

# How do wild pigs affect riparian systems?

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In the U.S., wild pigs are an invasive species and can cause a lot of damage to the ecosystems in which they live. In the September 15<sup>th</sup> Soils Matter blog, Sara Bolds from Auburn University writes about how wild pigs can hurt riparian areas.

"If you live in the southeastern United States, there's a good chance you've encountered wild pigs or their damage. They can live along stream beds and dig in fields or along roadsides. In the U.S., wild pigs are an [invasive species](#) and don't have many predators. They can affect [water](#) quality, compete with native species for resources, and spread disease. This can have significant impacts on other wildlife, the environment, and to humans and [domestic animals](#)," says Bolds.

So where did these wild pigs come from? Domestic swine originate from Eurasian boar, which are native to Europe and parts of Asia. The first domestic swine in North America were brought over by European settlers in the 16<sup>th</sup> century. Eventually some of these animals escaped, became feral, and established breeding populations.

The first wild boar were imported from Germany in the late 1800's and released onto a game preserve in New Hampshire. Many introductions and releases of wild boar and domestic pigs have occurred since then. Wild pigs have spread across North America into an estimated thirty-one states. Today, most populations in the U.S. are hybrids of [domestic swine](#) and wild boar and are referred to by many names—including feral hog, feral pig, wild boar, and feral swine. Essentially all these animals are considered the same species (*Sus scrofa*).

While wild pigs can survive in a surprisingly wide range of habitats, they are frequently found in wetlands and along streams, called riparian areas. These habitats have an abundance of resources typically available, such as food sources, water, and shelter.

Having wild pigs living along streams is concerning. Riparian habitat is rapidly declining and provides important ecological and public health benefits. Riparian areas provide habitat for wildlife and plant species and water filtration and storage. Even wild salmon spend part of their lives along stream banks.

Wild pigs can cause changes at multiple "zones" of a watershed. Besides digging ("rooting"), they also roll around in the mud ("wallowing"). Both disturb the soil which can negatively impact plants, soil invertebrates, and ground-dwelling animals. This soil disturbance can also affect nutrient cycling by disrupting natural soil processes.

Pig traffic across or up and down the stream bank can impact bank stability, leading to soil erosion. It can damage vegetation along the stream that create an important buffer between water and land. Wild pigs may also use the stream channel itself, which can increase erosion and sediment in the water and affect nutrient cycling. They also use the stream as their personal bathroom, introducing feces and urine. All these actions can have negative effects on aquatic plant and animal species.

For Bold's research at Auburn University, the team studied the impacts of wild pig presence in small, forested streams to determine if they were impacting water quality and increasing fecal bacteria levels. As wild pigs are a huge problem in Alabama, it's important to know if wild pig activity in riparian areas is a public health risk. This is similar to how gulls along beaches have been shown to be related to beach closings.

The team collected water samples from small streams at two properties: one with a high density of wild pigs and one without an established population. They analyzed water samples for total suspended solids (such as sediment), dissolved organic carbon, organic and inorganic nitrogen, and fecal bacteria, specifically *Escherichia coli* (*E. coli*) and other fecal coliform bacteria. They also sent [water samples](#) to a lab to test for swine fecal bacteria DNA to confirm that pig feces were entering the stream water.

The analyses found that concentrations of organic carbon and nitrogen were greater in the streams with wild pigs than those without pigs. We attribute that to pig feces and urine in the water. However, there wasn't a

difference in concentrations of total suspended solids or inorganic nitrogen.

There was a considerable difference in *E. coli* concentrations between the streams with pigs and those without pigs. *E. coli* concentrations in the streams with wild pigs were forty times the concentrations in the streams without pigs. The levels in streams with pig populations were higher than the recommended limits set by the U.S. Environmental Protection Agency. Lab analyses found swine fecal bacteria DNA in most of the samples from the property with wild pigs, so the team was able to confirm that wild pig feces were entering the study streams since there weren't any domestic pig facilities near our study sites. They did not find a difference in fecal coliform concentrations.

This research showed that wild [pigs](#) can be a threat to [water quality](#) in [riparian areas](#) by introducing fecal material and disease-causing organisms. This indicates that it may be important to control wild pig populations upstream of major drinking water sources and recreational areas to protect public health.

This blog is based on research published in the *Journal of Environmental Quality*.

**More information:** Sara A. Bolds et al, Impacts of a large invasive mammal on water quality in riparian ecosystems, *Journal of Environmental Quality* (2021). [DOI: 10.1002/jeq2.20194](https://doi.org/10.1002/jeq2.20194)

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