

**Texas State Soil and Water Conservation Board Clean
 Water Act §319(h) Nonpoint Source Grant Program
 FY 2019 Project 19-04**

SUMMARY PAGE	
Title of Project	Statewide Delivery of Lone Star Healthy Streams Feral Hog Component and Providing Technical Assistance on Feral Hog Management in Priority Watersheds
Project Goals	<ul style="list-style-type: none"> • Facilitate statewide implementation of feral hog damage management education through watershed-based group trainings. • Promote healthy watersheds by increasing citizen awareness, understanding, and knowledge about the biology, impacts and economics, methods of removal, and laws and regulations concerning the management of feral hogs. • Enhance watershed education across the state as it relates to the reduction of feral hog damage in Texas. • Empower individuals and communities to find creative solutions to improve watershed health by reducing populations of the non-native invasive feral hog.
Project Tasks	(1) Project Administration; (2) Coordinate and deliver watershed-based feral hog education trainings in selected watersheds throughout Texas; (3) Evaluate the effectiveness of the feral hog education trainings; (4) Distribute and manage computer-based training
Measures of Success	<ul style="list-style-type: none"> • Deliver a minimum of 36 watershed-based feral hog trainings in selected watersheds • Numbers of citizens participating in watershed-based feral hog trainings • Increased knowledge and plans for practice adoption of feral hog population reduction techniques, as measured by retrospective post-tests.
Project Type	Implementation (); Education (X); Planning (); Assessment (); Groundwater ()

Status of Waterbody on 2014 Texas Integrated Report	Segment ID	Parameter of Impairment or Concern	Category
	0821C – Wilson Creek	Bacteria	5c
	0821D – East Fork Trinity River above Lake Lavon	Bacteria	5c
	1217D – North Rocky Creek	Depressed DO	5c
	1810 – Plum Creek	Depressed DO, Nitrate, Orthophosphorus	5b,5b 5c
	2201B – Unnamed Drainage Ditch Tributary (B)	Bacteria	5c
	2202 – Arroyo Colorado Above Tidal	Bacteria, Mercury in ET, PCBs in ET	5b,5c, 5a
	2201- Arroyo Colorado Tidal	Bacteria, DDE in ET Depressed DO, Mercury in ET, PCBs in ET	5c,5c 5a, 5c 5a
	1804A-Geronimo Creek	Bacteria	5c
	0612-Attoyac Bayou	Bacteria	5b
	1221-Leon River Below Proctor Lake	Bacteria	5c
	1221A-Resley Creek	Bacteria, Depressed DO	5b,5b
	1221D-Indian Creek	Bacteria	5b
	1221F-Walnut Creek	Bacteria	5c
	2422B-Double Bayou West Fork	Bacteria, Depressed DO, Dioxin in ET, PCBs in ET	5c,5b,5a 5a
	2422D-Double Bayou East Fork	Bacteria, Dioxin in ET, PCBs in ET	5c,5a,5a
	1209E-Wickson Creek	Bacteria	5b
	1209-Navasota River Below Lake Limestone	Bacteria	5c
	1209H-Duck Creek	Bacteria, Depressed DO	5b,5c
	1209I-Gibbons Creek	Bacteria	5b
	1209J-Sheperd Creek	Bacteria	5b
	1209K-Steele Creek	Bacteria	5b
	1210A-Navasota River above Lake Mexia	Bacteria	5c
	1202K-Mill Creek	Bacteria	5c
	2001- Mission River Tidal	Bacteria	5a
	2004-Aransas River Above Tidal	Bacteria	5c

	2003-Aransas River Tidal	Bacteria	5a
	2004A-Aransas Creek	Bacteria	5b
	2004B-Poesta Creek	Bacteria	5c
	1105-Bastrop Bayou Tidal	Bacteria	5c
	1105A-Flores Bayou	Bacteria	5c
	1105B-Austin Bayou Tidal	Bacteria	5c
	1105C-Austin Bayou Above Tidal	Bacteria	5c
	1105E-Brushy Bayou	Bacteria, Depressed DO	5c,5c
	1103C-Geisler Bayou	Depressed DO	5c
	1103D-Gum Bayou	Bacteria	5a
	1103E-Cedar Creek	Bacteria	5a
	1103-Dickinson Bayou Tidal	Bacteria, Depressed DO, Dioxin in ET PCBs in ET	5a,5b,5a 5a
	1428C-Gilleland Creek	Bacteria	CN
	1003-East Fork of San Jacinto River	Bacteria	5a
	1004-West Fork of San Jacinto River	Bacteria	5a
	1010C-Spring Branch	Depressed DO	5c
	1008-Spring Creek	Depressed DO	5c
	1301-San Bernard River Tidal	Bacteria	5c
	1302-San Bernard River Above Tidal	Bacteria	5b
	1302A-Gum Tree Branch	Bacteria	5b
	1302B-West Bernard Creek	Bacteria, Depressed DO	5b,5c
	1110-Oyster Creek Above Tidal	Bacteria, Depressed DO	5c,5b
	1245F-Alcorn Bayou	Bacteria	5b
	1245C-Bullhead Bayou	Bacteria	5c
	1245D-Unnamed Tributary of Bullhead Bayou	Bacteria	5c
	1245I-Steep Bank Creek	Bacteria	5b

<p>Project Location (Statewide or Watershed and County)</p>	<p>Lake Lavon Watershed in Collin, Fannin, Grayson and Hunt Counties; Lampasas River Watershed in Bell, Burnet, Coryell, Hamilton, Lampasas, Mills and Williamson Counties; Plum Creek Watershed in Caldwell, Hays, and Travis Counties; Arroyo Colorado Watershed in Hidalgo, Willacy and Cameron Counties; Geronimo Creek Watershed in Guadalupe and Comal Counties; Attoyac Bayou in Rusk, Nacogdoches, San Augustine, and Shelby Counties; Leon River Watershed below Proctor Lake and above Belton Lake in Comanche, Hamilton, Erath, Coryell, Mills and Bell Counties; Double Bayou Watershed in Liberty and Chambers Counties; Navasota River (below Lake Limestone) Watershed in Limestone, Robertson, Madison and Grimes Counties; Mill Creek Watershed in Austin and Washington Counties; Copano Bay, Mission and Aransas River Watershed in Nueces, San Patricio, Jim Wells and Live Oak Counties; Bastrop Bayou Watershed in Brazoria County; Dickinson Bayou in Brazoria and Galveston Counties; Gilleland Creek in Travis County; Lake Granbury Watershed in Hood, Parker, Palo Pinto, Ranger, Erath, and Jack Counties; Lake Houston Area Watersheds in Grimes, Harris, Liberty, Montgomery, San Jacinto, Walker, and Waller Counties; Lower San Antonio River Watershed in DeWitt, Goliad, Guadalupe, Karnes, Refugio, Victoria, and Wilson Counties; San Bernard River Watershed in Austin, Colorado, Wharton, Fort Bend, and Brazoria Counties; Upper Oyster Creek in Fort Bend County</p>					
<p>Key Project Activities</p>	<p>Hire Staff (X); Surface Water Quality Monitoring (); Technical Assistance (X); Education (X); Implementation (); BMP Effectiveness Monitoring (); Demonstration (X); Planning (); Modeling (); Bacterial Source Tracking (); Other ()</p>					
<p><i>2017 Texas NPS Management Program Reference</i></p>	<ul style="list-style-type: none"> • Component One – LTGs 1, 2, 3, 4 • Component One – STGs 3A, 3B, 3F • Component Two & Three 					
<p>Project Costs</p>	<p>Federal</p>	<p>\$432,978</p>	<p>Non-Federal</p>	<p>\$287,666</p>	<p>Total</p>	<p>\$720,644</p>
<p>Project Management</p>	<ul style="list-style-type: none"> • Texas A&M Natural Resources Institute 					
<p>Project Period</p>	<p>September 1, 2019 – September 30, 2023</p>					

Part I – Applicant Information

Applicant							
Project Lead		James C. Cathey					
Title		Associate Director					
Organization		Texas A&M Natural Resources Institute					
E-mail Address		James.cathey@ag.tamu.edu					
Street Address		1001 Holleman Drive East					
City	College Station	County	Brazos	State	TX	Zip Code	77840-0662
Telephone Number			979-458-2565		Fax Number		979-845-0662

Project Partners	
Names	Roles & Responsibilities
Texas State Soil and Water Conservation Board (TSSWCB)	Provide state oversight and management of all project activities and ensure coordination of activities with related projects and TCEQ.
Texas A&M AgriLife Extension Service – Texas A&M Natural Resources Institute	Provide overall project management including project coordination, submission of quarterly and final reports, delivery of feral hog management education workshops, distribution and support of computer-based training, and evaluation of program effectiveness.

Part II – Project Information

Project Type

Surface Water	X	Groundwater	
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Does the project implement recommendations made in (a) a completed WPP, (b) an adopted TMDL, (c) an approved I-Plan, (d) a Comprehensive Conservation and Management Plan developed under CWA §320, (e) the <i>Texas Coastal NPS Pollution Control Program</i> , or (f) the <i>Texas Groundwater Protection Strategy</i> ?	Yes	X	No
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If yes, identify the document.	<p>Bastrop Bayou Watershed Protection Plan; Eight Total Maximum Daily Loads for Indicator Bacteria in Dickinson (Draft) Bayou and Three Tidal Tributaries; Geronimo and Alligator Creeks Watershed Protection Plan; Implementation Plan for One Total Maximum Daily Load for Bacteria in Gilleland Creek; Lake Granbury Watershed Protection Plan; Fifteen TMDLs for Indicator Bacteria in Watersheds of the Lake Houston Area; Watershed Protection Plan for the Leon River Below Proctor Lake and Above Belton Lake; One Total Maximum Daily Load for Bacteria in the Lower San Antonio River; Plum Creek Watershed Protection Plan; San Bernard River Watershed Protection Plan; One TMDL for Bacteria in Upper Oyster Creek; Draft Lavon Lake Watershed Protection Plan; Lampasas River Watershed Protection Plan; 2014 Update to the Plum Creek Watershed Protection Plan; Draft Update to the Arroyo Colorado Watershed Protection Plan; Attoyac Bayou Watershed Protection Plan; The Double Bayou Watershed Protection Plan; Draft Navasota River Below Lake Limestone Watershed Protection Plan; Navasota River Watershed Partnership and TWRI; Mill Creek Watershed Protection Plan; Draft Lower Nueces River Watershed Protection Plan</p>
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<p>If yes, identify the agency/group that developed and/or approved the document.</p>	<p>Bastrop Bayou Stakeholder Group facilitated by Houston-Galveston Area Council, Galveston Bay Estuary Program and TCEQ; TCEQ, University of Houston, and CDM; The Geronimo and Alligator Creeks Watershed Partnership facilitated by GBRA, Texas AgriLife Extension Service and TSSWCB; TCEQ and the Lower Colorado River Authority; The Lake Granbury Watershed Protection Plan Stakeholders Committee facilitated by the Brazos River Authority and TCEQ; TCEQ and James Miertschin & Associates, Inc.; Parsons Water & Infrastructure Inc. and the Brazos River Authority; TCEQ and James Miertschin & Associates, Inc.; Plum Creek Watershed Partnership facilitated by Texas AgriLife Extension Service and TSSWCB; Houston-Galveston Area Council and TCEQ; TCEQ and Texas Institute of Applied Environmental Research; The Lavon Lake Watershed Partnership; The Lampasas River Watershed Partnership; The Plum Creek Watershed Partnership; The Arroyo Colorado Watershed Partnership; The Attoyac Bayou Watershed Partnership; Double Bayou Watershed Partnership; Mill Creek Watershed Partnership; Nueces River Watershed Partnership</p>	<p>Year Developed</p>	<p>2011; 2012, 2012, 2007, 2011, 2011; 2015; 2008; 2008; 2011; 2007; 2017; 2013; 2014; 2017; 2014; 2016; 2016; 2015; 2016</p>
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Watershed Information				
Watershed or Aquifer Name(s)	Hydrologic Unit Code (12 Digit)	Segment ID	Category on 2014 IR	Size (Acres)
Lake Lavon Watershed	120301060207 120301060205 120301060206 120301060203 120301060202 120301060201	0821C 0821D	5c 5c	492,094
Lampasas River Watershed	120702030503 120702030501	1217D	5c	839,799

Plum Creek Watershed	121002030406 121002030410 121002030408 121002030409 121002030407 121002030404 121002030403 121002030405 121002030402 121002030401	1810	5b 5b 5c	248,877
Arroyo Colorado Watershed	121102080800 121102080700 121102080300 121102080100 121102080600	2201B 2202 2201	5b 5b 5c	449,605
Geronimo Creek Watershed	121002020111 121002020110	1804A	5c	44,089
Attoyac Bayou	120200050301 120200050501 120200050406 120200050402 120200050403 120200050307 120200050401 120200050303	0612	5b	365,899
Leon River Watershed	120702010907 120702011002 120702010905 120702010908 120702010902 120702010806 120702010802 120702010801 120702010705 120702010704 120702010702 120702010701 120702010603 120702010605 120702010509 120702010503 120702010602 120702010601 120702010502 120702010509 120702010501	1221 1221A 1221D 1221F	5c 5b,5b 5b 5c	891,759
Double Bayou Watershed	120402020100	2422B 2422D	5c, 5a, 5a 5b 5c, 5a	89,380

Navasota River Watershed	120701030702 120701030603 120701030602 120701030604 120701030407 120701030804 120701030803 120701030707 120701030704 120701030601 120701030508 120701030510 120701030505 120701030503 120701030309 120701030308 120701030405 120701030404 120701030406 120701030403 120701030706 120701030705 120701030701 120701030509 120701030204 120701030203 120701030202 120701030201 120701030702 120701030102 120701030104 120701030103 120701030101	1209E 1209 1209H 1209I 1209J 1209K 1210A	5b 5c 5b 5b 5b 5b 5c	1,438,717
Mill Creek Watershed	120701040210 120701040208 120701040209	1202K	5c	271,408
Copano Bay, Mission and Aransas Watershed	121004060307 121004060303 121004060301 121004070206 121004070205 121004070106 121004070404 121004070402 121004070401 121004070104 121004070106 121004070102 121004070103 121004070101	2001 2004 2003 2004A 2004B	5a 5c 5a 5b 5c	1,208,304

Bastrop Bayou	120402050400 120402050300 120402050400	1105 1105A 1105B 1105C 1105E	5c 5c 5c 5c 5c, 5c	148,648
Dickinson Bayou	120402040200	1103C 1103D 1103E 1103	5c 5a 5a 5a,5b,5a,5a	63,751
Gilleland Creek	120903010106	1428C	CN	31,361
Lake Granbury Watershed	N/A	N/A	N/A	1,335,143
Lake Houston Area Watersheds	120401030402 120401020212 120401010401 120401020106 120401020105 120401020210 120401020213 120401030110 120401030105 120401030109 120401030104 120401030103 120401030102 120401030101 120401030108 120401030107 120401030106 120401020102 120401020104 120401020103 120401020106 120401020107 120401020101 120401020213 120401020205 120401020212 120401020202 120401030105	1003 1004 1010C 1008	5a 5a 5c 5c	638,023

Lower San Antonio River Watershed	121003030206 121003040405 121003030501 121003030606 121003030607 121003030505 121003030605 121003030403 121003030503 121003030404 121003030205 121003030206 121003040405 121003030202 121003030604 121003030608 121003030403	1902 1901 1901A 1901B 1911	5b 5c 5c 5c 5c	357,392
San Bernard River Watershed	120904010308 120904010307 120904010306 120904010305 120904010304 120904010302 120904010205 120904010203 120904010109 120904010106 120904010104 120904010206 120904010207 120904010102 120904010202 120904010201 120904010204	1301 1302 1302A 1302B	5c 5b 5b 5b, 5c	680,111
Upper Oyster Creek	120701040403 120402050200 120402050100	1110 1245F 1245C 1245D 1245I	5c, 5b 5b 5c 5c 5b	151,967

Water Quality Impairment

Describe all known causes (i.e., pollutants of concern) and sources (e.g., agricultural, silvicultural) of water quality impairments or concerns from any of the following sources: *2014 Texas Integrated Report*, Clean Rivers Program Basin Summary/Highlights Reports, or other documented sources.

Segment ID	Body Name	Impairment	Code
0821C	Wilson Creek	Bacteria	5c
0821D	East Fork Trinity River above Lake Lavon	Bacteria	5c
1217D	North Rocky Creek	Depressed dissolved oxygen	5c
2201B	Unnamed Drainage Ditch Tributary (B) in Cameron County Drainage District #3	Bacteria	5b
2202	Arroyo Colorado Above Tidal	Bacteria	5b
2201	Arroyo Colorado Tidal	Bacteria	5c
1804A	Geronimo Creek	Bacteria	5c
0612	Attoyac Bayou	Bacteria	5b
1221	Leon River Below Proctor Lake	Bacteria	5c
1221A	Resley Creek	Bacteria	5b
		Depressed dissolved oxygen	5b
1221D	Indian Creek	Bacteria	5b
1221F	Walnut Creek	Bacteria	5c
2422B	Double Bayou West Fork	Bacteria	5c
		Depressed dissolved oxygen	5b
		Dioxin in edible tissue	5a
		PCBs in edible tissue	5a
2422D	Double Bayou East Fork	Bacteria	5c
		Dioxin in edible tissue	5a
		PCBs in edible tissue	5a
1209	Navasota River Below Lake Limestone	Bacteria	5c
1209E	Wickson Creek	Bacteria	5b
1209H	Duck Creek	Bacteria	5b
		Depressed dissolved oxygen	5c
1209I	Gibbons Creek	Bacteria	5b
1209J	Shepherd Creek	Bacteria	5b
1209K	Steele Creek	Bacteria	5b
1202K	Mill Creek	Bacteria	5c
2001	Mission River Tidal	Bacteria	5a
2003	Aransas River Tidal	Bacteria	5a
2004	Aransas River Above Tidal	Bacteria	5c
2004A	Aransas Creek	Bacteria	5b
2004B	Poesta Creek	Bacteria	5c

1105	Bastrop Bayou Tidal	Bacteria	5c
1105A	Flores Bayou	Bacteria	5c
1105B	Austin Bayou Tidal	Bacteria	5c
1105C	Austin Bayou Above Tidal	Bacteria	5c
1105E	Brushy Bayou	Bacteria	5c
		Depressed dissolved oxygen	5c
1003	East Fork San Jacinto River	Bacteria	5a
1004	West Fork San Jacinto River	Bacteria	5a
1010C	Spring Branch	Depressed dissolved oxygen	5c
1008	Spring Creek	Depressed dissolved oxygen	5c
1902	Lower Cibolo Creek	Bacteria	5b
1901	Lower San Antonio River	Impaired fish community	5c
1901A	Escondido Creek	Bacteria	5c
1901B	Cabeza Creek	Bacteria	5c
1911	Upper San Antonio River	Impaired fish community	5c
1301	San Bernard River Tidal	Bacteria	5c
1302	San Bernard River Above Tidal	Bacteria	5b
1302A	Gum Tree Branch	Bacteria	5b
1302B	West Bernard Creek	Bacteria	5b
		Depressed dissolved oxygen	5c
1110	Oyster Creek Above Tidal	Bacteria	5c
		Depressed dissolved oxygen	5b
1245F	Alcorn Bayou	Bacteria	5b
1245C	Bullhead Bayou	Bacteria	5c
1245D	Unnamed Tributary of Bullhead Bayou	Bacteria	5c
1245I	Steep Bank Creek	Bacteria	5b
1103C	Geisler Bayou	Depressed dissolved oxygen	5c
1103D	Gum Bayou	Bacteria	5a
1103E	Cedar Creek	Bacteria	5a
1103	Dickinson Bayou Tidal	Bacteria	5a
		Depressed dissolved oxygen	5b
		Dioxin in edible tissue	5a
		PCBs in edible tissue	5a

Project Narrative

Problem/Need Statement

All watersheds in Texas are threatened by nonpoint source (NPS) pollution which is detrimental to the valuable water resources of the state. To help combat this threat, federal and state water resource management agencies have adopted the Watershed Approach for managing water quality. One vital component of this approach involves engaging local stakeholders to become actively involved in planning and implementing water resource management and protection programs in their watershed. Many watershed protection plans (WPP) and Total Maximum Daily Loads (TMDLs) being developed now call for the removal of feral hogs to reduce their negative effects on water quality (e.g., Plum Creek, Leon River). Providing education to landowners about effective management strategies is crucial to the success of reducing feral hog populations.

Feral hogs have emerged as one of the greatest damage management challenges in the United States to wildlife, agriculture and stream health. Feral hogs have established themselves across Texas and pose a variety of challenges, including riparian and sedimentation damage, agricultural loss, predation, transmittal of disease and parasites, and environmental damage to both urban and rural environments. Between 1900 and 1990, the national population size and distribution of these animals in the United States had been relatively constant, including between 500,000 to 2 million animals found in 18 to 21 states. Today, the National Feral Swine Mapping System program currently reports 37 states with established populations of wild pigs. Nationwide, populations were estimated at more than 4 million animals with an estimated 2.6 million head in Texas alone, making them one of the most abundant large invasive animal species to be found in the United States at present. Population modeling indicates that as of 2017 there are potentially as many as 3-5 million feral hogs now in Texas alone.

The yearly crop damages and control costs were reported to be >\$1.5 billion across the United States annually (Pimental, 2007), a figure today likely to be significantly higher. Feral hogs have caused a high level of economic, biologic, and natural resource damage as their numbers rapidly expand and their impact is now considered a national threat. This non-native invasive species is a liability to Texas waterways and ecosystems. Effects of their activities impacting water resources include increased sediments loads, algae blooms, oxygen depletion, and bank erosion. In areas where high numbers of hogs are present or where animals spend a significant portion of their time in and near streams, they can be a potentially major contributor of bacteria and nutrients, which can substantially impact water quality. In addition to water quality issue, destruction of habitat for native wildlife and the predation of wildlife is a concern keeping ecosystems intact.

Evidence of feral hog activity and damage is observed frequently in many watersheds. Their local population and range appear to be expanding, and analyses demonstrate these animals are likely a source of NPS pollution to streams. Further, financial losses to the agricultural community in Texas are estimated at \$52 million on an annual basis. Landowners spend an estimated \$7 million annually on their control and/or correction of damage. However, these values are far underestimated, as damage to suburban areas was not included in the assessment. Likewise, monetary effects of problems associated with erosion, nutrient cycling, and water quality are just now being assessed by researchers. Additionally, it is clear that feral hogs have the potential to contribute *E.coli*, some of which could be pathogenic, that further degrade water quality but more importantly contribute to current bacteria impairments in Texas streams. Emerging bacterial source tracking (BST) studies are now providing insight as to the extent of feral hog bacterial contributions within watersheds statewide.

Through TSSWCB project 08-07, *Implementing Agriculture Nonpoint Source Components of the Plum Creek Watershed Protection Plan*, feral hogs gained considerable attention in the planning phase, resulting in an education campaign to describe techniques used by the public for feral hog removal. A full time Extension Assistant was hired to spearhead educational efforts in Travis, Hays, and Caldwell counties. Education outlets took several forms including: 56 one-on-one technical guidance site visits; 25 face-to-face community presentations with 3,301 attendees; development of web-based reporting tools to gather information on number of feral hog sightings, hogs removed, and methods of capture; a project description tri-fold pamphlet; 10 news releases with an audience considered to be several hundred thousand people; 12 hardcopy peer-edited articles, 7 of which were translated to Spanish; over 11,115 combined internet

downloads/reads of 12 peer-edited articles; 13 internet web-videos viewed over 83,000 times; 2 voice-over presentations; 2 radio interviews having a 98 county-area broadcast with the potential to be heard by 6.5 million people.

Through TSSWCB project 12-06, *Statewide Delivery of Lone Star Healthy Streams Feral Hog Component and Providing Technical Assistance on Feral Hog Management in Priority Watersheds*, feral hog outreach efforts addressed the needs of Texas landowners and the public on a large scale. This project resulted in a widespread and modernized educational campaign that incorporated outlets including social media, videos, publications, newsletters, articles, distance-based/online education, media interviews, technical site visits and others in addition to conventional face-to-face programming. One full time Extension Associate and 2 Extension Assistants were employed during the campaign. Resulting efforts included: 41 one-on-one technical guidance site visits; 170 face-to-face presentations (15 four-hour and 155 one-hour) with 10,787 attendees; 97% of surveyed participants reported knowledge gained concerning feral hog biology, legal control options, efficient trap/bait techniques and types/extent of feral hog damage; a statewide online feral hog reporting tool with a total of 2,785 hogs sighted and 1,333 hogs removed based on 861 total reports; 25 web videos viewed 114,603 times; a feral hogs Facebook page with 3,466 “Likes” reaching 7,781 unique users monthly; a feral hogs Twitter page that has 206 followers reaching 1,983 individuals monthly; 37 blog articles with 66,490 views; 94 online articles about project activities composed by outside media; 25 newspaper interviews; 21 AgriLife Communications news releases; 9 magazine articles; 1 television interview and 1 radio interview.

Through TSSWCB project 09-06, *Development of a Synergistic, Comprehensive Statewide Lone Star Healthy Streams Program*, many of the feral hog educational resources developed for the Plum Creek Watershed have been incorporated into the Lone Star Healthy Streams (LSHS) Program. The goal of the LSHS Program is the protection of Texas waterways from bacterial contamination originating from livestock operations and feral hogs. To achieve this goal, LSHS’s objective is the education of Texas farmers, ranchers, and landowners about proper grazing, feral hog management, and riparian area protection to reduce the levels of bacterial contamination in streams, rivers, and other waterbodies. The program’s major goal is the protection of Texas waterways from bacterial contamination originating from beef cattle, dairy cattle, horses, poultry, and feral hogs. The framework for LSHS is five resource manuals that focus on bacterial runoff management for beef cattle, dairy cattle, horses, poultry, and feral hogs.

Through enhanced education regarding riparian protection and vegetation management on grazing lands, LSHS will further protect Texas waterways from sediment, nutrient, and pesticide runoff with the concomitant loss of water and topsoil. LSHS is the state’s primary coordinated and comprehensive educational program to address NPS pollution and water quality impacts from livestock operations and feral hogs. This project will deliver the feral hog component of the LSHS Program in priority watersheds.

In the last grant cycle, the Wildlife and Fisheries Extension Unit’s and now Texas A&M Natural Resources Institute’s outreach and educational efforts relative to feral hog damage abatement were delivered to the public by County Extension Agents at the county, multi-county, regional and state levels with the support of Extension Wildlife Specialists and Associates via direct contact (i.e., phone, e-mail, publications, one-on-one), mass media, group meetings as applied research/result demonstrations. Based on evaluations conducted statewide, program participants reported damage in the following categories: pastures-83%; fences, water troughs or other improvements-48%; owner/employee time-35%; commodity crops-39%; loss of hunting lease value, wildlife food plots/feeders-22%; wetlands-23%; loss of land value-28%; equipment/vehicles-14%; specialty crops-22%; livestock-17%; stored commodities-8%; and personal injuries-2%.

Increases in knowledge among program participants revealed the following on specific subjects (before vs. after a program) included: feral hog biology-88%; legal control options-85%; efficient trap/bait techniques-87%; types/extent of hog damage-57%. Ninety-nine percent of respondents increased their general knowledge of feral hogs and their control.

Program evaluations revealed the following practice adoptions by percentage: use larger traps-64%; pre-bait traps to encourage consistent feral swine visits-36%; scout for feral swine-48%; use baits with scent appeal-15%; market trapped feral swine to offset economic impacts-43%; set traps whenever fresh sign appears-35%; vary/change baits

used in traps at different locations-20%; and use protective eyewear/gloves during field dressing as a disease precaution-12%.

Through TSSWCB project 14-12, *Statewide Delivery of Lone Star Healthy Streams Feral Hog Component and Providing Technical Assistance on Feral Hog Management in Priority Watersheds*, feral hog outreach efforts continued to provide resources and education to Texas landowners and the public. Momentum gained through TSSWCB project 12-06 resulted in an expanded campaign that extended into schools, urban/suburban areas, homeowners associations, various conservation groups, and other entities statewide in addition to conventional programming. Social media, videos, publications, newsletters, articles, distance-based/online education, media interviews, technical site visits and other outlets remained integral supplementation to face-to-face program delivery. Resulting efforts included: 180 face-to-face presentations (159 one-hour and 17 four-hour workshops), 19 technical site visits and 4 educational booths which amassed 12,071 direct contact hours. Post program evaluations showed that 98.7% of surveyed participants reported knowledge gained concerning feral hog biology, legal control options, efficient trap/bait techniques and types/extent of feral hog damage. A 6 video “Wild Pig Management Video Series” was created that has gained 62,979 views and counting. An additional 17 educational feral hog web videos were created which have gained 25,832 views. Other resources include a statewide online feral hog reporting tool with 115 total reports of feral hogs sighted or removed; a feral hogs Facebook page with a reach of 356,600 people; a feral hogs Twitter page that has 680 followers; a “Coping with Feral Hogs” website that received 212,597 page views (192,655 unique page views); 21 blog articles with 48,019 views; 5 editions of the “Wild Pig Newsletter” publications which have 343 subscribers and an online reach of 6,514 readers via Facebook (also distributed by CEA’s statewide); 2 wild pig distance education courses; 2 narrated wild pig education programs; 3 extension publications; 5 newspaper interviews; 19 AgriLife Communications news releases; 2 magazine articles and 4 television interviews. TSSWCB project 14-12 is ongoing, and metrics associated with outreach and educational efforts continue to grow.

Public education and outreach regarding feral hog management measures has been successfully implemented in the Plum Creek WPP and through additional programming of the Texas A&M AgriLife Extension Service. This agency and specifically the Texas A&M Natural Resources Institute provides quality, relevant outreach and continuing education programs and services to the people of Texas and the demand for information related to the management of feral hogs is high among many clientele groups in Texas.

Feral hog abatement remains an important educational process in Texas and our past efforts show a track record of productivity and high return on the dollar invested. This project will continue statewide implementation, in targeted watersheds with bacteria impairments and WPPs/TMDLs, of the feral hog educational program to support and enhance current and future watershed management and protection efforts by watershed partnerships, agencies and natural resource organizations in Texas.

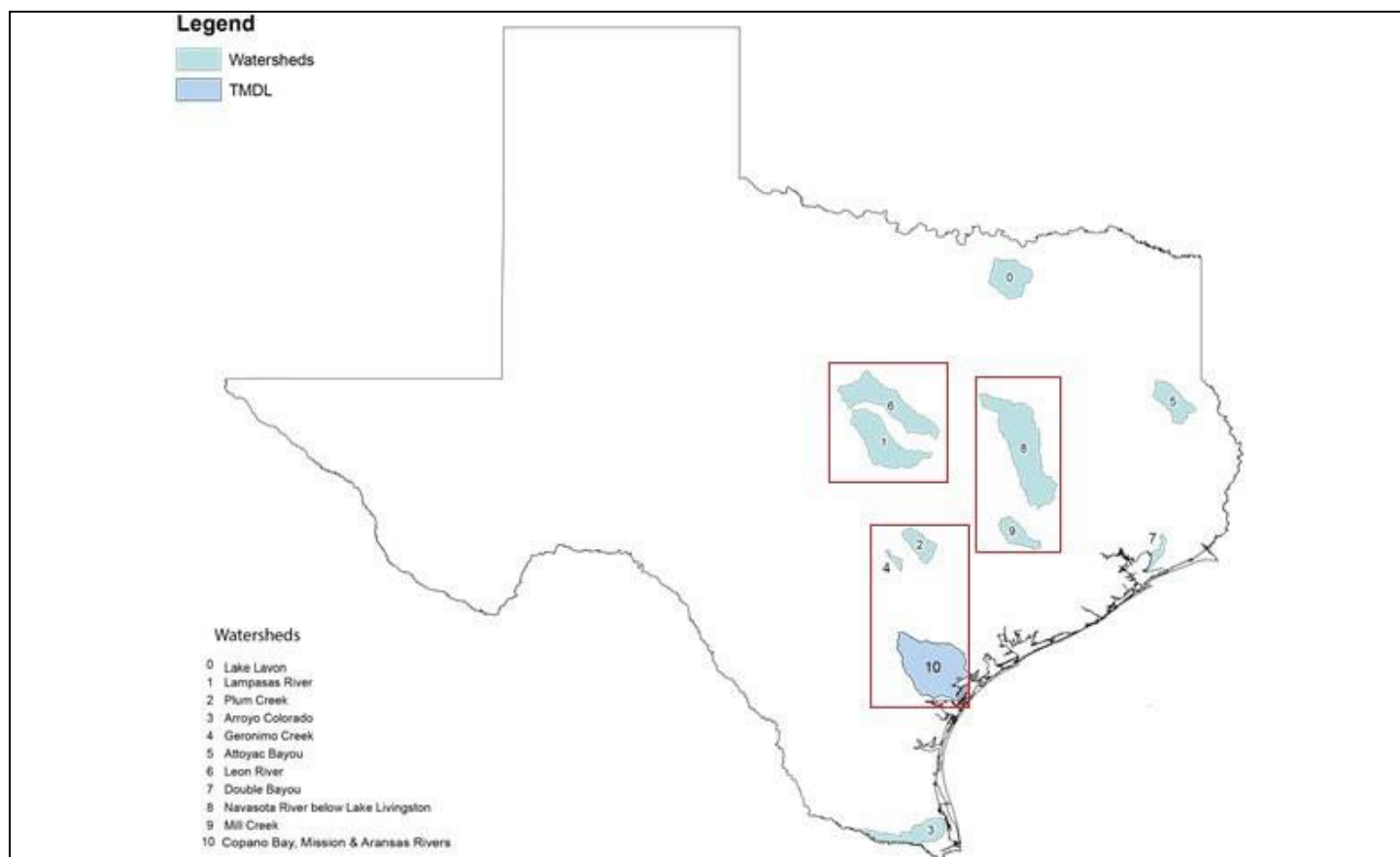
Project Narrative

General Project Description (Include Project Location Map)

This project will continue the statewide implementation of the feral hog management education program by conducting watershed-based trainings in selected watersheds. Priority watersheds will be selected in collaboration with TSSWCB and primarily represent those developing or in implementation phases of WPPs or TMDLs. Other watersheds may be selected based on need and in response to collaborations with other groups and organizations, including river authorities, SWCDs, local citizen groups/watershed associations, etc. Watersheds will be selected consistent with the State's implementation of the *Texas NPS Management Program* and specific CWA §319(h)-funded projects.

Priority watersheds selected for feral hog education trainings will be identified for water quality impairments resulting from high feral hog activity. Watershed-based feral hog education trainings will be tailored as much as possible to the watershed to convey biology, best management practices, removal techniques and laws and regulations associated with managing populations of this invasive species. Priority watersheds will include, but are not limited to, Lake Lavon Watershed in Collin, Fannin, Grayson and Hunt Counties; Lampasas River Watershed in Bell, Burnet, Coryell, Hamilton, Lampasas, Mills and Williamson Counties; Plum Creek Watershed in in Caldwell, Hays, and Travis Counties; Arroyo Colorado Watershed in Hidalgo, Willacy and Cameron Counties; Geronimo Creek Watershed in Guadalupe and Comal Counties; Attoyac Bayou in Rusk, Nacogdoches, San Augustine, and Shelby Counties; Leon River Watershed below Proctor Lake and above Belton Lake in Comanche, Hamilton, Erath, Coryell, Mills and Bell Counties; Double Bayou Watershed in Liberty and Chambers Counties; Navasota River (below Lake Limestone) Watershed in Limestone, Robertson, Madison and Grimes Counties; Mill Creek Watershed in Austin and Washington Counties and Copano Bay, Mission and Aransas River Watershed in Nueces, San Patricio, Jim Wells and Live Oak Counties. Additional watersheds will include, but are not limited to: Bastrop Bayou Watershed in Brazoria County; Dickinson Bayou in Brazoria and Galveston Counties; Gilleland Creek in Travis County; Lake Granbury Watershed in Hood, Parker, Palo Pinto, Ranger, Erath, and Jack Counties; Lake Houston Area Watersheds in Grimes, Harris, Liberty, Montgomery, San Jacinto, Walker, and Waller Counties; Lower San Antonio River Watershed in DeWitt, Goliad, Guadalupe, Karnes, Refugio, Victoria, and Wilson Counties; San Bernard River Watershed in Austin, Colorado, Wharton, Fort Bend, and Brazoria Counties as well as Upper Oyster Creek in Fort Bend County.

Watershed-Based Feral Hog Educational Trainings. The watershed-based trainings will be delivered as 4-hour training events or a 1-hour presentation at county Extension programs, focusing on biology, removal techniques, and laws and regulations associated with feral hog management that will help improve watershed impairments. Extension will work in concert with state organizations and County Extension Agents to select and schedule locations for the watershed-based feral hog education training events. Priority will be given to locations currently involved in WPP or TMDL processes and those planning future watershed efforts. Preliminary focal areas shown generally by the red rectangles below (Figure 1) include: 1) Lampasas River, 2) Plum Creek, 4) Geronimo Creek, 6) Leon River, 8) Navasota River, 9) Mill Creek and 10) Copano, Mission and Aransas Rivers watersheds. A minimum of three, 4-hour workshops and nine, 1-hour county programs will be conducted annually in selected watersheds. Continuing Education Unit credits, as approved by the Texas Department of Agriculture, will be made available to participants who hold Pesticide Applicators Licenses.



Evaluation and Assessment. Both 4-hour and 1-hour educational programs will include an evaluation component to assess program effectiveness by assessing knowledge gained, dollars saved and plans to adopt damage abatement practices. An evaluation instrument has already been developed and is in use by Extension-NRI. This instrument must be used to maintain the integrity of a long-term data set. Descriptive, correlative, and analysis of variance statistical procedures will be utilized in this evaluation. Results will be summarized in a project final report and shared at the local level with the County Extension Agent.

Development of AgriLife Communication News Releases. News releases will be developed with assistance from AgriLife/NRI Communications to announce educational events and schedules, new extension articles and other pertinent information.

Development of Extension Educational Publications. At least 3 new extension articles regarding feral hog management will be produced (1/yr). Production of 25+ feral hog management articles in the Plum Creek Watershed Partnership demonstrates the ability to identify needs of landowners and deliver educational materials to reduce feral hog numbers. Appeal of the articles continues to be demonstrated by the thousands of read/downloads by internet users and popularity of hardcopies at public meetings.

Development of Extension Educational Videos. At least 3 new extension web-videos will be produced and posted on the Wildlife and Fisheries Extension Unit's / Texas A&M Natural Resources Institute's YouTube channel annually. Appeal of this site and videos was demonstrated by feral hog videos created throughout the project have been viewed nearly half a million times. One video in the "Wild Pig Management Video Series" gained over 70,000 views since it was created.

Connection with Extension Social Media. Educational materials will be linked via internet resources taking advantage of outlets such as Facebook, YouTube and others. Connectivity among websites for Extension, TSSWCB, natural resource NGOs and other state agencies is a must to gain greater impact of educational resources. When appropriate, materials developed will be incorporated into a separate, ongoing educational Extension outlet at the national level. The Feral Hog Community of Practice hosted by eXtension.org represents a group of experts from 17 states involved in feral hog research and education outreach. The website was accessed 212,597 times in the previous grant cycle. The site now contains numerous feral hog resources including at least 100 Frequently Asked Questions, 50 Educational Articles, Webinars and set of Ask the Expert questions.

This project will support 3 Program Coordinators who will collaborate with existing Extension-NRI members to educate landowners on strategies to reduce and manage feral hog populations. Program Coordinator's will be under the direction of the PI in Texas A&M Natural Resources Institute. Landowners will be encouraged to remove and report the number of feral hogs in their watershed to abate the potential for environmental damage and degradation of water quality. We will work closely with AgriLife County Extension Agents to foster programing.

In addition to tracking feral hog damage management activities, this team will be a vital contact point with the community by disseminating educational materials, promoting feral hog management strategies, and fostering communication and partnership between landowners and stakeholders in general.

Tasks, Objectives and Schedules						
Task 1	Project Administration					
Costs	Federal	\$30,308	Non-Federal	\$20,137	Total	\$50,445
Objective	To effectively administer, coordinate and monitor all work performed under this project including technical and financial supervision and preparation of status reports.					
Subtask 1.1	Texas A&M Natural Resources Institute will prepare electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 1 st of January, April, July and October. QPRs shall be distributed to all Project Partners.					
	Start Date	Month 1		Completion Date	Month 49	
Subtask 1.2	Texas A&M Natural Resources Institute will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly.					
	Start Date	Month 1		Completion Date	Month 49	
Subtask 1.3	Texas A&M Natural Resources Institute will host coordination meetings or conference calls, at least quarterly, with Project Partners to discuss project activities, project schedule, communication needs, deliverables, and other requirements. Texas A&M Natural Resources Institute will develop lists of action items needed following each project coordination meeting and distribute to project personnel.					
	Start Date	Month 1		Completion Date	Month 49	
Subtask 1.4	Texas A&M Natural Resources Institute will develop a Final Report that summarizes activities completed and conclusions reached during the project and discusses the extent to which project goals and measures of success have been achieved.					
	Start Date	Month 1		Completion Date	Month 49	
Deliverables	<ul style="list-style-type: none"> • QPRs in electronic format • Reimbursement Forms and necessary documentation in hard copy format • Final Report in electronic and hard copy formats 					

Tasks, Objectives and Schedules						
Task 2	Coordinate and deliver watershed-based feral hog educational trainings in selected watersheds throughout Texas					
Costs	Federal	\$216,489	Non-Federal	\$143,833	Total	\$360,322
Objective	Facilitate statewide delivery of feral hog education programs to increase understanding of the adverse impact feral hogs can have on habitats and water resources, and to provide understanding of biology, best management practices, reduction techniques and laws and regulations in abatement processes.					
Subtask 2.1	Extension will employ 2 Program Coordinators to serve as the field contact and be responsible for the general oversight and coordination of project activities, as well as servicing watersheds statewide. An additional 1 Program Coordinator will coordinate the activities of the student intern, work on publications, and assist with assessment of attendee evaluations. A program director will provide programming in the northern Texas. A NRI communication specialist and student intern will assist in developing new materials for social media websites on feral hog management, editing videos on feral hog management for websites, managing data and developing info-graphics for the public and watershed coordinators.					
	Start Date	Month 1		Completion Date	Month 49	
Subtask 2.2	Texas A&M Natural Resources Institute will work in concert with state agencies, local organizations and County Extension Agents to select locations for the watershed-based feral hog education training events. Texas A&M Natural Resources Institute will coordinate efforts with state agencies and organizations already involved in WPP/TMDL processes or who are planning future WPP/TMDL processes in specific watersheds. Programming will focus on, but not be limited to, watershed areas such as the Lampasas River Watershed in Bell, Burnet, Coryell, Hamilton, Lampasas, Mills and Williamson Counties; Plum Creek Watershed in Caldwell, Hays, and Travis Counties; Arroyo Colorado Watershed in Hidalgo, Willacy and Cameron Counties; Geronimo Creek Watershed in Guadalupe and Comal Counties; Attoyac Bayou in Rusk, Nacogdoches, San Augustine, and Shelby Counties; Leon River Watershed below Proctor Lake and above Belton Lake in Comanche, Hamilton, Erath, Coryell, Mills and Bell Counties; Double Bayou Watershed in Liberty and Chambers Counties; Navasota River (below Lake Limestone) Watershed in Limestone, Robertson, Madison and Grimes Counties; Mill Creek Watershed in Austin and Washington Counties; Copano Bay, Mission and Aransas River Watershed in Nueces, San Patricio, Jim Wells and Live Oak Counties.					
	Start Date	Month 1		Completion Date	Month 49	
Subtask 2.3	Texas A&M Natural Resources Institute will actively market watershed-based feral hog education trainings through news releases (AgriLife Communications), internet postings, newsletter announcements, public/conference presentations, flyers, etc. TSSWCB must review and approve all project-related content in any materials prior to distribution.					
	Start Date	Month 1		Completion Date	Month 49	
Subtask 2.4	Texas A&M Natural Resources Institute will deliver at least three, 4-hour and nine, 1-hour feral hog education training events in selected watersheds, annually. Texas A&M Natural Resources Institute will be working closely with our colleagues conducting Lone Star Healthy Streams (LSHS) and Texas Water Resources Institute (TWRI) to share educational resources for delivery to constituents. Resources will be incorporated into overarching LSHS programming.					
	Start Date	Month 1		Completion Date	Month 49	
Subtask 2.5	At least 1 new publication (hardcopy or electronic) and 3 new videos, annually. Publications will be produced and made available to the public through social media outlets commonly used in extension programming.					
	Start Date	Month 1		Completion Date	Month 49	

Subtask 2.6	Project personnel will attend and participate in prioritized meetings, as appropriate, in order to communicate project goals, activities and accomplishments to affected parties. Such meetings may include, but are not limited to, Clean Rivers Program Basin Steering Committees, the Texas Watershed Planning Short Course, Texas Watershed Coordinator Roundtables, the TSSWCB Regional Watershed Coordination Steering Committee, and the annual meeting of Texas Soil and Water Conservation District Directors.			
	Start Date	Month 1	Completion Date	Month 49
Subtask 2.7	Texas A&M Natural Resources Institute will promote and utilize an online reporting system with the NRI wild pig website as developed through TSSWCB project 14-12 <i>Statewide Delivery of Lone Star Healthy Streams Feral Hog Component and Providing Technical Assistance on Feral Hog Management in Priority Watersheds</i> to document sightings of wild pig activities and/or damage. NRI will report metrics on wild pig damages, observations and activities conducted by cooperating landowners in priority areas as identified in the WPP and with guidance from the NRI website reporting system.			
	Start Date	Month 1	Completion Date	Month 49
Deliverables	<ul style="list-style-type: none"> List of specific watersheds where feral hog trainings have been implemented Schedules, agendas, meeting materials, and attendance lists for feral hog education trainings Press releases, newspaper articles, newsletters, public information statements, etc., as developed and disseminated Activity assessment for online reporting system included in each QPR and in Final Report Summary of landowner management efforts in priority watersheds included in each QPR and in Final Report 			

Tasks, Objectives and Schedules						
Task 3	Evaluate the effectiveness of the watershed-based feral hog education trainings.					
Costs	Federal	\$43,298	Non-Federal	\$28,766	Total	\$72,064
Objective	To measure both knowledge gained and plans for practice adoption of individuals participating in the program.					
Subtask 3.1	Texas A&M Natural Resources Institute will administer a post-test retrospective evaluation instrument to evaluate increased knowledge gained, dollars saved and plans for practice adoption by individuals within the selected watersheds to evaluate participant satisfaction with the program, and to evaluate participant's intentions to adopt abatement practices.					
	Start Date	Month 1	Completion Date	Month 49		
Subtask 3.2	Texas A&M Natural Resources Institute will analyze results obtained from evaluations using standard statistical procedures. Results will be incorporated into the Final Report and shared with County Extension Agents.					
	Start Date	Month 1	Completion Date	Month 49		
Deliverables	<ul style="list-style-type: none"> Post-test retrospective evaluations for feral hog educational trainings. Results from evaluations included in the final report. 					

Tasks, Objectives and Schedules						
Task 4	Distribute and manage computer-based training					
Costs	Federal	\$142,883	Non-Federal	\$94,930	Total	\$237,813
Objective	To use social media and web-based outlets to convey feral hog management information to clientele					
Subtask 4.1	Texas A&M Natural Resources Institute (NRI) will use web-sites like Wild Wonderings Blog, NRI's YouTube Channel, NRI's blog, NRI's wild pig website, Lone Star Healthy Streams and others to distribute promotional material, news releases, videos, and extension articles. Texas A&M Natural Resources Institute social media outlets are assessed with Google Analytics or similar features. Texas A&M Natural Resources Institute will report metrics such as the number of visitors, unique visitors, page views, video views, and reads that indicate use by clientele.					
	Start Date	Month 1		Completion Date	Month 49	
Deliverables	<ul style="list-style-type: none"> Results of information delivered through social media outlets. 					

EPA State Categorical Program Grants – Workplan Essential Elements FY 2018-2022 EPA Strategic Plan Reference
Strategic Plan Goal – Goal 1 Core Mission
Strategic Plan Objective – Objective 1.2 Provide for Clean and Safe Water

Project Goals (Expand from Summary Page)
<ul style="list-style-type: none"> Facilitate statewide implementation of the feral hog damage management education program through watershed-based group trainings. Increase stakeholder involvement in abatement of feral hogs and their damage to aid WPP and/or TMDL implementation or development processes by educating local citizens. Promote healthy watersheds by increasing citizen awareness, understanding, and knowledge about the potential impairments caused by non-native invasive feral hogs and the abatement practices to reduce their numbers that should minimize NPS pollution. Enhance watershed education across the State as it relates to the reduction of feral hog damage in Texas. Enhance learning opportunities for watershed education across the state and establish a larger, more well-informed citizen base. Empower individuals and communities to find creative solutions to improve watershed health by properly managing populations of the non-native invasive feral hog.

Measures of Success (Expand from Summary Page)
<ul style="list-style-type: none"> Deliver a minimum of 12 watershed-based feral hog education trainings annually in selected watersheds (three 4-hour and nine 1-hour programs per year) Numbers of citizens (represented by contact hours) participating in watershed-based feral hog education trainings Increased knowledge gained and plans to adopt abatement practices by individuals participating in the program, as measured by post-test retrospective evaluations

2012 Texas NPS Management Program Reference (Expand from Summary Page)

Components, Goals, and Objectives

Component 1 – Explicit short- and long-term goals, objectives and strategies that protect surface...water

LTG: To protect and restore water quality from NPS pollution through assessment, implementation and education

1. Focus NPS abatement efforts ...and available resources in watersheds identified as impacted by NPS pollution.
2. Support the implementation of state, regional, and local programs to prevent NPS pollution through assessment ...and education.
3. Develop partnerships, [and] relationships ...to facilitate collective, cooperative approaches to manage NPS pollution.
4. Increase overall public awareness of NPS issues and prevention activities.

STG 3– Education: Conduct education and technology transfer activities to help increase awareness of NPS pollution and prevention activities contributing to the degradation of waterbodies... by NPS.

- Objective A – Enhance existing outreach programs at the state, regional, and local levels to maximize the effectiveness of NPS education.
- Objective B – Administer programs to educate citizens about water quality and their potential role in causing NPS pollution.

Objective F – Implement public outreach and education to maintain and restore water quality in waterbodies impacted by NPS pollution.

Component 2 – Working partnerships and linkages to appropriate state, interstate, tribal, regional, and local entities, private sector groups, and Federal agencies.

Component 3 – Balanced approach that emphasizes both statewide NPS programs and on-the-ground management of individual watersheds

Part III – Financial Information

Budget Summary				
Federal	\$	432,978	% of total project	60%
Non-Federal	\$	287,666	% of total project	40%
Total	\$	720,644	Total	100%
Category		Federal	Non-Federal	Total
Personnel	\$	271,171	\$ 144,893	\$ 416,064
Fringe Benefits	\$	85,885	\$ 34,512	\$ 120,397
Travel	\$	9,520	\$ 0	\$ 9,520
Equipment	\$	0	\$ 0	\$ 0
Supplies	\$	7,118	\$ 0	\$ 7,118
Contractual	\$	0	\$ 0	\$ 0
Construction	\$	0	\$ 0	\$ 0
Other	\$	2,809	\$ 0	\$ 2,809
Total Direct Costs	\$	376,503	\$ 179,405	\$ 555,908
Indirect Costs (≤ 15%)	\$	56,475	\$ 51,785	\$ 108,260
Unrecovered IDC	\$	0	\$ 56,476	\$ 56,476
Total Project Costs	\$	432,978	\$ 287,666	\$ 720,644

Budget Justification (Federal)		
Category	Total Amount	Justification
Personnel	\$ 271,171	Principal Investigator – \$146,309 @ 3.0 months (\$38,816) Co-Principal Investigator 2 – no salary requested Program Coordinator (Yrs. 1 & 2) – \$51,355 @ 24 months (\$104,251) (Yr. 3) - \$54,531 @ 9.42 months (\$42,807) Program Coordinator – \$44,910 @ 4.71 months (\$18,170). Program Coordinator – \$42,011 @ 4.02 months (\$14,497). Program Manager - \$76,778 @ 1.58 months (\$10,431). Communications Manager – \$52,000 @ 3.0 months (\$13,393) Student workers – up to 3 x \$14.12/hour x 20 hours/week x 23.6 months (\$28,806) *named positions are budgeted with a 3% annual pay increase in all years; TBD positions and graduate students are budgeted with a 3% pay increase in years after year 1 *(Salary estimates are based on average monthly percent effort for the entire contract. Actual percent effort may vary more or less than estimated between months; but in the aggregate, will not exceed total effort estimates for the entire project.)
Fringe Benefits	\$ 85,885	Salaried Employee Fringe Benefits are calculated at: 0.188 * salary + \$825/mo. insurance. Graduate Student Fringe Benefits Calculated at: 0.011 * salary + \$825/mo. insurance. Fringe benefits cover FICA, UCI, WCI, and retirement. Undergraduate student fringe benefits are calculated at 0.11 * salary. (Fringe benefits estimates are based on salary estimates listed. Actual fringe benefits will vary between months coinciding with percent effort variations; but in the aggregate, will not exceed the overall estimated total.)
Travel	\$ 9,520	50 trips (average trip 245 mi/trip x 0.55 cost/mi) = \$6,738 + 13 trips x 1 night/trip *96 state rate hotels = \$1,248 + 13 trips x 2 days*59/day = \$1,534
Equipment	\$ 0	N/A
Supplies	\$ 7,118	Laptop computers and accessories
Contractual*	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 2,809	NRI wild pig website maintenance for 48 months - \$2,769 Conference Registration - \$40
Indirect	\$ 56,475	Reimbursable indirect costs are limited to no more than 15% of total federal direct costs. State the rate and the base costs associated with the rate. Generally, indirect costs are based on Personnel, Fringe Benefits, Travel, Supplies, Other and up to \$25,000 of each subcontract.

Budget Justification (Non-Federal)		
Category	Total Amount	Justification
Personnel	\$ 144,893	Principal Investigator – \$50,636 (11% for yrs. 1-1; 10.62% yr. 3) Co-Principal Investigator - \$94,257 (13.43% for yr. 1; 13.71% for yr. 2; 13.70% for yr. 3)
Fringe Benefits	\$ 34,512	Salaried Employee Fringe Benefits Calculated at: $0.188 * \text{salary} + \$825/\text{mo.}$ insurance. Fringe benefits cover FICA, UCI, WCI, and retirement. (Fringe benefits estimates are based on salary estimates listed. Actual fringe benefits will vary between months coinciding with percent effort variations; but in the aggregate, will not exceed the overall estimated total.)
Travel	\$ 0	N/A
Equipment	\$ 0	N/A
Supplies	\$ 0	N/A
Contractual*	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 0	N/A
Indirect	\$ 51,785	The entity may claim additional match through unrecovered indirect costs waived for the federal reimbursement. Generally, this is done by calculating the difference between the standard indirect rate of the entity and the reduced rate of 15% for federal costs. Itemize the indirect costs for the non-federal match and the unrecovered indirect costs for the federal portion separately.
Indirect Unrecovered	\$ 56,476	15% Unrecovered