoccupied streams. High fecal coliform counts may indicate the presence of other disease pathogens as well. The wild hog's routine of creating and using wallows in mesic sites is conducive to the spread of disease. The potential of disease transmittal to humans through water contamination is also a possibility. Hogs have not yet been evaluated for the transmission of Giardia lamblia, an incapacitating and an uncomfortable disease contracted by drinking untreated water.

The implications of wild hog and feral hog management are regional in scope. Unchecked populations of wild hogs can serve as an uncontrollable reservoir for diseases that can spread to domestic livestock. These infectious diseases are of major concern to the U.S. commercial pork industry. In 1990, blood samples taken from 108 hogs tested negative for brucellosis, pseudorabies, and Bovine Viral Disease. Forty-four percent of these tested positive for exposure to leptospirosis, but no active cases have been documented. Recently, wildlife handlers have observed abnormal behavior characteristics in the wild hog population leading wildlife biologists to suspect that domestic or pen raised pigs are being released near the Park. Because of this concern, in 1999/2000 another 195 blood samples were collected and tested for brucellosis and pseudorabies. Although, these samples tested negative for brucellosis, one sample was suspect for pseudorabies but could not be confirmed. Biologists are concerned that animals brought in from outside the Park could carry infectious diseases and contaminate wild animals which would result in a quarantine that would have serious implications on our current practice of relocating accessible animals out of the Park. For this reason, additional samples will be collected and tested from animals that exhibit abnormal color or behavioral characteristics.

For all these reasons the Park's management strategy focuses on reducing the impact of wild hogs by reducing the hog population through hunting and trapping and by fencing off extremely sensitive areas to keep hog disturbance from causing irreversible damage. Over 10,000 wild hogs have been removed since control efforts began in the late 1950's. Of that total, over 9,000 have been eliminated since 1977 when the Park began hiring personnel especially to remove hogs. This reduction in the hog population has greatly reduced hog damage to the Park. Rooting impacts are now much less severe in the backcountry and nearly nonexistent in accessible areas except at the onset of winter.

After nearly 15 years of concerted control efforts, the Park's estimated hog population, has dropped from an estimated 1-2,000 in 1990 Park to 500-600. Population modeling research has shown that to keep hog numbers stable about 1/2 the adult population must be removed each year. Park biologists now believe that 50% removal rate is currently being achieved because, the average number of hogs taken has stabilized since 1990 with an average of just under 300 hogs annually being taken. However, population numbers can vary greatly over a short period of time in response to major shifts in food supply or extreme weather events. So, it is vital that control pressures be maintained or their population could rebound to pre-1986 levels in as little as two years. Finding enough funding to support hog control at an effective level remains a problem.

One encouraging sign comes from an unexpected quarter. In the past few years, hog control personnel have been finding coyote scat containing large amounts of piglet or shoat hair, and occasionally adult hog hair. They also report that coyote tracks are frequently found in areas of hog activity. Although coyotes are not able to take adult hogs, they have become a significant ally in Park hog control efforts by taking younger hogs before they reach breeding age.

Research into the natural history of the wild hog, trap bait enhancement studies, disease potential, and means to index (quantify) hog numbers and disturbances continue to be prime investigation topics. Hogs may not be eliminated from the Smokies, but with adequate funding, their impact can be held to a tolerable level using an integrated approach.

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