# IMPLEMENTATION OF AGRICULTURAL BEST MANAGEMENT PRACTICES IN SUPPORT OF THE GERONIMO and ALLIGATOR CREEKS WATERSHED PROTECTION PLAN

FINAL REPORT
TSSWCB PROJECT #13-05

**COMAL-GUADALUPE SOIL AND WATER CONSERVATION DISTRICT #306**

FUNDING PROVIDED THROUGH A CLEAN WATER ACT §319(h) NONPOINT SOURCE GRANT FROM THE TEXAS STATE SOIL AND WATER CONSERVATION BOARD AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY

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# EXECUTIVE SUMMARY

The Comal-Guadalupe Soil and Water Conservation District #306 (SWCD), working cooperatively with the Texas State Soil and Water Conservation Board (TSSWCB) and the United States Department of Agriculture-Natural Resources Conservation Service (NRCS), Guadalupe and Comal County AgriLife Extension Service provided technical assistance and financial incentives to agricultural producers in the Geronimo and Alligator Creeks watershed.

A District Technician was hired and worked cooperatively with the TSSWCB, NRCS and AgriLife Extension to provide agricultural producers with the opportunity to voluntarily implement best management practices (BMPs) that would have a positive impact on the Geronimo and Alligator Creeks watershed.

Through this project, 6 water quality management plans (WQMPs) were developed and implemented on approximately 2,064.1 acres. The District Technician and TSSWCB worked with the SWCD and local producers to educate them on, the WQMP Program, proper soil sampling, and water quality. They also presented at field events, field days, and were active in the implementation of the Geronimo and Alligator Creeks Watershed Protection Plan (WPP).

Implementation of WQMPs has and will continue to be a key component in the overall effort to reduce the potential for nonpoint source pollution and improve water quality in the Geronimo and Alligator Creeks watershed.

# INTRODUCTION

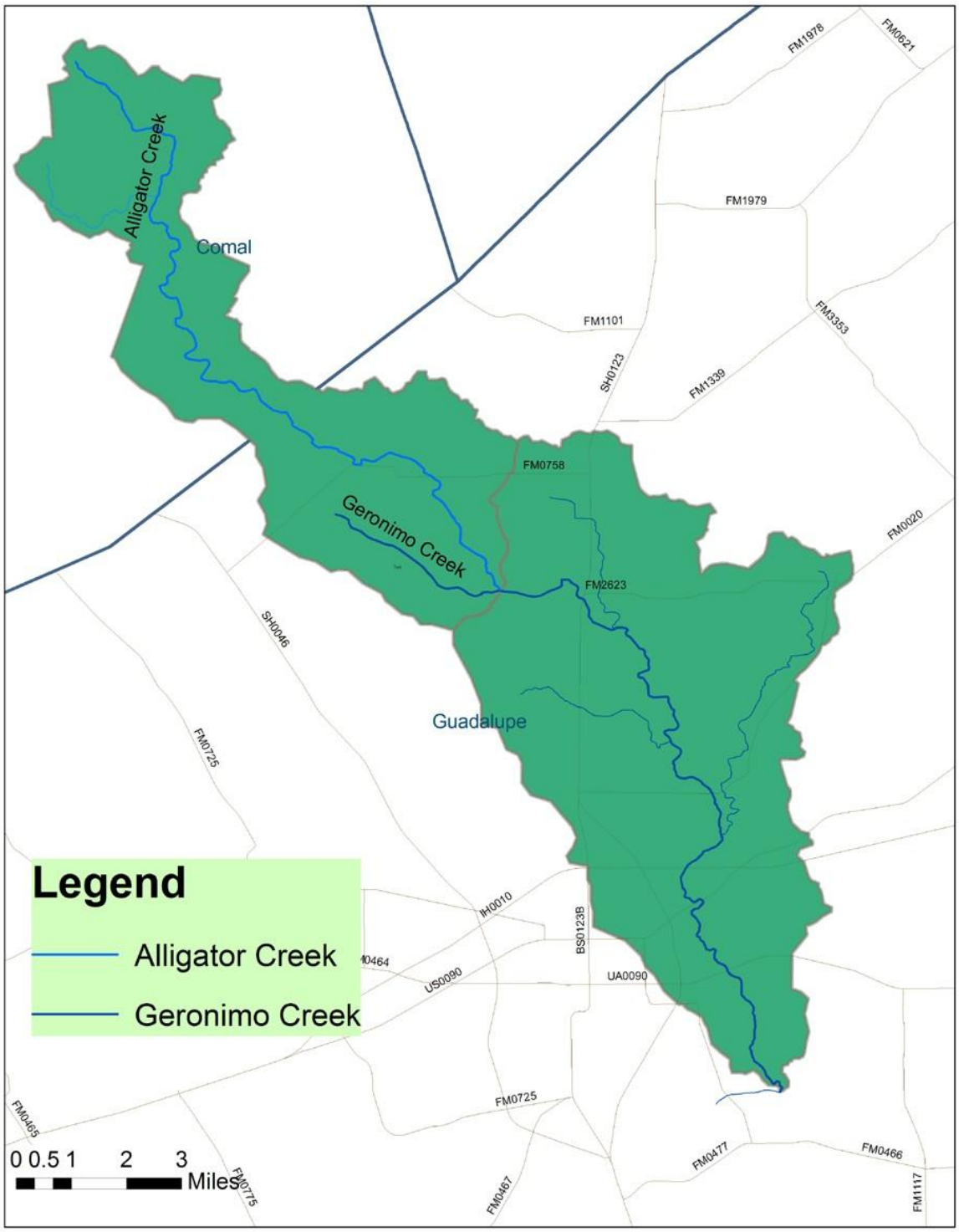
Geronimo Creek has been a vital part of growth and development in the area, due in part to its ability to maintain flow during even the most severe droughts on record. It served as a critical source of water to Native Americans and to early settlers as well. The land surrounding both Geronimo an Alligator Creeks provided excellent grazing and farming opportunities. In more recent years, the upper Alligator and lower Geronimo watersheds have undergone rapid, intense urban development. In 2008, Geronimo Creek was listed by the State of Texas as having *E. coli* bacteria levels that impaired contact recreation use of the stream, as well as having elevated nitrate-nitrogen levels. In response, the Geronimo and Alligator Creeks Watershed Protection Plan was developed using a stakeholder process driven by public participation to provide a foundation for restoring water quality in Geronimo and Alligator Creeks and their tributaries. By identifying key water quality issues in the Geronimo and Alligator Creeks Watershed and determining the factors contributing to these issues, management programs and public outreach efforts can be targeted to restore and protect the vital water resources of this watershed. The Geronimo and Alligator Creeks Watershed Protection Plan incorporates an analysis of existing water quality data and an investigation into potential pollutant sources based on local knowledge and experience to develop a strategy for addressing concerns related to water quality and watershed health.

Geronimo Creek and its tributary Alligator Creek are located in Comal and Guadalupe Counties. The almost 70-square-mile Geronimo Creek watershed lies within the larger Guadalupe River Basin. Alligator Creek begins on the west side of IH-35 and flows southeast through a rapidly developing area of the Austin-San Antonio corridor before its confluence with Geronimo Creek midway through the watershed. The upper portion of the watershed lies in the extra-territorial jurisdiction (ETJ) of New Braunfels, while the lower portion is in the ETJ of Seguin. As development and population growth continue, the conversion of rural land to urban land use will increasingly impact the hydrology and water quality in the watershed.

Through scientific analysis, researchers supporting the Partnership determined to what degree bacteria and nitrate-nitrogen levels in Geronimo and Alligator Creeks should be reduced to meet the water quality standard. Bacteria concentrations require a 26% reduction, while nitrate-nitrogen concentrations need to be reduced by 85%. Based on an evaluation of existing water quality data and watershed characteristics, the Work Groups recommended management measures needed to reduce bacteria and nitrate-nitrogen levels in Geronimo and Alligator Creeks. Key recommendations adopted by the Steering Committee include the following: The Urban Nonpoint Source Work Group focused on potential sources of bacteria and nitrate-nitrogen in existing urbanized areas of New Braunfels and Seguin, coupled with the plans for future growth and expansion. Dog waste and general urban storm water runoff were the two primary sources for which management measures were developed. City ordinances and pet waste collection facilities are proposed to address dog waste, which was identified as a significant potential pollutant source. An initial goal of the Partnership will be to support Seguin and New Braunfels in acquisition of funding to conduct detailed engineering analyses to properly locate and design storm water management practices specific to each city. In addition, New Braunfels will implement all the various required activities to manage storm water as part of their new Phase II storm water permit.

A WQMP is a site-specific plan developed through and approved by SWCDs for agricultural or silvicultural lands. The plan includes appropriate land treatment practices, production practices, management measures, technologies or combinations thereof. The purpose of WQMPs is to achieve a

level of pollution prevention or abatement determined by the TSSWCB, in consultation with local SWCDs, to be consistent with state water quality standards. This project was incorporated into the WPP in order to address the potential agricultural sources of NPS pollution and will be coordinated with educational and assessment activities planned within the Geronimo and Alligator Creeks watershed.



# PROGRAM DEVELOPMENT

This project consisted of the TSSWCB working with the Comal-Guadalupe SWCD #306 to provide technical assistance and financial incentives to landowners for the development, implementation, and/or maintenance of WQMPs. The goal of the Partnership was to develop and implement a Watershed Protection Plan (WPP) to improve and protect the water quality of Geronimo (Segment 1804A) and Alligator Creeks; Alligator Creek is a tributary to Geronimo Creek. According to the *2008, 2010, 2012 and 2014 Texas Water Quality Inventory and 303(d) List*, Geronimo Creek exhibits elevated nutrient levels and does not support the contact recreation use due to elevated bacteria concentrations.

The District Technician worked to compile a list of producers who were interested in the Water Quality Management Plan Program. The applications were then reviewed by the Comal-Guadalupe SWCD and given approval for implementation of cost effective pollution abatement practices based upon the recommendation stated in the Geronimo and Alligator Creek Watershed Protection Plan

The District Technician, working in cooperation with the NRCS, developed WQMPs based on the criteria outlined in the Field Office Technical Guide (FOTG), a publication of the NRCS. The FOTG represents the best available technology and is already tailored to meet the needs of SWCDs all over the nation. A WQMP includes the following:

- Conservation plan map showing boundaries, fields, land use, acres and facilities
- Soils map
- Soils description
- Topography map
- Conservation Plan of Operation
- Soil test (required when nutrients are applied)

Once the WQMP was developed and approved by NRCS and the local district, it was then sent to the TSSWCB Wharton Regional Office for technical review and certification. Upon certification of the WQMP, the plan could be implemented. The District Technician worked with the landowner to implement BMPs laid out in the WQMP. The major BMPs installed included:

Range Seeding (550) - Forage and Biomass Planting (512)
Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production. This practice applies to all lands suitable to the establishement of annual, biennial, or perennial species for forage or biomass production. This practice does not apply to the establishment of annually planted and harvested food, fiber, or oilseed crops.


Cross Fencing (382)
Locate fences to help facilitate management of different land uses and special management areas within land uses such as ecological sites, pasture types, riparian areas, critical eroding areas, etc. For domestic livestock, install fences in areas that will best facilitate the handling, feeding, watering and movement of the type of livestock managed.

Water Well (642) – Solar Pump (533) Water Storage Facility (614)
This practice is to be installed on land uses where a suitable aquifer is available. The water well will be drilled to provide drinking water for livestock, and must be drilled by a licensed water well driller.

Nutrient Management (590)
This practice manages the amount, source, placement, form, and timing of the application of plant nutrients and soil amendments.

Other BMPs installed were water well pumping plant (533), pipeline (516), pest management (595), prescribed grazing (528), forage harvest management (511) and brush management (314). The District Technician helped the landowner acquire any financial assistance available. The landowner was reimbursed once the practice was implemented and certified.

In addition to the development, installation, and maintenance of WQMPs, the District Technician and TSSWCB Wharton Regional Office worked with the SWCDs and local producers to educate them on their operation, the WQMP program, proper soil sampling, and water quality. The District Technician and TSSWCB Wharton Regional Office attended field days and educational events in the Geronimo and Alligator Creeks watershed disseminating information on this project and other agricultural related issues.

- Septic Tank Maintenance Workshop – 45 attendees
- Water Harvesting Workshop – 30 attendees
- Brush & Forage Management Conference – 70 attendees
- Annual Guadalupe Farm Bureau Conference – 150 attendees

# CONCLUSIONS

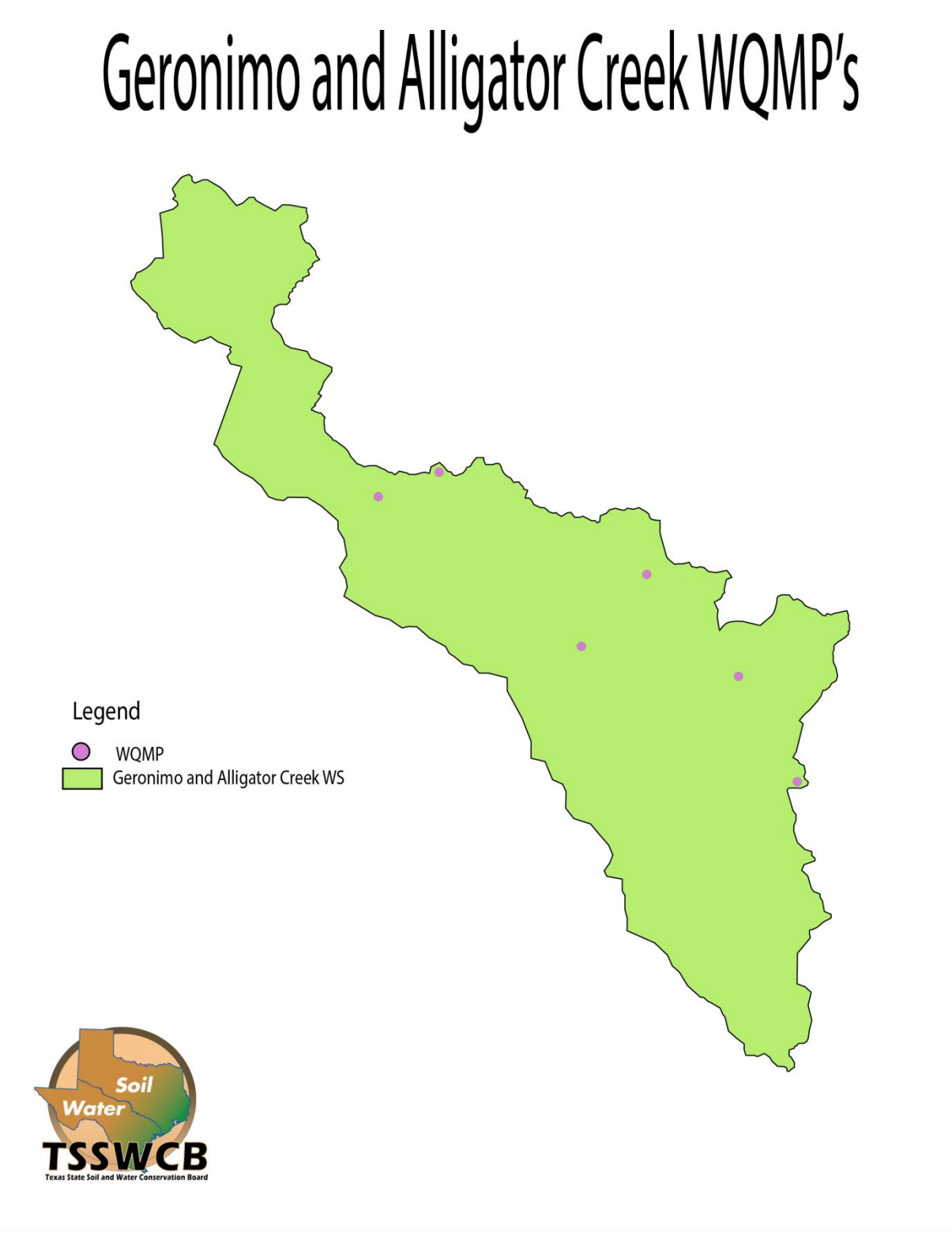
The development, installation, and maintenance of WQMPs in the Geronimo and Alligator Creeks watershed was and will strive to be a success. The District Technician, working cooperatively with the TSSWCB, AgriLife Extension and NRCS, provided agricultural producers with the opportunity to voluntarily implement BMPs that have a positive impact on the Geronimo and Alligator Creeks.

Through this project, a total of 6 WQMP were developed and implemented on approximately 2,064.1. On the majority of the 2,064.1 nutrient management, pest management, grazing management and brush management, were planned and initiated.

WQMP plans on cropland, rangeland and pastureland operations have implemented BMPs to achieve estimated bacteria and nutrient load reductions called for in the Geronimo and Alligator Creeks WPP. As such, there continues to exist a significant need for technical assistance and financial incentives to implement BMPs through WQMPs in order to achieve the goals in the WPP to restore water quality. These efforts will be continued through TSSWCB project 16-10 “Implementing Agricultural Nonpoint Source Components of the Geronimo and Alligator Creeks Watershed Protection Plan.

A local watershed coordinator funded through TSSWCB project 13-05, *Coordinating Implementation of the Geronimo and Alligator Creeks Watershed Protection Plan*, began work in the watershed in September of 2013. Since that time, monthly coordination meetings among the SWCD Technician, Extension personnel and the Geronimo and Alligator Creeks Watershed Coordinator have helped to quantify challenges and to propose additional opportunities for the development of WQMPs.

Appendix A


Geronimo and Alligator Creek WQMP's
Legend
WQMP
Geronimo and Alligator Creek WS
Soil
Water
TSSWCB
Texas State Soil and Water Conservation Board