# Naturally vegetated buffers work for wildlife and water quality

Naturally vegetated buffers can protect water quality and establish habitat for wildlife. That's the take-home message from a study by North Carolina State University (NCSU).

The study found that increasing the width of a streamside buffer by simply allowing natural revegetation removed most nitrate from swine waste effluent in shallow ground water. The study also found that in North Carolina, specific vegetation is not needed to make riparian habitat suitable for wildlife.

Not all agricultural systems would need as wide of buffer as was needed in this study because the amount of nitrate from swine effluent moving from the agricultural field into the buffer was greater than normal rates. However, most of the nitrate in the shallow ground water was removed through denitrification within the buffer area.

Shallow ground water nitrate-nitrogen was reduced following buffer widening to 100 feet, by 95 percent on the east side of the stream and 93 percent on the west side of the stream. Prior to buffer widening, reductions observed were 35 percent in the eastern buffer zone and 53 percent in the western buffer zone.

### Wildlife habitat

For the wildlife portion of the study, three sites were evaluated for their habitat potential: a multistage riparian area, a shrub buffer zone, and a planted forest buffer. All three sites were located in the Middle Coastal Plain of North Carolina.

Common species such as cane, goldenrod, horseweed, and dogfennel (*Eupatorium capillifolium*) were observed in all three buffers. Other species, such as sericea lespedeza, Chinese privet, and Japanese honeysuckle, were detected in one buffer and not present in the other two. Species richness for the planted buffer and shrub buffer was 30 and 37 species, respectively. Species richness for the multistage buffer was 63 species.

"The types of vegetation present at each site undoubtedly played a major role in determining the bird community found within each," says NCSU Extension Wildlife Specialist Chris Moorman.

The vegetation composition at the multistage buffer incorporated characteristics of grassland, shrub, and woodland into a single streamside area. As a result, the area was occupied by a wide range of bird species ranging from grassland to shrub and woodland species.

Vegetation present at this site was volunteer. Restoration of the riparian habitat involved simply allowing native vegetation to recolonize the area. This suggests that vegetative plantings of species suitable for surviving in riparian conditions need not necessarily be planted for the area to act as a functional streamside zone. The large trees along the streambank, although sparse, effectively supported woodland species.

The information offers valuable insight to U.S. Department (USDA) Natural Resources Conservation Service (NRCS) in working with landowners, according to Ed Hackett, a biologist with the NRCS Agricultural Wildlife Conservation Center (AWCC).

The study was aided by a grant from the AWCC in cooperation with the former Watershed Science Institute. The AWCC is a fish and wildlife technology development center located in Madison, Mississippi.

**Multistage buffer with no planting (*top*); Shrub buffer (*middle*); Forest riparian buffer (*bottom*)**

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