

10. Project Implementation

This section outlines needed technical assistance, a schedule for implementation of the recommended management measures, an estimate of the associated costs, potential sources of funding, and an estimate of load reductions expected as a result of program implementation.

TECHNICAL ASSISTANCE

Successful implementation of the Plum Creek Watershed Protection Plan relies on active engagement of local stakeholders, but also will require support and assistance from a variety of other sources. The technical expertise, equipment, and manpower required for many management measures are beyond the capacity of Plum Creek stakeholders alone. As a result, direct support from one or a combination of several entities will be essential to achieve water quality goals in the watershed. Focused and continued implementation of key restoration measures will require the creation of multiple full-time equivalent positions in the watershed to coordinate and provide technical assistance to stakeholders.

Urban Stormwater and Wastewater Management Measures

Structural and programmatic urban stormwater controls are the responsibility of individual cities in the watershed. However, identification and design of specific improvements to stormwater conveyances and wastewater treatment facilities are beyond the scope of many smaller municipal operations. Professional engineering analysis will be essential to assess construction of new structural controls and upgrades to existing components of both stormwater and wastewater facilities. Funding will be sought to support these engineering evaluations for Kyle, Lockhart and Luling. Installation of pet waste collection stations in each of the major communities, in combination with street sweeping programs, construction of recommended structural stormwater controls, and construction of wastewater facility upgrades along with enhanced monitoring and management procedures will enable the achievement of target pollutant load reductions. Throughout this process, the continued assistance and commitment of city officials, staff, and facility permittees and operators will be critically important to the implementation of recommended management measures.

Septic System Management Measures

Site-specific evaluations will be necessary to determine whether existing septic systems are operating effectively, or whether they require maintenance, repair, or complete replacement. To support and facilitate this effort, particularly in Caldwell County where staff is limited, a new position will be created to focus on septic system inspection and enforcement in the watershed. The position will work in cooperation with independent contractors and in support of existing programs in Caldwell and Hays Counties. Based on preliminary cost estimates, performing needed repairs, replacement or connection of failed septic systems to centralized wastewater treatment facilities will be a multimillion

dollar effort. These estimates of needed funding will be adjusted, as appropriate, as the inspection program is implemented and a more complete understanding of potential contributions and needed management measures for these systems is developed. In addition, management targets will be adjusted over time based on field assessments by staff and results of ongoing water quality monitoring efforts in the watershed.

Agricultural Management Measures

Technical support from SWCD and NRCS personnel is critical to selection and placement of appropriate management measures on individual agricultural properties. However, due to the number of management plans that will be needed a new position dedicated specifically to WQMP development in the watershed will be necessary. Targets for the number of livestock and cropland WQMPs to be developed will be adjusted as the plan implementation process moves forward. Assistance from local Extension agents, other agency representatives, and landowners already participating will be relied upon to identify and engage key potential agricultural producers. The duration of the position will be dictated by demand for enhanced technical assistance, assuming water quality monitoring results indicate the need for continued improvement.

Non-Domestic Animal and Wildlife Management Measures

Management of the feral hog control program will be coordinated through TWDMS, with a new staff position housed in the watershed. Animal number targets will be used as an initial measure of program effectiveness. In addition, hog surveys and supplemental wildlife assessments will be utilized to better define the extent and distribution of the problem and to direct control efforts.

SCHEDULE, MILESTONES, AND ESTIMATED COSTS

The implementation schedule, milestones, and estimated costs of implementation, presented in Table 10.1, are the result of planning efforts of the Steering Committee and work groups, in coordination with county and city officials, and other watershed stakeholders. A 10-year project timeline has been constructed for implementation of the Plum Creek Watershed Protection Plan. Increments of years 1-3, 4-6, and 7-10 post-approval and implementation of the plan have been defined. In addition, for most management measures, estimated quantitative targets have been established. This allows key milestones to be tracked over time so that stakeholders can more effectively gauge implementation progress and success. In the event that insufficient progress is being made toward achievement of a particular milestone, efforts will be intensified or adjusted as necessary. Multi-year increments also take into account the fact that many management practices will require the acquisition of funding, hiring of staff, and the implementation of new programs, all of which will have initial time demands. In addition, changes in water quality often are delayed following initial implementation of management measures, and substantive changes generally require several years to be discernable. Thus, while annual assessments of implementation progress will be made, broader evaluations will be used to direct overall program management.

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Table 10.1. Responsible party, implementation milestones, and estimated financial cost for management measures.

Management Measure	Responsible Party	Unit Cost	Number Implemented			Total Cost
			Year			
			1-3	4-6	7-10	
Urban Stormwater Management Measures						
Pet Waste Collection Stations	City of Kyle	\$620/station installation \$85 annual/station	10	4	4	\$22,040 ¹
Pet Waste Collection Stations	City of Lockhart	\$620/station installation \$85 annual/station	10	4	4	\$22,040
Pet Waste Collection Stations	City of Luling	\$620/station installation \$85 annual/station	6	2	2	\$12,475
Pet Waste Collection Stations	City of Buda	\$620/station installation \$85 annual/station	10	4	4	\$22,040
Comprehensive Urban Stormwater Assessment	City of Kyle	\$30,000/survey	1	---	---	\$30,000 ¹
Retrofit Stormwater Detention Basins	City of Kyle	\$35,000 engineering \$50,000/basin	2	---	---	\$135,000 ¹
Initiate Street Sweeping Program	City of Kyle	\$110,000/sweeper	---	---	---	\$110,000 ²
Comprehensive Urban Stormwater Assessment	City of Lockhart	\$25,000/survey	1	---	---	\$25,000
Manage Urban Waterfowl Populations	City of Lockhart	---	---	---	---	N/A
Comprehensive Urban Stormwater Assessment	City of Luling	\$20,000/survey	1	---	---	\$20,000
Rehabilitate Stormwater Retention Pond	City of Luling	\$500,000/pond	1		---	\$500,000
Initiate Street Sweeping Program	City of Buda	\$150,000/sweeper	1	---	---	\$150,000 ²
Wastewater Management Measures						
Wastewater Upgrade (TSS Reduction)	WWTF Operators	\$500,000/ 1 MGD facility		3	7	\$6,000,000
Wastewater Upgrade (Phosphorus Removal)	WWTF Operators	\$60,000/facility (includes material costs)		3	7	\$600,000
Voluntary Monthly <i>E. coli</i> Monitoring	WWTF Operators	\$22/month/facility	---	---	---	\$31,000
Voluntary Monthly Phosphorus Monitoring	WWTF Operators	\$25/month/facility	---	---	---	\$35,000
Sanitary Sewer Pipe Replacement	City of Kyle	\$1,000,000/year	2,400 ft	2,400 ft	3,200 ft	\$10,000,000 ³
Lift Station SCADA Installation	City of Kyle	\$12,000/station	3	4	---	\$84,000
Sanitary Sewer Pipe Replacement	City of Lockhart	\$320,000/year	1,800 ft	1,800 ft	2,400 ft	\$3,200,000 ³
Initiate Sanitary Sewer Inspection Program	City of Luling	\$17,000/camera	1	---	---	\$17,000 ²

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Management Measure	Responsible Party	Unit Cost	Number Implemented			Total Cost
			Year			
			1-3	4-6	7-10	
<i>Wastewater Management Measures (continued)</i>						
Sanitary Sewer Pipe Replacement	City of Luling	\$1,000,000/year	2,400 ft	2,400 ft	3,200 ft	\$10,000,000 ³
Lift Station SCADA Installation	City of Luling	\$12,000/station	4	1		\$60,000
Septic System Inspection/Enforcement (New Position)	Caldwell County	\$50,000/year	2			\$1,000,000
Septic System Repair	Caldwell/Hays Cos.	\$5,000/system	300	300	400	\$5,000,000
Septic System Replacement	Caldwell/Hays Cos.	\$10,000/system	150	150	200	\$5,000,000
Septic System Connection to Sewer	City of Umland	\$2,000/system	100	100	150	\$700,000
<i>Agricultural Management Measures</i>						
WQMP Technician (New Position)	SWCD	\$75,000/year	1			\$750,000
Livestock Water Quality Management Plans	SWCD	\$10,000/plan	65	70	100	\$2,350,000
Cropland Water Quality Management Plans	SWCD	\$10,000/plan	6	9	9	\$240,000
<i>Non-Domestic Animal and Wildlife Management Measures</i>						
Feral Hog Control (New Position)	TWDMS	\$90,000/year	1			\$900,000
Feral Hog Control (Equipment)	TWDMS	---	---	---	---	\$5,000
<i>Monitoring Component</i>						
Targeted Water Quality Monitoring	GBRA	---	1	---	---	\$142,000 ⁴
Comprehensive Stream Assessment	GBRA	\$1,500/assessment	12	12	16	\$60,000
Bacterial Source Tracking	TAMU	---	1	---	---	\$200,000

¹ Activities already funded by the TCEQ 319(h).

² Already purchased with city funds.

³ Estimated necessary total. Partial funds already secured.

⁴ Already funded by the TSSWCB 319(h).

OUTREACH AND EDUCATION

In addition to the implementation of management measures, some financial and technical assistance will be required to conduct the outreach and education measures designed to improve public awareness and participation throughout the process. As outlined in Table 10.2, cooperation among personnel from Extension, TSSWCB, TCEQ, and GBRA will be vital to successful engagement of watershed stakeholders. In addition, city and county staff will play an important role in the dissemination of important information released through the Plum Creek Watershed Partnership. Development of educational materials will be done by these organizations and others, though some assistance will likely be required in the design and construction of larger visuals, such as billboards or watershed signs. Funding for some of these activities will be supported through routine outreach efforts by these groups. However, additional funding will be required to enhance and sustain these efforts and will be sought from outside sources. Clean Water Act (CWA) Section 106 funds will support a number of these strategies and represent an important step in informing the public about Partnership efforts.

Table 10.2. Responsible party, implementation milestones, and estimated financial costs for outreach and education efforts.

Outreach Activity	Responsible Party	Year			Total Cost
		1-3	4-6	7-10	
Broad-Based Programs					
Texas Watershed Steward Training Sessions	Extension	3	2	1	N/A
Elementary School Water Quality Project	GBRA	---	---	---	\$25,000
Plum Creek Watershed Protection Brochure	GBRA	---	---	---	\$15,000 ¹
Tributary and Watershed Roadway Signage	PCW Partnership	60	---	---	\$6,000
Displays at Local Events	Extension/TSSWCB	9	9	9	\$5,400
Watershed Billboards	PCW Partnership	1 sign biennially			\$30,000
Urban Programs					
Pet Waste Programs	Cities/TCEQ/Extension	---	---	---	\$35,000
NEMO Workshops	GBRA/TCEQ/Extension	2	---	---	\$20,000 ¹
Fats, Oils, and Grease Workshop		2	---	---	
Municipal Site Assessment Visits		4	---	---	
Urban Sector Nutrient Education	Extension	3	3	3	N/A
Sports and Athletic Field Education (SAFE)	Extension	3	3	3	N/A

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Outreach Activity	Responsible Party	Year			Total Cost
		1-3	4-6	7-10	
Wastewater Programs					
Develop Septic System Online Training Modules	GBRA	4	---	---	\$30,000 ¹
Septic System Workshops and Assistance	Extension /GBRA	4	3	3	\$25,000 ¹
Agricultural Programs					
Soil and Water Testing Campaigns	Extension	3	3	3	N/A
Agriculture Nutrient Management Education	Extension	3	3	3	N/A
Crop Management Seminars	Extension	3	3	3	N/A
Agricultural Waste Pesticide Collection Days	TCEQ	1	1	1	\$75,000
Livestock Grazing Management Education	Extension	3	3	3	N/A
Non-Domestic Animal and Wildlife Programs					
Feral Hog Management Workshop	Extension	2	1	2	N/A
Stream and Riparian Workshops	Extension	2	1	2	N/A
Additional Programs					
Illegal Dumping Site Targeted Cleanup	GBRA	3	3	3	\$40,000 ¹
Community Stream Cleanup Events		2	3	3	
Rainwater Harvesting Education/ Demonstration	Extension	2	1	2	\$25,000

¹ Estimated necessary total. Funding in years 1-3 is already supported by TCEQ CWA 106; additional funding necessary for subsequent years.

PROGRAM COORDINATION

In addition to technical and financial assistance required for implementation of management measures and outreach programs, it is recommended that a full-time Program Coordinator be employed to facilitate continued progress. This position will oversee project activities, seek additional funding, organize and coordinate regular updates for the Plum Creek Watershed Partnership, maintain the website, and coordinate outreach and education efforts in the watershed. An estimated \$85,000 per year including travel expenses will be necessary for this position.

SOURCES OF FUNDING

Successful acquisition of funding to support implementation of management measures will be critical for the success of the Plum Creek Watershed Protection Plan. While some management measures require only minor adjustments to current activities, some of the most important measures require significant funding for both initial and sustained implementation. Discussions with the steering committee and work groups, city officials, agency representatives, and other professionals were used to estimate financial needs. In some cases, funding for key activities already has been secured, either in part or full. Other activities will require funding to conduct preliminary assessments to guide implementation, such as in the case of urban stormwater control. Traditional funding sources will be utilized where available, and creative new approaches to funding will be sought. Some of the key potential funding sources that will be explored include:

Clean Water Act State Revolving Fund

The State Revolving Fund (SRF) administered by the TWDB provides loans at interest rates below the market to entities with the authority to own and operate wastewater treatment facilities. Funds are used in the planning, design, and construction of facilities, collection systems, stormwater pollution control projects, and nonpoint source pollution control projects. Wastewater operators and permittees in the Plum Creek Watershed will pursue these funds to assist in treatment upgrades and to improve treatment efficiency in rural portions of the watershed.

Economically Distressed Area Program (EDAP)

The Economically Distressed Area Program is administered by the TWDB and provides grants, loans, or a combination of financial assistance for wastewater projects in economically distressed areas where present facilities are inadequate to meet residents' minimal needs. While the majority of the watershed does not meet these requirements, small pockets within the area may qualify based on economic requirements of the program. Groups representing these areas may pursue funds to improve wastewater infrastructure.

Environmental Quality Incentives Program (EQIP)

The Environmental Quality Incentives Program is administered by the NRCS. This voluntary conservation program promotes agricultural production and environmental quality as compatible national goals. Through cost-sharing, EQIP offers financial and technical assistance to eligible participants for the installation or implementation of structural controls and management practices on eligible agricultural land. This program will be engaged to assist in the implementation of agricultural management measures in the watershed.

Regional Water Supply and Wastewater Facility Planning Program

The TWDB offers grants for assessments to determine the most feasible alternatives to meet regional water supply and wastewater facility needs, estimate costs associated with implementing feasible wastewater facility alternatives, and identify institutional arrangements to provide wastewater services for areas across the state. This source will be pursued to support wastewater elements of the Plum Creek plan, particularly those pertaining to the implementation of the East Hays County Wastewater Compact.

Section 106 State Water Pollution Control Grants

Through the Clean Water Act, federal funds are allocated along with matching state funds to support state water quality programs, including water quality assessment and monitoring, water quality planning and standard setting, TMDL development, point source permitting, training, and public information. The goal of these programs is the prevention, reduction, and elimination of water pollution. Through a special project from the TCEQ, Section 106 funds have already been allocated to assist in a number of activities, particularly outreach and public education components, in the Plum Creek Watershed.

Section 319(h) Federal Clean Water Act

The USEPA provides funding to states to support projects and activities that meet federal requirements of reducing and eliminating nonpoint source pollution. In Texas, both the TSSWCB and the TCEQ receive 319(h) funds to support nonpoint source projects, with TSSWCB funds going to agricultural and silvicultural issues and TCEQ funds going to urban and other non-agricultural issues. 319(h) funds from the TSSWCB supported the development of the Plum Creek Watershed Protection Plan, and TCEQ funds have already been appropriated to implement some of the management measures recommended in the plan. For instance, a pilot project in the City of Kyle will achieve many of the urban goals for that part of the watershed (Table 10.1). Additional support will be sought from these sources, as appropriate.

Supplemental Environmental Project Program (SEP)

The Supplemental Environmental Projects program administered by the TCEQ aims to direct fines, fees, and penalties for environmental violations toward environmentally beneficial uses. Through this program, a respondent in an enforcement matter can choose to invest penalty dollars in improving the environment, rather than paying into the Texas General Revenue Fund. In addition to other projects, funds may be directed to septic system repair and wildlife habitat improvement opportunities.

Targeted Watersheds Grants Program

The Targeted Watersheds Grants Program is administered by the EPA as a competitive grant program designed to promote community-driven watershed projects. Federal, state, and local programs are brought together to assist in the restoration and preservation of water resources through strategic planning and coordinated project management by drawing in both public and private interests.

Texas Clean Rivers Program (CRP)

The CRP is a statewide water quality monitoring, assessment, and public outreach program funded by state fees. The TCEQ partners with 15 regional river authorities to work toward achieving the goal of improving water quality in river basins across the state. CRP funds are used to promote watershed planning and provide quality-assured water quality data. The Partnership will continue to engage this source to support and enhance surface water quality monitoring in the watershed.

Water Quality Management Plan Program

The WQMP program is administered by the TSSWCB. Also known as the 503 program, the WQMP program is a voluntary mechanism by which site-specific plans are developed and implemented on agricultural and silvicultural lands to prevent or reduce nonpoint source pollution from these operations. Plans include appropriate treatment practices, production practices, management measures, technologies, or combinations thereof. Plans are developed in cooperation with local SWCDs, cover an entire operating unit, and allow financial incentives to augment participation. Funding from the 503 program will be sought to support implementation of agricultural management measures in the watershed.

EXPECTED REDUCTIONS

Expected load reductions of *E. coli* bacteria, nitrate, and total phosphorus at each monitoring station as a result of full implementation of the Plum Creek Watershed Protection Plan are presented in Table 10.3. Certainly, precise estimates of attainable load reductions are difficult to determine, and may change over time due to significant changes in land use and pollutant sources. However, these estimates will be used to demonstrate expected improvement toward target water quality goals for the watershed. With active local stakeholder engagement and participation in plan implementation and continued support from cooperating groups and agencies, the activities outlined here will make significant progress toward improving and protecting water quality in the Plum Creek Watershed.

Table 10.3. Estimated regional pollutant load reductions expected upon full implementation of the Plum Creek Watershed Protection Plan.

Management Measure	Expected Load Reduction								
	Uhland			Lockhart			Luling		
	Ec ¹	N ²	P ³	Ec	N	P	Ec	N	P
Urban Stormwater Management Measures									
Pet Waste Collection Stations	7.2E+12	70.6	8.2	7.3E+12	158.5	17.9	3.1E+14	1.4	N/A
Comprehensive Urban Stormwater Assessment	4.3E+13	531.7	19.1	1.9E+13	929.6	32.5	9.1E+14	7.8	N/A
Retrofit Stormwater Detention Basins									
Initiate Street Sweeping Program									
Manage Urban Waterfowl Populations									
Rehabilitate Stormwater Retention Pond									
Wastewater Management Measures									
Wastewater Upgrade (TSS Reduction)	3.5E+10	N/A	N/A	2.1E+10	N/A	N/A	1.6E+12	N/A	N/A
Wastewater Upgrade (Phosphorus Removal)									
Voluntary Monthly <i>E. coli</i> Monitoring									
Voluntary Monthly Phosphorus Monitoring									
Sanitary Sewer Pipe Replacement									
Lift Station SCADA Installation									
Initiate Sanitary Sewer Inspection Program									
Septic System Inspection/Enforcement (New Position)	6.1E+12	22.7	13.3	5.0E+12	42.2	24.2	2.0E+14	0.4	N/A
Septic System Repair									
Septic System Replacement									
Septic System Connection to Sewer									

Management Measure	Expected Load Reduction								
	Uhland			Lockhart			Luling		
	Ec ¹	N ²	P ³	Ec	N	P	Ec	N	P
<i>Agricultural Management Measures</i>									
WQMP Technician (New Position)	9.6E+12	5,472	827	2.1E+13	30,427	4,772	2.9E+15	542	N/A
Livestock Water Quality Management Plans									
Cropland Water Quality Management Plans									
<i>Non-Domestic Animal and Wildlife Management Measures</i>									
Feral Hog Control (New Position)	7.3E+12	1,615	327	1.2E+13	5,902	1,163	2.1E+15	105	N/A
Feral Hog Control (Equipment)									

¹ Ec: *E. coli* reduction indicated in cfu/year

² N: Nitrogen reduction in kg/year

³ P: Phosphorus reduction in kg/year

