A Closer Look At Feral Pig Rooting Disturbance

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In Texas especially, there is a lot of long-standing farm wisdom regarding feral pigs, some of which is useful and true. Here is what is true: Feral pigs are invasive mammals that cause an estimated $1.5 billion in damages and control costs in the United States annually. They cause significant agricultural damage through the consumption and destruction of crops, they compete both directly and indirectly with native wildlife, and they disrupt native ecosystems through their destructive rooting and wallowing behavior. Texas is estimated to have roughly 2.6 million feral pigs, which is roughly half of the total that live in the contiguous United States, depending on the population estimate. Feral pigs are an important species to research due to their destructive nature.

In discussions of feral pig damage, often cited figures are agricultural and property damage costs. However, given the sheer size of the population of feral pigs in Texas, it is worth considering how they impact less frequently examined features such as soil components, rates of soil erosion and deposition, and plant species composition. In 2017, the Borderlands Research Institute (BRI) began investigating the effects that feral pig rooting behavior has on these components.

BRI researchers partnered with the Texas Parks and Wildlife Department’s Kerr Wildlife Management Area to determine how feral pig rooting behavior was affecting soil components, rates of soil change and plant species composition. Data were collected on a variety of soil components, including soil carbon, soil nitrogen, soil moisture content, soil pH and soil texture. Data were also collected measuring the rates of soil erosion between rooted and unrooted sites utilizing soil erosion bridges. Finally, vegetation sampling was conducted to examine the differences in species composition between rooted areas and undisturbed sites.

Results from the analysis of erosion data indicated that rooted sites exhibited higher variation within the rates of soil change when compared against unrooted sites. The implication of this was that rooting behavior could be causing relatively larger...
changes in soil levels when compared against ambient levels of soil loss. This is significant because the soil being lost is in the top soil horizons, which are often the most abundant in soil nutrients necessary for healthy plant growth. Eroded soils with depleted soil horizons do not support as wide a variety of plant species and are often prone to invasion by non-native plant species. Diminished plant communities support fewer livestock and wildlife species, so maintaining soil health is an important component of proper land management.

Results from the analysis of soil components between rooted and unrooted soil samples indicated several interesting trends. First, the data indicated that several soil processes were interacting. For example, increased soil carbon, soil nitrogen and soil pH were shown to be correlated with decreases in soil texture. Furthermore, soil moisture was positively correlated with soil texture. This is because soil texture was defined as percent clay content, and clay dominant soils absorb moisture more easily.

Most importantly, rooted soil samples had distinctly altered values compared against unrooted samples. These results provide evidence for the claim that rooting disturbance is causing negative shifts in our measured soil components. The implications are that these alterations could cause reduced soil quality by shifting these soil components, which could potentially hinder successful vegetation regrowth after rooting disturbance, leading to less rigorous and diverse plant communities. This in turn could lead to reduced forage and grazing quality within the disturbed areas.

Results from our vegetation surveys indicated a decrease in the number of plant species present in transects of rooted sites compared against unrooted sites. Rooted areas contained roughly 36 percent of the total plant diversity measured, while unrooted areas contained roughly 89 percent. This indicates that undisturbed sites had much higher plant diversity when compared against rooted sites.

The plants that initially recolonized the rooted areas were often a mix of native and non-native plants. These were often species that thrive in disturbed soils, such as doveweed (Croton monanthognus), cowpen daisy (Verbesina encelioides), King Ranch bluestem (Bothriochloa ischaemum), mealycup sage (Salvia farinacea), silverleaf nightshade (Solanum elaeagnifolium) and horehound (Marrubium vulgare). The implications of these results is that there is now localized descriptive evidence supporting the claim that feral pig rooting behavior alters species composition in the Edwards Plateau. This is relevant information because Kerr and the surrounding counties in the region are replete with feral pigs, and it is helpful to both landowners and biologists to have information regarding their effects on plant communities.

The study period for this data was relatively short-term, and therefore is not useful for observing the long-term effects of rooting disturbance on plant communities. The next step should be a longer-term study on these effects. Data provided from this study helps provide a clearer picture of how feral pig rooting behavior can potentially alter a variety of soil components, rates of soil erosion and deposition, and disturbed plant communities within the Edwards Plateau. Continuing to evaluate how feral pigs disturb native flora and fauna will be vital in the upcoming years to ensure that wildlife professionals can make informed management decisions.