



## The San Marcos Watershed Initiative

### Developing a Watershed Protection Plan

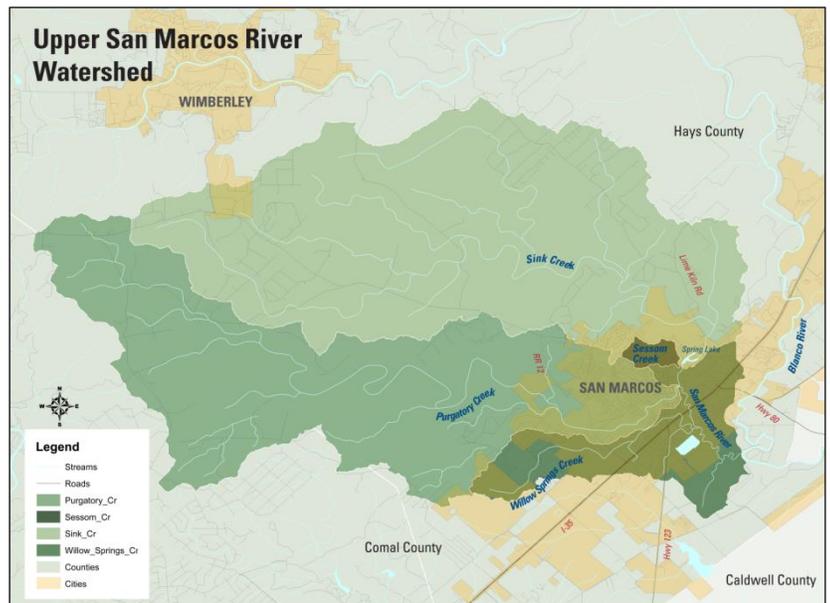
In 2010, the Upper San Marcos River was cited on Texas Commission on Environmental Quality's 303(d) list of impaired waterways, for exceeding total dissolved solids (TDS) water quality standards. TDS is the only pollutant that currently exceeds the Clean Water Act Standards but several other pollutants have been identified as a concern. Designated uses in the segment are Contact Recreation, Exceptional Aquatic Life Use, and Aquifer Protection which have water quality standards and screening levels set by the state. Because the Upper San Marcos River is spring fed and has exceptional water quality, stakeholders identified target levels that are more stringent than state standards and screening levels in order to protect the river.

The San Marcos Watershed Initiative (SMWI) began in 2012 as a multi-year process of research and information gathering with the end goal of implementing a community approved and federally accepted Watershed Protection Plan for the upper San Marcos River. The Meadows Center for Water and the Environment and SMWI Stakeholders compiled and collected relevant data, identified potential sources of nonpoint source pollution and modeled water quality for existing and predicted future land use conditions.

Using this information, best management practices (BMPs) were selected to be implemented over time to preserve water quality throughout the watershed including:

- Structural BMPs for new developments and retrofits for existing development
- Demonstration projects to encourage adoption of water quality protection practices
- Education and Outreach Strategies
- Non Structural Management Measures including land management strategies and preservation of undeveloped land
- Analysis and improvement of Codes & Regulations impacting water quality
- Information gathering and monitoring to address remaining data gaps

This effort will result in a comprehensive, voluntary and stakeholder-driven plan to manage





surface water resources in the upper San Marcos River watershed. The WPP will address the listed impairment (5c) for Total Dissolved Solids (TDS), as well as *E. coli*, nutrients, sediment and other pollutants associated with future growth and development.

## Implementing the WPP

Adverse effects on water quality resulting from urbanization and development within the upper San Marcos watershed already have been observed. The SMWI Stakeholders selected a suite of best management practices (BMPs) to mitigate current, as well as potential future water quality impairments in the watershed. A subset of the BMPs was prioritized for immediate implementation, while others will be implemented over a number of years, as required to mitigate nonpoint source pollution from future development and other activities in the watershed. The first Implementation Phase will include water quality monitoring, demonstration projects, BMPs, education and outreach activities, land conservation activities and improvements to water quality protection ordinances. Milestones will be used to track the WPP implementation progress in years 1 through 5.

BMPs installed during the Implementation phase will serve as demonstrations highlighting the effectiveness of BMPs to water resource managers, community leaders, developers and citizens. Demonstrations will include preventative, storm-water and low impact development (LID) measures. Educational signage, websites, materials and reports/documents will be coupled with these rainwater harvesting, rain garden, biofiltration, green channel conversion, green alley, detention pond, pervious pavement and walkway and other BMP demonstrations. Monitoring will assess the efficacy of these BMPs at removing pollutants.

During Implementation of the WPP, new and existing education and outreach efforts will be coordinated among the WPP and its partners – City of San Marcos, Hays County, Texas State University, The San Marcos River Foundation and many, many others. WPP efforts will be aligned with educational resources and activities associated with the regional Habitat Conservation Plan, City and University MS4 (multiple separate storm sewer system) and City Water Quality Protection Plan (WQPP) to ensure that preserving water quality in the upper San Marcos river is a common theme throughout the watershed. A multifaceted approach to education and outreach will serve to engage the community and key stakeholders in both the implementation of WPP activities and the expansion of pollution reduction strategies across the watershed. Specific activities include public service announcements, community workshops, speaker series, newsletters, watershed tours and other outreach efforts.

Non-structural management measures, including improved land management practices, riparian restoration and protection and preserving undeveloped lands also will be components implemented in the next five years. Outcomes include handbooks for City, County and University staff as well as private land owners to improve management of stormwater, riparian maintenance, mowing and vegetation clearing, grazing practices and other strategies to protect water quality. The preservation of undeveloped lands to increase water quality protection will be explored through the



development of a land conservation tool box and coordinated efforts to promote easements, purchases of important watershed lands and other approaches.

Because this is an increasingly urbanizing watershed, a review of existing ordinances will assist the City and County to quantify the effectiveness of ordinances pertaining to water quality and complete ongoing revisions of land development codes. Project partners and SMWI Stakeholders will work with city and county staff to interpret the findings of this comprehensive assessment and to entertain the incorporation of additional LID and green infrastructure components. A series of design workshop will be held with the development and engineering community for LID and green infrastructure application in new and re-development projects.

Monitoring and data collection undertaken during the course of this project will be used track water quality and better understand trending nonpoint source contributions to the river. Routine and continuous water quality monitoring data will be used to develop a baseline for tracking water quality and WPP progress. Groundwater data also will be collected to reduce gaps in knowledge, including the origins of TDS in ground and surface water. Water quality monitoring to assess efficacy of implemented BMPs also will be performed in the latter years of the first Implementation Phase.

## Benefits of the upper San Marcos Watershed Protection Plan

Implementation of the WPP will yield the following benefits to the community:

- Reduced nonpoint source pollution (NPS) and prevention increases in NPS in the future
- Demonstrated and proven best management practice options that improve water quality
- Site-specific retrofits for LID and green infrastructure
- Increased decision-making capacity to preserve water quality through local permitting, ordinances and regulations
- Additional methods to quantify water quality impacts through land management authorities
- Increased accuracy of tools available for decision makers to calculate effects of future land use changes and development activities on NPS loadings
- Additional data needed to adequately understand TDS origins in the springs and river
- Coordinated water resources and related environmental outreach/education efforts across the watershed
- Improved understanding of relationships between groundwater and source water, surface water, recharge, and vulnerability to impacts on water quality
- Significant funding from federal and state programs to implement water quality protection strategies