

# Coordinating Implementation of the Plum Creek Watershed Protection Plan

FINAL REPORT  
TSSWCB PROJECT #14-10



TEXAS STATE  

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Soil & Water  

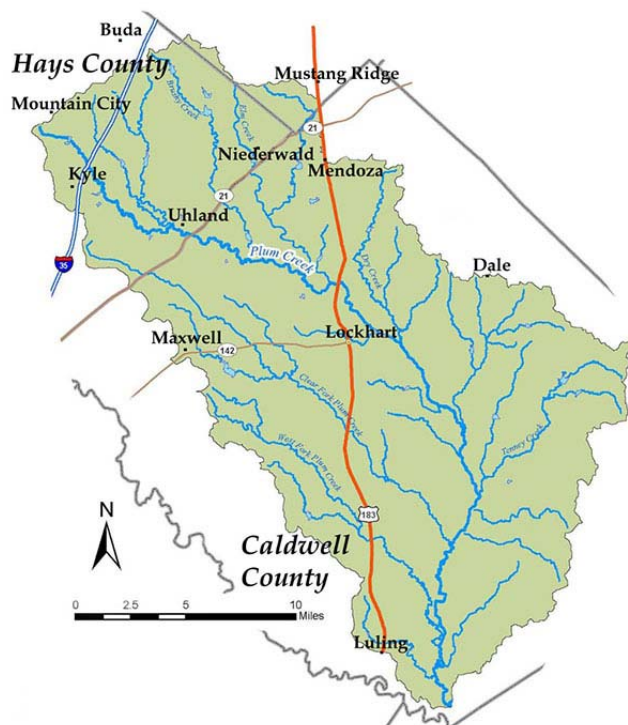
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CONSERVATION BOARD

Funding provided through a federal Clean Water Act §319(h) Grant from the Texas State Soil and Water Conservation Board and the U.S. Environmental Protection Agency

## INTRODUCTION

Plum Creek rises in Hays County north of Kyle and runs south through Caldwell County, passing Lockhart and Luling, eventually joining the San Marcos River at their confluence north of Gonzales County. Plum Creek is 52 miles in length and has a drainage area of 397 square miles (1,028 km<sup>2</sup>). In an effort to address nonpoint source pollution in Plum Creek, the Plum Creek Watershed Partnership (Partnership) began implementation of the Plum Creek Watershed Protection Plan (WPP) in February 2008. The WPP identified sources, implementation milestones and estimated financial costs for individual management measures and outreach and education activities. The plan also described the load reductions expected from the full implementation of all management measures.



The WPP serves as a stream restoration guidebook that relies on voluntary adoption of best management practices (BMPs) determined by watershed stakeholders to be most effective for achieving the water quality goals. Including the reduction of both bacteria and nutrient concentrations, the goals identified in the WPP are admittedly challenging and will require a long-term commitment from local watershed stakeholders to be realized. While the work continues, as of the date of this report, Plum Creek continues to be recognized by the State of Texas as impaired for Primary Contact Recreation. Nutrient levels remain a concern and *E. coli* levels in excess of 126 colony forming units per 100 milliliters (126cfu/100mL) persist throughout the creek.

Since implementation of the WPP began, the Plum Creek watershed has experienced some significant changes. The watershed has endured the most severe drought on record, at times resulting in all but those areas immediately below springs or effluent discharges running dry. Large swaths of the watershed have been transformed by the construction of State Highway 130 and rapid residential and commercial growth along the Interstate 35 Corridor. Rural land use characteristics have changed with a considerable increase in the number of small farms in both Hays and Caldwell County. The precipitous increase of reported feral hog activity throughout the watershed has further served to alter the landscape and pollutant loading characteristics. Understanding the new challenges posed by these transformative developments is essential for determining the proper adaptive management strategies to be implemented. Water quality restoration in a watershed as large and diverse as Plum Creek's will only be achieved through a coordinated, dynamic and sustained effort on the part of many watershed municipalities and citizen stakeholders.

The decision of the Partnership to transition primary WPP coordination from Texas A&M AgriLife Extension to an independent watershed coordinator in 2012 placed a greater emphasis on local control and may represent a paradigm shift in future WPP planning. In 2011, an Interlocal Agreement was signed by 12 project partners providing matching funds for TSSWCB Project #11-07, a CWA §319(h) grant to support a Plum Creek Watershed Coordinator (WC). This partnership continued to provide funding for TSSWCB Project #14-10. The presence of a local WC has enhanced stakeholder participation in watershed projects, as well as to better understand and respond to the evolving needs and interests of local communities.

The WC has worked with state and federal government agencies, research institutions, local municipalities, civic groups, businesses and non-profit organizations to bring technical and financial assistance to the watershed. The WC has continued to evaluate progress toward achieving milestones established by the Plum Creek WPP with updates and results regularly delivered to stakeholders and published the 2018 biennial addendum. The WC has organized numerous volunteer watershed cleanup efforts, developed programs and publications, managed the project website, utilized social media and established new lines of communication to promote watershed pollution prevention efforts.

Outreach and education (O&E) was identified by the Partnership as an integral component of the WPP and continues to serve as a key deliverable. Coordination of O&E efforts by the WC continues to facilitate and support public participation in the Plum Creek WPP. The WC regularly participates in local events and public meetings, has engaged stakeholders as the keynote speaker for more than a dozen local and statewide organizations, attends regional, state and national conferences, serves on local boards and committees, and has conducted, organized and/or secured the following O&E programs across the watershed:

- Youth and adult water resources educational programs
- Agricultural Field Days and Environmental Fairs
- Lone Star Healthy Streams (feral hog component)
- Smart Growth workshop

- Texas Watershed Stewards workshop
- Small Acreage Stewardship Workshop
- Conventional OSSF maintenance workshop for homeowners
- Aerobic system operation and maintenance workshops for homeowners
- Nonpoint Education for Municipal Officials (NEMO) workshop
- Texas Well Owner Network (TWON) workshop
- Texas Water Resources Institute (TWRI) Riparian Education Workshop and Urban Riparian & Stream Ecosystem workshop
- Low Impact Development and Green Storm water Infrastructure workshop

Additional funding through this CWA §319(h) grant, TSSWCB Project #14-10, continued implementation of the WPP and the WC position through 2019. Effective watershed management is neither a simple, predetermined series of steps or a “quick fix” that guarantees watershed improvement. Rather, it is a long-term commitment to stewardship of the natural resources that characterizes a watershed coupled with the adoption of BMPs that fit within the socioeconomic dynamics of the local communities.



**Volunteers at the 2018 Keep Lockhart Beautiful Clean-up**

## **SUPPORT AND FACILITATION OF WPP IMPLEMENTATION**

Objective: Facilitate continued stakeholder involvement in the PCWP to ensure successful implementation of the Plum Creek WPP and track implementation.

GBRA, in coordination with the PCWP, hired a WC in March 2012 to engage and facilitate the PCWP and entities identified in the Plum Creek WPP. In August 2018, a new WC was hired. The WC is stationed in Lockhart, TX and has served as the primary conduit for interaction with landowners, citizens, and entities to facilitate the implementation of the WPP. The new WC completed the Texas Watershed Planning Short Course in February 2019 and has participated and/or delivered presentations at Texas Watershed Coordinator Roundtables and the TSSWCB Southeast and South Central Texas Regional Watershed Coordination Steering Committee meetings. The WC participated in professional development activities such as trainings, conferences and workshops. Highlights include:

- ESRI, Advanced User – Online Training (2015)
- Texas Watershed Coordinator Roundtable, San Marcos, TX (2015)
- Grant Writing USA, Grant Writer Training – San Antonio, TX (2015)
- SESCWCSC Meeting, Columbus - TX (2015)
- TWDB Financial Assistance Workshop – Austin, TX (2016)
- Texas Watershed Coordinator Roundtable – College Station, TX (2016)
- Soil Health Conference – Ardmore, OK (2016)
- Texas Watershed Coordinator Roundtable, College Station, TX (2017) Texas Watershed
- A&M Agrilife Small Acreage Steward Workshop – Lockhart, TX (2018)
- Low Impact Development Workshop – Seguin TX (2018)
- Implementing Watershed Plans Training – College Station (2018)
- Health Watershed Consortium Webinar – Online Training (2018)
- Texas Regional Stormwater Conference – New Braunfels, TX (2018)
- Texas Watershed Coordinator Roundtable – College Station, TX (2019)
- Texas Watershed Planning Short Course – Bandera, TX (2019)
- Grant Writing 101, Grant Writer Training – Austin, TX (2019)

The WC has assisted governmental and non-governmental organizations in the Plum Creek watershed, in identification and acquisition of resources (financial and technical) to enable WPP implementation. The WC has actively pursued funding opportunities and worked with partners to develop grant proposals which have resulted in approximately \$1,715,000 in grants and local funding for Plum Creek watershed projects.

<b>Primary Funding Partner(s)</b>	<b>Description</b>	<b>Funding*</b>
CAPCOG, Caldwell County	Caldwell County Community Collection Events (2012-18)	\$91,000

Texas Water Development Board, City of Buda, Hays County	Clean Water SRF low-interest and loan forgiveness program to fund planning and design for Hillside Terrace septic-to-sewer project (2013-15)	\$400,000
Local businesses and organizations	Keep Lockhart Beautiful – Plum Creek Watershed Cleanup and Environmental Fair (2014 -2019)	\$16,000
Keep Texas Beautiful, HEB	Texas Waterways Cleanup Grant (2014 and 2019)	\$1,000
HEB	Corporate grant to benefit Keep Lockhart Beautiful programs (2014)	\$2,000
Keep Texas Beautiful, TxDOT	2015, 2016, and 2017 Governor’s Community Achievement Award recipient – Annual award to 10 Texas communities with the best grassroots environmental and community beautification programs	\$160,000
Texas Department of Agriculture, Hays County, Caldwell County, local businesses, organizations and landowners	Feral hog abatement programs for Caldwell and Hays County: \$20,000 CHAMP Grant (2014-19); \$25,000 CHOMP (2015-16); \$90,000 additional local funding (2014-19)	\$150,000
TCEQ, Caldwell County, GBRA,	Plum Creek WPP Implementation of Low Impact Development (LID) for the Caldwell County Justice Center (2015-19)	\$370,000
GBRA, TSSWCB, Texas A&M Dept. of Soil and Crop Sciences	Bacterial Source Tracking to Support the Implementation of the Plum Creek WPP	\$10,300

### **Feral Hogs**

Due to a strong desire for more assistance for feral hog management by local stakeholders, the WC coordinated efforts of watershed landowners and Caldwell County Commissioners to found

the Caldwell County Feral Hog Task Force in early 2013. The Task Force developed a *Feral Hog Action Plan* based on the stakeholder-led concepts embodied by the Plum Creek WPP. The Task Force has achieved tremendous funding and support for its 'landowner cooperative' programs, which include aerial control, professional contractors, "smart" traps and a bounty program. Working in concert with partners in Hays County, the early results are extremely encouraging with more than 14,100 feral hogs removed as a direct result of Task Force programs from September 2012 through April 2019. As a result of its early success and proactive approach, the Task Force has received state and national attention. Media coverage has included features in publications such as Texas Coop Power, Lonestar Outdoor News, the Austin-American Statesman and *The Economist*. Task Force efforts have extended to radio and television programs, including evening news programs throughout Texas, nationally syndicated cable television news and Animal Planet. The WC continues to work with Caldwell County in management of the County Hog Abatement Match Program, and to ensure future CHAMP participation as a part of the implementation of the Plum Creek WPP.



#### **Low Impact Development at Caldwell County Justice Center**

Responding to Caldwell County budget shortfalls for landscaping and additional parking infrastructure to accompany a major building renovation that would become the County's new Justice Center, the Partnership worked with the County Judge and Commissioners to develop a CWA §319(h) grant proposal through the TCEQ to retrofit the facility with LID components, including raingardens, xeriscape, rainwater harvesting and the construction of a permeable paver parking lot. The \$370,402 project included significant local investment and drew on existing partnerships with Caldwell County AgriLife Extension and Keep Lockhart Beautiful, among others, to provide matching and in-kind funds. The project was selected for funding and executed in November 2015. The Caldwell County Justice Center project, which will include highly visible BMPs along with enhanced education and outreach efforts, serves as a prime example of one Partnership community's vision and leadership in Plum Creek WPP implementation.

As of December 31, 2017, Caldwell County has completed work on its 10,000 gallon rainwater harvesting system for the Justice Center rooftop runoff (figures 3 and 4), a rain garden across the front of the parking lot with treatment capacity for 13,000 gallons of runoff (figures 5 and 6) and 2,000 square feet of xeriscaping has been completed. A new 13,000 square foot permeable paver parking lot with 36 parking spaces is still in the planning stages. The County has offered one workshop and one site tour.





**Above: 10,000 Gallon Rain Water Harvesting System at Caldwell County Justice Center**



**Above: Completed Rain Garden at the Caldwell County Justice Center**

### **Low Impact Development at City of Kyle WWTP**

Following Caldwell County's success, the City of Kyle worked with the Partnership throughout 2015 to develop a new CWA §319(h) grant proposal to both demonstrate improved water quality in Plum Creek through LID BMPs and encourage adoption of more LID in booming communities along the IH-35 corridor. The \$220,368 project to construct green stormwater infrastructure at the City's new administration building for its planned WWTP expansion was



selected by TCEQ for EPA review in December 2015 and subsequently funded. TCEQ has approved the design of the LID features for the WWTP. However, since it is a portion of a major construction project at the WWTP, construction of the LID features is pending completion of a design review and revision for the overall WWTP project.

The WC has evaluated and tracked progress toward achieving milestones established in the WPP; assessed water quality data collected through the Clean Rivers Program, TSSWCB projects 14-11, 17-58, 17-09, and other data collection efforts in relation to achieving load reductions; and will distribute to stakeholders a biennial addendum to the Plum Creek WPP. The WC has communicated with TSSWCB and TCEQ to periodically provide information to EPA to support the *Rationale for Reclassifying Plum Creek (Segment 1810) from Category 5 to Category 4b on the 2014 Texas Integrated Report* and as modified in subsequent Integrated Reports. The 2018 biennial addendum to The Plum Creek WPP was completed September 2018. This addendum received a high rate of feedback from stakeholders, enabling the Partnership to address specific local needs and concerns.

#### Bacterial Source Tracking Study

As part of an adaptive management approach embraced by stakeholders and as directed by the Plum Creek WPP a Bacterial Source Tracking Study for the watershed completed in 2017 with information transferred to watershed stakeholders by GBRA and the PCWC in 2018. The Bacterial Source Tracking Study Final Results were communicated to the Steering Committee on February 12, 2019 in Umland, TX generating much discussion regarding resource allocation and local opportunities to capitalize on report findings. The Steering Committee expressed interest in the continuation and possible intensification of feral hog eradication, the growing number of small acreage farming operations, and the acquisition of more WQMPs in sub watersheds LU-1, LU-2, LU-3, and LU-4 to mitigate bacterial loads from ranching operations in the watershed's southern reaches. It is important to note that the results to this study are accessible to the general public on Plum Creek's webpage that is hosted by GBRA ([plumcreekwatershed.org](http://plumcreekwatershed.org)). This allows individuals from local communities within the watershed not only to be better informed of the sources of bacteria that are present, but also provides the potential for BMP implementation to be specifically tailored to meet concerns expressed in the BST results on a sub-watershed scale. The BST analysis will allow the Partnership to develop more targeted strategies to address bacteria loading from nonpoint source pollution.

GBRA and the WC have facilitated public participation and stakeholder involvement in the watershed planning process, specifically by hosting quarterly meetings of the Partnership Steering Committee to provide regular updates on progress to implement the WPP and seek input and recommendations on needed activities. Partnership meeting topics generally cover a wide array of subjects including wildlife management, social aspects of watershed management, managing small acreage tracts for protecting water quality, the waste water treatment process, non-point source pollution mitigation, general discussions regarding Plum Creek's impairment between steering committee members and community stakeholders and

more. GBRA and the WC have coordinated meetings, secured meeting locations, prepared and disseminated meeting notices and agendas. Meeting summaries have been prepared and posted to the project website with a typical rate of over 50 website hits per entry.

Partnership meeting attendance has continued with public meetings ranging from 30 to 50 attendees since 2012 and remain strong in 2019. The Partnership Steering Committee voted in 2014 to rotate public stakeholder meetings (2 per year) and non-advertised business meetings of the Steering Committee (2 per year). The Partnership enjoys numerous collaborative relationships with many local entities and individuals that ensure the procurement of meeting venues and sponsorships. These collaboratives enhance the Partnership's ability to maintain a watershed-wide presence. As of 2019, the Partnership remains united and steadfast in their mission to restore and protect the water quality of Plum Creek.



**Plum Creek Partnership Meeting: 2017**

GBRA and the WC have maintained a database of watershed stakeholders and affected parties for use in engaging the public in the watershed planning process. The stakeholder group will be added to based upon previous efforts of Extension in TSSWCB projects 04-17 and 08-07.

The current phone and email database contain 1,264 stakeholders who continue to receive direct communication from the WC regarding Plum Creek watershed activities. The database has grown over 300% since 2014 and continues to acquire more contacts.

GBRA and the WC have attended, participated and provided periodic presentations in public meetings to communicate project goals, activities and accomplishments to affected parties. Such meetings have included (# of meetings attended):

- Commissioner's Court – Hays County (7), Caldwell County (16)
- City Councils – Buda (3), Kyle (3), Uhland (3), Lockhart (5), Luling (3)
- Project Partner Board Meetings - GBRA (4), Plum Creek Conservation District (6), Polonia Water Supply (2), Hays County SWCD (6), Caldwell-Travis County SWCD (5)
- Clean Rivers Program Basin Steering Committee and Coordinated Monitoring (9)
- Caldwell County Feral Hog Task Force (10)
- Keep Lockhart Beautiful Board / Downtown Revitalization Committee (18)
- Caldwell County Farm Bureau (3)
- TCEQ public meetings regarding critical discharge and construction permits in the watershed (4)
- Kinder-Morgan Permian Highway Pipeline Open House - Hays (1), Caldwell (1)
- **Featured speaker/presenter:**
  - Texas Master Naturalist – Hays County
  - Texas Master Naturalist – Lost Pines
  - Texas Master Naturalist – Guadalupe County
  - Texas Independent Cattlemen's Assoc. – Mid Tex (2014)
  - Texas Independent Cattlemen's Assoc. – Guada-Coma
  - Houston Galveston Area Council of Government
  - Caldwell County Farm Bureau Annual Meeting
  - Texas Water Utilities Assoc. – Guadalupe Valley (2014)
  - Texas Invasive Species Coordinating Committee
  - Texas Rivers Protection Assoc.
  - TSSWCB Southeast and Southcentral Texas Watershed Coordinator Steering Committee (2014)
  - Lockhart Kiwanis
  - Operation Dustoff Aerial Pest Eradication Landowner Meeting
  - Caldwell County Feral Hog Task Force Veterans' Day Salute
  - Tri-Community Wildlife Management Assoc.
  - Clear Fork Wildlife Management Assoc.
  - Bastrop-Caldwell Wildlife Management Assoc.
  - Texas Regional Stormwater Conference – New Braunfels, TX (2019)
  - Capitol Area Environmental Task Force meeting - Uhland, TX (2019)

## **OUTREACH, EDUCATION AND COMMUNITY SUPPORT**

Objective: Promote involvement, provide information transfer and encourage participation in the Plum Creek Watershed Partnership.

The WC has coordinated and conducted water resources and related environmental outreach/education efforts across the watershed, as identified in the Plum Creek WPP. GBRA and the WC have worked with collaborating entities to organize the following training programs:

**Lone Star Healthy Streams (feral hog component) – 3 events**

The Partnership organized 3 Lone Star Healthy Streams (LSHS) workshops encompassed in this reporting period with 103 attendees in 2014 (Kyle), 112 attendees in 2015 (Luling), and 117 attendees in 2016 (Luling). The LSHS program focus is on bacterial runoff management from beef cattle, dairy cattle, horses, poultry, and feral hogs. As part of this educational program, current best management practices (BMPs) and novel BMPs are being evaluated to provide important information to citizens regarding BMP effectiveness relative to implementation costs and load reduction.

**Conventional OSSF maintenance workshop for homeowners – 1 event**

The Partnership organized one conventional OSSF maintenance workshop for homeowners in 2017 (Kyle) that was attended by 38 individuals. This course covers the components of a conventional septic system and drainfield. Presentations provide a basic understanding of the operational and maintenance activities for a conventional septic system. The course explains how activities within the home can impact the operation of a septic system.

**Aerobic system operation and maintenance workshops for homeowners – 2 events**

The partnership organized two aerobic system operation and maintenance workshops for home owners with 10 attendees in 2014 (Lockhart) and 19 attendees in 2017 (San Marcos). Directed at homeowners, these workshops provide a basic training in proper evaluation of structures, equipment and operation of already installed aerobic septic systems in homes. A certificate of attendance is provided.

**Local Community Cleanups**

The Keep Lockhart Beautiful, Plum Creek Watershed Cleanup attracted more than 200 youth and adult volunteers annually from 2014 through 2018. The WC has assumed primary coordination responsibility for this event from 2013 - 2018. Local funding for the event has increased 300% since 2014. The event takes place throughout multiple Lockhart City Parks each autumn and is accompanied by an Environmental Fair that informs the attending youth about the basics of NPS pollution. After receiving 2nd Place in the statewide competition for their efforts in 2013, KLB buckled down in 2014 to win the KTB Governor's Community Achievement Award for the City of Lockhart. Along with the award, the City of Lockhart received a \$160,000 grant from TxDOT to construct a landscaping project in the City.



**Above: The 10<sup>th</sup> Annual Keep Lockhart Beautiful Trash Cleanup and Environmental Fair (2017)**

The Kyle Plum Creek Watershed Cleanup was held annually at Lake Kyle each February by the Kyle Parks and Recreation Department. Results include: the 2015 event was cancelled due to inclement weather; 2016 – (data unavailable); 2017 – (14,200 lbs. of refuse); 2018 – (75,440 lbs. of refuse)

Thirteen Caldwell County Community Collection Events were funded by Caldwell County and CAPCOG grants received in 2012 and 2014. The events reduce illegal dumping by providing county residents the opportunity to dispose of non-hazardous solid waste at no charge. Many of these events have also included a tire recycling program. Final results for the 2014 - 2017 events totaled over 115 tons of solid waste received from 605 participants containing over 3,400 tires.

Hays County Community Collection Events funded by Hays County and CAPCOG grants netted over 23 tons of solid waste materials in 2017.

Household Hazardous Waste Collection Events funded by the City of Lockhart and CAPCOG were held in Lockhart from 2014 through 2019. HHW and hazardous paint collected at these events in 2014 – 2019 totaled over 18 tons from 290 households.





**Above: Hays Community Collection Event in 2017 showing a portion of the 23 tons of solid waste collected**

#### **Texas Watershed Steward Program**

One Texas Watershed Steward workshop was held in Lockhart (2015). This program provides watershed education to help citizens identify and take action to address local water quality impairments. Texas Watershed Stewards learn about the nature and function of watersheds, potential impairments, and strategies for watershed protection.

#### **Riparian Management**

The Partnership organized 3 riparian workshops as part of overall Plum Creek WPP implementation in 2016 and 2017. Both Urban Riparian workshops included classroom education and field evaluation of an urban stream, Town Branch in the City of Lockhart and Steeplechase Park in the City of Kyle.

#### **Rainwater harvesting**

A Smart Growth workshop held in Lockhart in 2017 was attended by 10 individuals that contained a rainwater harvesting component.

#### **Texas Well Owner Network (TWON) training / well screening**

In May 2013, the TWON program offered a free, one-day educational training for Plum Creek watershed stakeholders. The training, which included a presentation from the WC, focused primarily on water quality issues in the Plum Creek watershed as well as efforts by the Partnership, TWRI and the TSSWCB to improve water resources in the area. Well owners were allowed to bring water samples to the training to be screened for nitrate nitrogen (NO<sub>3</sub>-N), total dissolved solids and arsenic. The GBRA Regional Laboratory also provided testing for *E. coli* bacteria for \$10 per sample. Thirty-seven people attended the workshop with the reported value of this program to attendees estimated at \$647.97 per participant with some individuals estimating up to \$2,500. Total savings for all participants was an estimated \$23,975.

**Texas Stream Team volunteer monitoring trainings**

Held regularly in San Marcos

**Lone Star Healthy Streams (grazing cattle component)**

Two workshops were held in Caldwell County in 2014 with 103 attendees and 2015 with 112 attendees.

**Low Impact Development Workshops**

Rapid urban development continues through the Plum Creek watershed increasing the priority of stormwater management. Through a CWA §319(h) grant with TCEQ two workshops were hosted in Lockhart addressing the wide variety of practices, design, installation and benefits of green infrastructure or low impact development. Two workshops in Lockhart were hosted in June and November of 2017. The workshop in November was unique in that a hands-on/tour of the installation of the rainwater harvesting collection system at the Caldwell County Justice Center was part of the agenda.

The WC gave presentations on the PCWP, WPP and general nonpoint source pollution information the Following local schools and community organizations.

- Navarro Elementary (Lockhart) Water Fair (2014-2018)
- Caldwell County 4-H Camp
- St. Stephen's Episcopal School Earth Day Booth
- TPWD Elementary School Field Trips – Lockhart, TX (2018-2019)
- Plum Creek Elementary School Career Day
- Chisholm Trail Roundup Natural Resources Fair (2012-16)
- Big Red Barn Youth Ag Fair (2012-14)
- Three Caldwell County and Hays County Feral Hog Education Workshops coordinated by the WC from 2014 - 2018 were attended by approximately 100 individuals. Presenters included the WC, TPWD and AgriLife Extension.
- An “in-class” feral hog education program for high school agriculture science students in Lockhart and Luling was developed and delivered by the WC in November 2014. A total of 301 students received 1 hour of education on feral hog management and the Plum Creek WPP.

The WC worked with Extension (County Agents) to coordinate annual soil testing campaigns targeting fertilizer users (agricultural and urban) in Hays and Caldwell Counties. During the reporting period, annual soil testing campaigns have been conducted by the Caldwell-Travis Soil and Water Conservation District. TSSWCB and EPA provided grant funding through a CWA Section 319(h) grant to pay for almost 70 soil samples in the watershed from 2014-2017. This management practice has not only provided environmental benefits by reducing nutrient loading to the soil and potentially to water resources, but also created the opportunity for an economic impact.

GBRA and the WC worked to support, promote, and participate in, as appropriate, numerous field days, demonstrations, site tours, and education events sponsored by Extension, NRCS, and/or SWCDs for the Plum Creek watershed.

GBRA and the WC worked with the TAMU Spatial Sciences Laboratory to continue to host and maintain the PCWP website (<http://plumcreek.tamu.edu>) to serve as a public clearinghouse for all project- and watershed-related information. Presentations, documents and results have been posted to this website. The website serves as a means to disseminate information to stakeholders and the general public. With an average of 12.5 new viewers every day, the number of unique visitors to the Partnership website has more than doubled since 2014, bringing the total number of unique visitors to over 30,000 since the site's initial launch in 2006.

GBRA and the WC have facilitated communication with stakeholders in order to engage the public and affected entities in the watershed planning process. GBRA and the WC have utilized all appropriate communication mechanisms including direct mail, e-mail, the project website, and mass media (print, radio, television). GBRA and the WC have developed and disseminated general project informational materials, including flyers, brochures, letters, factsheets, news releases, and other appropriate promotional publications. GBRA has included information about the project in the GBRA *River Run* and Clean Rivers Program publications. While a listserv to facilitate direct discussion between stakeholders was not created, the expansive contact database developed by the WC has served this purpose well. GBRA and the WC have made appropriate use of social media, particularly Facebook, as a stakeholder communication mechanism for the watershed. The Partnership's social media presence has increased exponentially with over 2,000% increase in organic engagements since the initial creation of the Facebook page. Facebook likes have grown from under 100 in 2014 to over 230 likes in 2019. It was determined by the TSSWCB and Partnership Steering Committee that project updates provided via email by the WC would sufficiently serve to accomplish the GBRA deliverable to develop, publish, and distribute 6 semi-annual newsletters that highlight Plum Creek watershed activities. The TSSWCB has approved all project-related content in any informational materials and promotional publications prior to distribution.

## **CONCLUSIONS**

Over the course of TSSWCB Project #14-10, the PCWP has effectively increased water quality awareness in urban neighborhoods and rural communities throughout the Plum Creek watershed and beyond. The PCWP has remained actively engaged in Plum Creek WPP implementation, hiring a local WC and playing a significant role in securing over \$1.7 million in local, state and national investment in watershed projects since 2012.

The WC has actively promoted Plum Creek WPP implementation, coordinated the Partnership, continued to build and strengthen local partnerships, and has sought external grants to facilitate implementation activities and provide the balance of funds needed to sustain the position. At meetings held during the summer of 2013, the 12 original participating entities in the Interlocal Agreement, decided to again provide the 40% local match required for a TSSWCB CWA §319(h) implementation grant that currently support local facilitation of the Partnership and the Plum

Creek WPP. These efforts have been guided by the understanding that watershed management programs should strive to transition dependency on federal support to local sponsorship. Plum Creek is the first watershed in Texas to solidify, through an interlocal agreement, local, governmental entities' commitment to jointly fund a WC for the mutual benefit of all the entities involved.

Due to a combination of tremendous population growth, land use changes, erratic weather patterns, and spills in the upper watershed, *E. coli* concentrations at the CRP monitoring station near Luling (Plum Creek above confluence with the San Marcos River) have increased. The rolling 7-year geometric mean for *E. coli* measured between 2011 and 2018 in Luling was 275 cfu/100mL, a 41% increase from levels measured over the 7-year period between 2003 and 2010. Large swaths of the watershed have been transformed by the construction of State Highway 130, which opened October 24, 2012. Further, rapid residential and commercial growth along the Interstate 35 Corridor between Austin and San Antonio continues to pose substantial challenges to the water quality in Plum Creek. The City of Kyle, in particular, experienced exponential population growth (427%) from 2000 to 2010 as defined by the U.S. Census Bureau and is rising rapidly. As small towns struggle with becoming urbanized centers, the impacts to existing stormwater and wastewater systems can be profound, greatly increasing the risk of significant water quality degradation. This is a strong testament to the colossal impact that rapid changes in land use along with booming population growth can have on our river systems, highlighting the need for additional BMP implementation and the continuation of efforts put forth by the Plum Creek Watershed Partnership.

## **NEXT STEPS**

The Plum Creek Watershed Partnership began implementation of the Plum Creek Watershed Protection Plan in February 2008, and despite major changes within the watershed, with rapid development, years of drought, and employee turnover at the city and county level, the Partnership continues to be actively engaged in implementation activities. Enthusiasm for continued implementation is evident with the increasing number of new projects within the watershed including LID implementation in Caldwell County and the City of Kyle, as well as the riparian restoration project in Lockhart. The PCWP will continue its diligent support of watershed stakeholders and work to effectively communicate the value of Plum Creek WPP implementation. The funding for *"Plum Creek WPP Implementation of Low Impact Development for Caldwell County Justice Center"* is representative of a future vision for the Plum Creek watershed. This project leverages local investment with substantial CWA §319 funds to demonstrate a large suite of BMPs designed to both conserve water and reduce the impacts urban stormwater runoff. Wide adoption of LID and a focus on sustainable development will be integral to the long-term success of water quality restoration in Plum Creek.

The PCWP will continue to host workshops that bring industry professionals together with local citizens. Smart growth workshops and school tours funded by CWA §319 grants from the TCEQ will highlight the value of LID for small, residential lots to large-scale applications. Riparian workshops will provide expert insight and hands-on training to rural land managers and municipal officials. OSSF training, the Texas Watershed Steward program, feral hog workshops and others

will reach new watershed stakeholders and provide continuing education for local citizens already involved in PCWP-supported programs. GBRA is deeply committed to educating local youth about the importance of water quality and has been a valuable resource for the PCWP in this area. The PCWP plans to strengthen and enhance its presence in local schools as it works with GBRA to deliver impactful educational experiences.

Additional efforts of the PCWP will include illicit dumpsite cleanups and fundraising for other projects to reduce illegal dumping in the Plum Creek watershed; coordinating community cleanups and environmental fairs; working with the TSSWCB, USDA-NRCS and local landowners to enhance the adoption of programs like WQMPs and EQIP; and working with local government and business leaders to develop a sustainable development plan for the Plum Creek watershed. In addition to new projects, continued commitment from the Partnership will ensure that critical components of the WPP will continue to be implemented. The Guadalupe Blanco River Authority will continue water quality monitoring in the watershed through a CWA Section 319(h) grant from the TSSWCB and EPA that provides funding for monitoring through September of 2019. Caldwell-Travis Soil and Water Conservation District has committed to continue implementing agricultural components of the WPP by providing technical assistance to farmers and ranchers. The project, funded through a CWA Section 319(h) grant from TSSWCB and EPA will also continue to provide financial assistance to implement agricultural BMPs through October of 2019.