

# MAKING WATER QUALITY MARKETS WORK – LITTLE RIVER NUTRIENT BANK CASE STUDY

Steven Glickauf and Kelly Siragusa

---

AUTHORS: Wildlands Engineering, Inc., Lawrenceville, Georgia, 30043.

REFERENCE: *Proceedings of the 2011 Georgia Water Resources Conference*, held April 11–13, 2011, at the University of Georgia.

---

**Abstract.** Major fish kills in the estuaries of North Carolina prompted state officials to enact legislation regulating nutrient runoff from hog farms, other types of agriculture, and urban runoff to help improve water quality in their coastal basins (Maloney et al. 2000). In 1997 the North Carolina Environmental Management Commission established the Neuse buffer and nutrient rules, which, as part of a larger regulatory framework, established mitigation requirements for riparian buffer and nutrient impacts.

Wildlands developed the 30-acre Little River Farm Mitigation Bank to offset authorized riparian buffer and nutrient impacts in the Neuse basin. The site was previously in intensive agricultural management with no forested riparian buffers on the streams and runoff conveyances around the property. Restoration of the buffers and permanent protection of the site generated approximately 50,000 Nitrogen credits (based on the lbs of Nitrogen removed over 30 years) over a five year release schedule that can be used to offset both point source and non-point source impacts in the basin.

Developers must weigh the on-site development and land costs of reducing nutrients at the point of impact with that of purchasing nutrient credits from a variable market nutrient bank. Point source impacts must weigh reducing nutrient loading with improved efficiency, point source to point source trading scenarios, or purchasing nutrient credits from an approved bank. Making nutrient trading programs work both ecologically and economically requires a regulatory framework to provide market demand and assurances that management practices are providing the needed offsets.

reveal important considerations for the use of offsets as a water quality management strategy.

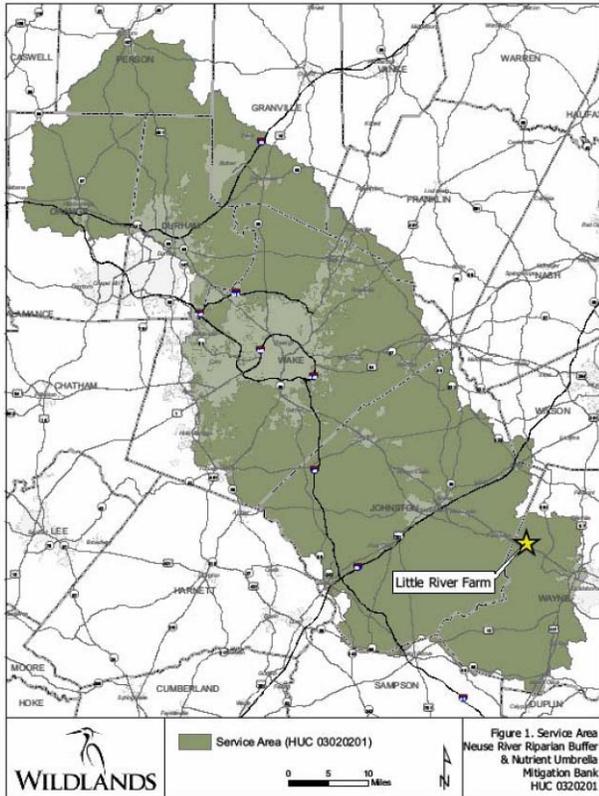
## LITTLE RIVER FARM

The Little River Farm is a NC Division of Water Quality approved nutrient and riparian buffer bank in Wayne County, North Carolina. The project will be protected in perpetuity through a restricted covenant and is approved under an Umbrella instrument, the Wildlands' Neuse Umbrella Banking Instrument, which allows for additional properties to be added in the future. Wildlands is a habitat development, land management, and environmental planning company with projects throughout the Western and Southeastern United States. Wildlands works with the agencies and landowners to identify sites appropriate for developing and implementing mitigation projects that provide valuable ecosystem offsets.

Little River Farm is authorized by NC Division of Water Quality to provide nutrient and riparian buffer offset credits in the Neuse River Basin (HUC 03020201) (**Figure 1**).

## INTRODUCTION

Nutrient trading is currently being conducted under the auspices of several state programs, including the North Carolina Neuse River Nutrient Sensitive Waters Strategy. Wildlands has established a riparian buffer and nutrient bank, Little River Farm, to provide nutrient offsets under the North Carolina program. Little River Farm, as a case study, highlights some of the policy and market considerations crucial to making water quality markets work. Furthermore, other state and regional programs



**Figure 1: Service Area Map**

**Site characteristics.** Little River Farm consists of 28 acres of buffer along two unnamed tributaries to the Little River and two open field ditches of which 23.4 will be restored to a forested condition through planting of trees. The area originally consisted of open agricultural fields with no existing buffer and was farmed for cucumber, corn and soybean production. Buffer restoration involves removing invasive vegetation, altering current land use practices, and replanting native tree and shrub species within the 200 foot buffers.



**Figure 2: Conditions prior to restoration and planting**

It is anticipated that the project will generate 50,000 nitrogen credits over a five year period, which will be awarded in a staged credit release schedule.

## OFFSET PROGRAMS

**Considerations.** Making nutrient trading programs work both ecologically and economically requires a regulatory framework to provide market demand and ensure results at achieving the needed reductions.

Adequate regulations must exist to limit non-point and/or point source pollution to a level where developers must weigh the on-site development and land costs of reducing nutrients at the impact location with that of purchasing nutrient credits from an off-site, variable market nutrient bank. Likewise, limits must result in point source dischargers weighing the costs of reducing loading at the point source to other alternatives such as trading scenarios or purchasing nutrient credits from an approved bank. Adequate regulations that guarantee market demand reduce risk and incentivize broader participation from private landowners and entrepreneurs entering the market.

Policymakers interested in developing similar programs, along with the above regulatory requirements to foster a market, must consider:

- The appropriate suite of best management practices for generating the desired benefits and feasible market conditions.
- Requirements for site protection and/or the length of user agreements or term contracts.
- Nutrient load reduction calculations appropriate for the region and based on the best available science.
- Monitoring and reporting requirements.

## CONCLUSIONS

With the growing need to address nutrients in Georgia’s lakes and streams and the absence of a trading framework, nutrient offset programs should be considered as a potential solution for meeting the required load reductions.

Wildlands has developed a riparian buffer and nutrient bank in the Neuse basin to provide riparian buffer and nitrogen offsets that can serve as a case study of a market-based approach to water quality management. The first site, Little River Farm, was established this year under Wildlands’ Neuse Umbrella Banking Instrument.

## REFERENCES

Maloney, Karin A., Lynn A. Maguire, and E. Allan Lind. 2000. Neuse River Estuary Modeling and Monitoring Project stage 1: assessment of stakeholder interest and concerns to inform long-term modeling. Raleigh, NC: Water Resources Research Institute of the University of North Carolina.