

PROGRAM ACTIVITY REPORT (PAR)

Feral Swine as Biosentinels for *Bacillus anthracis*

Anthrax is a disease caused by the bacterium *Bacillus anthracis*. Historically, anthrax caused widespread economic losses for ranchers and regularly impacted human health. In 1881, Louis Pasteur created a livestock vaccine that largely mitigated the impacts of *B. anthracis*. More recently, *B. anthracis* spores have been used as a biological weapon, resulting in a renewed interest in the epidemiology of anthrax.

When not multiplying within a competent host, the bacterium will rest in spore form within the soil. Wild and domesticated herbivores ingest or inhale these spores while grazing. Once *B. anthracis* spores enter the body, they become reactivated and begin replicating, resulting in toxin formation that is often lethal to the individual. Upon death, some vegetative bacteria will escape from the carcass and form spores again in the soil. These spores may persist for decades, waiting for the right environmental and biological circumstances in which to reproduce again.



Feral swine often forage in ephemeral ponds and riparian areas, features on the landscape that are thought to concentrate *B. anthracis* spores. Sampling protocols that look directly for *B. anthracis* spores within soil samples are in widespread use. While often necessary for bacterial isolation and genetic profiling, these techniques are expensive, labor intensive, and may be exposed to *B. anthracis* spores occurring throughout their home range. If their infection is sublethal and they produce antibodies, we can simply test for *B. anthracis* exposure using a commercially available serological test.

A pilot project using sera from the NWDP's feral swine serum archive is currently underway. Over 200 individuals from known anthrax outbreak areas were chosen and represent feral swine from TX, CA, NV, OK, and LA. Preliminary results suggest that feral swine may be excellent indicators for the presence of *B. anthracis* in the environment. Follow-up testing to validate the presumptive positive results is currently underway.

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sive, and sample only a very small portion of the landscape.

The NWDP has been exploring the suitability of using feral swine as biosentinels for *B. anthracis* in the environment. Individual feral swine, by virtue of their feeding/rooting behav-

The original artwork on this page was created by the National Wildlife Disease Program's Erika Kampe and Sarah Goff