Texas State Soil and Water Conservation Board
Clean Water Act §319(h) Nonpoint Source Grant Program
FY 2012 Workplan 12-07

SUMMARY PAGE	
Title of Project	Statewide Delivery of Riparian and Stream Ecosystem Education Program
Project Goals	• Facilitate the promotion of healthy watersheds and improve water quality through the delivery of riparian and stream ecosystem education programs with a focus on priority watersheds. • Increase citizen awareness, understanding, and knowledge about the nature and function of riparian zones, their benefits, and BMPs to protect them and minimize NPS pollution. • Enhance interactive learning opportunities for riparian education across the state and establish a larger, more well-informed citizen base working to improve and protect local riparian and stream ecosystems. • Connect landowners with local technical and financial resources to improve management and promote healthy watershed and riparian areas on their land.
Project Tasks	(1) Project Administration; (2) Deliver riparian education programs; (3) Deliver web-based education resources; (4) Evaluate the effectiveness of education programs
Measures of Success	• Deliver a minimum of 25 riparian education programs to 550 participants in prioritized watersheds • Coordinate 3 Proper Functioning Condition (PFC) trainings to agency personnel • Coordinate 2 Statewide riparian conferences • Increased knowledge and understanding of riparian function and implementation of BMPs by individuals participating in the program, as measured by pre-/post-tests and 6-month follow-up evaluation
Project Type	Implementation ( ); Education (X); Planning ( ); Assessment ( ); Groundwater ( )

<table>
<tr><td>Status of Waterbody on 2010 Texas Water Quality Inventory and 303(d) List</td><td colspan="5"><table>
<tr><th>Segment ID:</th><th>Parameter</th><th>Category</th></tr>
<tr><td>0818</td><td>pH</td><td>5c</td></tr>
<tr><td>1103</td><td>Bacteria</td><td>5a</td></tr>
<tr><td></td><td>Depressed DO</td><td>5a</td></tr>
<tr><td>1103A</td><td>Bacteria</td><td>5a</td></tr>
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<tr><td></td><td>Depressed DO</td><td>5c</td></tr>
<tr><td>1103D</td><td>Bacteria</td><td>5c</td></tr>
<tr><td>1103E</td><td>Bacteria</td><td>5b</td></tr>
<tr><td>1104</td><td>Bacteria</td><td>5a</td></tr>
<tr><td></td><td>Depressed DO</td><td>5c</td></tr>
<tr><td>1804A</td><td>Bacteria</td><td>5c</td></tr>
<tr><td>1428C</td><td>Bacteria</td><td>4a</td></tr>
<tr><td>1217B</td><td>Depressed DO</td><td>5c</td></tr>
<tr><td>1217D</td><td>Depressed DO</td><td>5b</td></tr>
<tr><td>1009E</td><td>Bacteria</td><td>5a</td></tr>
<tr><td>2311</td><td>Depressed DO</td><td>5c</td></tr>
<tr><td>1810</td><td>Bacteria</td><td>4a</td></tr>
<tr><td>1301</td><td>Bacteria</td><td>5c</td></tr>
<tr><td>1302</td><td>Bacteria</td><td>5b</td></tr>
<tr><td>1302A</td><td>Bacteria</td><td>5b</td></tr>
<tr><td>1302B</td><td>Bacteria</td><td>5b</td></tr>
<tr><td></td><td>Depressed DO</td><td>5c</td></tr>
</table></td></tr>
<tr><td>Project Location (Statewide or Watershed and County)</td><td colspan="5">Buck Creek Watershed in Childress, Collingsworth and Donley Counties; Cedar Creek Watershed in Henderson, Kaufman, Rockwall and Van Zandt Counties; Dickinson Bayou in Brazoria and Galveston Counties; Geronimo Creek Watershed in Guadalupe and Comal Counties; Gilleland Creek in Travis County; Hickory Creek in Denton County; Lampasas River Watershed in Bell, Burnet, Coryell, Hamilton, Lampasas, Mills, and Williamson Counties; Little Cypress Creek Watershed within Harris County; Pecos River Watershed in Texas in Crane, Crockett, Pecos, Reeves, Terrell, Upton, and Ward Counties; Plum Creek Watershed in Caldwell, Hays, and Travis Counties; San Bernard River Watershed in Austin, Colorado, Wharton, Fort Bend, and Brazoria Counties; Upper Llano River watershed in Edwards, Kerr, Kimble, Menard, Real, and Sutton Counties</td></tr>
<tr><td>Key Project Activities</td><td colspan="5">Hire Staff (X); Surface Water Quality Monitoring ( ); Technical Assistance ( ); Education (X); Implementation ( ); BMP Effectiveness Monitoring ( ); Demonstration ( ); Planning ( ); Modeling ( ); Bacterial Source Tracking ( ); Other ( )</td></tr>
<tr><td>Texas NPS Management Program Elements</td><td colspan="5">• Element One – LTGs 1, 2, 4
• Element One – STGs 3A, 3B, 3F
• Elements Two & Three</td></tr>
<tr><td>Project Costs</td><td>Federal</td><td>$370,941</td><td>Non-Federal</td><td>$247,324</td><td>Total</td><td>$618,265</td></tr>
<tr><td>Project Management</td><td colspan="5">• Texas Water Resources Institute/Texas A&M Institute of Renewable Natural Resources</td></tr>
<tr><td>Project Period</td><td colspan="5">October 1, 2012 – September 30, 2015</td></tr>
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Part I – Applicant Information

Applicant							
Project Lead	Dr. Kevin Wagner						
Title	Associate Director						
Organization	Texas Water Resources Institute / Texas A&M Institute of Renewable Natural Resources						
E-mail Address	klwagner@ag.tamu.edu						
Street Address	2118 TAMU						
City	College Station	County	Brazos	State	Texas	Zip Code	77843-2118
Telephone Number	979-845-2649			Fax Number	979-845-8554		

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 Water Resources Institute/Texas A&M Institute of Renewable Natural Resources (TWRI/IRNR)	Provide overall program management including project coordination, submission of quarterly and final reports, delivery of riparian education programs, website development and management, distribution and support of web-based information, and evaluation of program effectiveness.
Texas A&M Forest Service (TFS)	Riparian Team Member: Assist with program development, marketing, and delivery
Texas A&M AgriLife Research – Ecosystem Science and Management Dept. (ESSM)	Riparian Team Member: Assist with program development, marketing & delivery
Texas Parks and Wildlife Department (TPWD)	Riparian Team Member: Assist with program development, marketing & delivery
Nueces River Authority (NRA)	Riparian Team Member: Develop web-based education programs & resources; assist with program development, marketing, and delivery.
USDA-Natural Resource Conservation Service (NRCS)	Riparian Team Member: Assist with program development, marketing, and delivery
Texas Riparian Association (TRA)	Riparian Team Member: Assist with program development, marketing, and delivery
Texas Tech University Llano River Field Station (TTU-LRFS)	Riparian Team Member: Assist with program development, marketing, and delivery

Part II – Project Information

Project Type							
Surface Water	X	Groundwater					
Does the project implement recommendations made in (a) a completed WPP, (b) an adopted TMDL, (c) an approved I-Plan, or (d) a Comprehensive Conservation and Management Plan developed under CWA §320?				Yes	X	No	
If yes, identify the document.	Draft Buck Creek Watershed Protection Plan; Eight Total Maximum Daily Loads for Indicator Bacteria in Dickinson Bayou and Three Tidal Tributaries; Draft Geronimo and Alligator Creeks Watershed Protection Plan; Implementation Plan for One Total Maximum Daily Load for Bacteria in Gilleland Creek; Report for Task 2, Watershed Protection Plan, of the Grant Entitled Control of Nonpoint Source Loads in the Hickory Creek Sub-basin of the Lake Lewisville Watershed as a Component of a Watershed-Based Water Quality Trading Program; Fifteen TMDLs for Indicator Bacteria in Watersheds of the Lake Houston Area; A Watershed Protection Plan for the Pecos River in Texas; Plum Creek Watershed Protection Plan; San Bernard River Watershed Protection Plan					
If yes, identify the agency/group that developed and/or approved the document.	Buck Creek Watershed Partnership facilitated by Texas Water Resources Institute and TSSWCB; 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 City of Denton in cooperation with CH2M HILL, Texas A&M University, and the University of North Texas; TCEQ and James Miertschin & Associates, Inc.; Landowners and entities in the Pecos River watershed, facilitated by AgriLife Extension, TWRI and TSSWCB; Plum Creek Watershed Partnership facilitated by Texas AgriLife Extension Service and TSSWCB; Houston-Galveston Area Council and TCEQ	Year Developed	2012; 2012, 2012, 2007, 2008; 2011; 2008; 2008; 2011			

Watershed Information				
Watershed Name(s)	Hydrologic Unit Code (12Digit)	Segment ID	305(b) Category	Size (Acres)
Buck Creek	111201050204, 111201050208, 111201050303, 111201050305 – 111201050307, 111201050401 – 111201050407, 111201050501 – 111201050502	0207A	2	187,270
Cedar Creek	120301070101 – 120301070111; 120301070201 – 120301070206; 120301070301 - 120301070310	0818	5c	675,788
Dickinson Bayou	120402040200	1103	5a	63,287
Geronimo Creek (including its tributary, Alligator Creek)	121002020110, 121002020111	1804A	5c	44,152
Gilleland Creek	120903010106	1428C	4a	52,866
Hickory Creek – Tributary to Lewisville Lake	120301030804	0823	Not Assessed	110,634
Lampasas River (Lampasas River above Stillhouse Hollow Lake, Rocky Creek, Sulphur Creek, Simms Creek)	120702030101 – 120702030509	1217 1217A 1217B 1217C	5c 2 2 2	839,800
Little Cypress Creek	120401020105	1009E	5a	34,687

Pecos River	130700010201 - 130700010207; 130700010301 - 130700010305 130700010401 - 130700010408; 130700010503 - 130700010506 130700010601 - 130700010605; 130700010701 - 130700010705 130700010801 - 130700010803; 130700010901 - 130700010906 130700011001 - 130700011006; 130700030101 - 130700030106 130700030201 - 130700030204; 130700030301 - 130700030308 130700030401 - 130700030403; 130700040101 - 130700040106 130700040301 - 130700040305; 130700040401 - 130700040406 130700040501 - 130700040506; 130700040601 - 130700040605 130700040701 - 130700040705; 130700040801 - 130700040806 130700050101 - 130700050106; 130700050201 - 130700050205 130700050301 - 130700050304; 130700060101 - 130700060105 130700060201 - 130700060206; 130700060301 - 130700060306 130700060401 - 130700060405; 130700060501 - 130700060506			

Plum Creek	110901050702, 110901050703, 111002030102, 111301050208, 111302090204, 120100040204, 120301010104, 120500030306, 120601020401, 120702010804, 120702010805, 120800020403, 121002030401 – 121002030403	1810	4b	288,240
San Bernard River	120904010101, 120904010102, 120904010104, 120904010109, 120904010205, 120904010207, 120904010302, 120904010304 – 120904010306, 120904010308	1301 1302 1302A 1302B	5c 5a 5c 5c	672,000
Upper Llano	120902020101 – 120902020109; 120902020201 – 120902020206	1415	1	1,209,850

Water Quality Impairment

Describe all known causes (pollutants of concern) of water quality impairments or concerns from any of the following sources: *2010 Texas Integrated Report*, Clean Rivers Program Basin Summary/Highlights Reports or other documented sources.

Segment ID	Body Name	Impairment	Code
0818	Cedar Creek Reservoir	pH	5c
1103	Dickinson Bayou Tidal	Bacteria	5a
		Depressed DO	5a
1103A	Bensons Bayou	Bacteria	5a
1103B	Bordens Gully	Bacteria	5a
1103C	Geisler Bayou	Bacteria	5a
		Depressed DO	5c
1103D	Gum Bayou	Bacteria	5c
1103E	Cedar Creek	Bacteria	5b
1104	Dickinson Bayou Above Tidal	Bacteria	5a
		Depressed DO	5c
1804A	Geronimo Creek	Bacteria	5c
1428C	Gilleland Creek	Bacteria	4a
1009E	Little Cypress Creek	Bacteria	5a
2311	Upper Pecos River	Depressed DO	5c

1810	Plum Creek	Bacteria	4b
1217B	Sulphur Creek	Depressed DO	5c
1217D	North Fork Rocky Creek	Depressed DO	5b
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 DO	5c
Water Quality Concerns			
0207A	Buck Creek	Nitrate	CS
1103	Dickinson Bayou Tidal	Chlorophyll-a	CS
		Depressed DO	CS
1103B	Bordens Gulley	Depressed DO	CS
1103C	Geisler Bayou	Depressed DO	CS
1103D	Gum Bayou	Bacteria	CN
1103E	Cedar Creek	Depressed DO	CS
1104	Dickinson Bayou Above Tidal	Depressed DO	CS
1804A	Geronimo Creek	Nitrate	CS
1428C	Gilleland Creek	Bacteria	CN
		Nitrate	CS
		Orthophosphorus	CS
1009E	Little Cypress Creek	Nitrate	CS
		Orthophosphorus	CS
		Total phosphorus	CS
1217B	Sulphur Creek	Depressed DO	CS
2311	Upper Pecos River	Bacteria	CN
		Chlorophyll-a	CS
		Depressed DO	CS
		Golden alga	CN
1810	Plum Creek	Depressed DO	CS
		Nitrate	CS
		Orthophosphorus	CS
		Total phosphorus	CS
1301	San Bernard River Tidal	Chlorophyll-a	CS
1302	San Bernard River Above Tidal	Depressed DO	CS
1302A	Gum Tree Branch	Bacteria	CN
		Depressed DO	CS
1302B	West Bernard Creek	Depressed DO	CS
Special Interest			
0207A	Buck Creek	Bacteria	WAP
-	Hickory Creek	-	WAP
1217	Lampasas River Above Stillhouse Hollow Lake	Bacteria	WAP
1415	Upper Llano		WAP

Project Narrative

Problem/Need Statement

Riparian degradation is a major threat to water quality, in-stream habitat, terrestrial wildlife, aquatic species, and overall stream health. Conversely, proper management, protection, and restoration of riparian areas decrease bacteria, nutrient, and sediment loadings to waterbodies; lower in-stream temperatures; improve dissolved oxygen levels; improve aquatic habitat; and ultimately improves macrobenthos and fish community integrity. Elevated bacteria, low dissolved oxygen, and degraded habitat and aquatic communities account for 70% of the impairments (436 of the 621) on the *2010 Texas Integrated Report*.

To improve the management of these sensitive and vital ecosystems, riparian education programs are needed regarding the nature and function of riparian zones, their benefits, and BMPs for protecting them. This will not only reduce NPS pollution, it will provide tremendous ecosystem service benefits and direct economic benefits to the community.

The State of Texas has more than 200,000 miles of rivers and streams that, along with closely associated floodplain and upland areas, comprise corridors of great economic, social, cultural, and environmental value. These riparian corridors are complex ecosystems that include the land, plants, animals, and network of streams within them. They perform a number of ecological functions such as modulating streamflow, storing water, removing harmful materials from water, and providing habitat for aquatic and terrestrial plants and animals. Simply put, the health of riparian systems is paramount to stream health.

Streams and riparian zones reflect the sum of impacts of natural and man-induced disturbances of drainage areas or watersheds. Management of the land, streams, and riparian zones affects not only individual landowners, but also livestock, wildlife, aquatic life and ecosystem services for everyone downstream. By understanding the processes, key indicators and impacts of disturbances, activities that hinder recovery, landowners and other citizen-stakeholders can evaluate these systems and improve their management to produce desired conditions.

Changes within a surrounding ecosystem (e.g., watershed) will impact the physical, chemical, and biological processes occurring within a stream corridor. Stream systems normally function within natural ranges of flow, sediment movement, temperature, and other variables, in “dynamic equilibrium.” Over the years, human activities have contributed to changes in the dynamic equilibrium of stream systems. These activities have manipulated stream corridor systems for a wide variety of purposes, including domestic and industrial water supplies, irrigation, transportation, hydropower, waste disposal, mining, flood control, timber management, recreation, aesthetics, and fish and wildlife habitat. Increases in human population along with industrial, commercial, and residential development place heavy demands on stream corridors. The cumulative effects of these activities result in significant direct and indirect changes, not only to stream corridors, but also to the ecosystems or watersheds they are located in. The direct changes include degradation of water quality, decreased water storage and conveyance capacity, loss of habitat for fish and wildlife, and decreased recreational and aesthetic values. While the indirect changes are harder to quantify such as air quality, decomposition of wastes, and other ecosystem services we all take for granted, there is direct economic benefits that can be calculated. Many cities, such as Austin, have found that improving creek and floodplain protection is needed to prevent unsustainable public expense to maintain drainage infrastructure.

Benefits of healthy riparian/stream systems:

- High quality habitat for both aquatic and riparian species
- Dissipation of flood energy and reduced downstream flood intensity and frequency
- Higher, longer-lasting and less variable baseflow between storm events
- Deposition of sediment in the floodplain, stabilizing it and maintaining downstream reservoir capacity longer
- Debris and nutrient use and filtering in the floodplain to improve water quality and dissolved oxygen levels in the aquatic system
- Riparian vegetation canopies to shade streams and reduce their temperatures, providing a food base for aquatic

and riparian fauna
- Fewer invasions of exotic undesirable riparian species
- Higher biodiversity than terrestrial uplands
- "Stabilized" banks, which reduce erosion and protect ownership boundaries
- Increased economic value through wildlife, livestock, timber, and recreational enterprises
- Improved rural land aesthetics and real estate values

Riparian education workshops have been offered in the past by agencies such as Texas A&M AgriLife Extension Service (e.g. Trinity River basin), Texas A&M AgriLife Research (e.g. Lampasas River), TRA, and most recently the Nueces River Authority in conjunction with TPWD utilizing NRCS experts as instructors. These workshops have received tremendous interest in both the Nueces River Basin and Plum Creek and Lampasas River watersheds, attracting 50-120 participants. A successful workshop format has already been established and field tested. Feedback from these workshops has been very positive. Further, TPWD is initiating a statewide riparian education effort; however, offerings will be limited to approximately 4/yr targeting areas where there are additional habitat programs. This program will coordinate closely with TPWD on both delivery and content to ensure landowners throughout the state are provided a consistent message of riparian enhancement and protection. Additionally, groups like the Stream Teams coordinated by Texas A&M AgriLife Research at Blackland Research and Extension Center and the North Central Texas Council of Governments and USEPA-R6 were focused on providing technical assistance through consultations and recommendations, informal project review and ordinance review, and also worked to improve public awareness of the benefits of healthy streams and riparian areas through a geomorphology training workshops directed to local officials, city engineers, developers and consultants. The funding for these Stream Team efforts ended several years ago, but the structure is still in place to provide technical assistance as needed. Also, groups like TCU periodically host riparian education workshops such as the upcoming 2012 workshop titled "Restoration and Management of Riparian Corridors" and the 2011 Conference on riparian area restoration held at TCU for governments, agencies, and consultants (https://lifelong.is.tcu.edu/wconnect/CourseStatus.awp?~~10CTSRCA).

Riparian management is an important component of the Lone Star Healthy Streams program (TSSWCB 09-06 and 12-08). However, riparian management is not the focal point of Lone Star Healthy Streams which specifically targets BMPs for addressing bacteria contributions to streams (of which proper riparian management is one); but, it does not focus on the broader perspective of the nature and function of riparian zones (fluvial geomorphology, hydrology, vegetation) or the benefits and direct economic impacts from ecological services of healthy riparian zones.

Unfortunately, these programs cannot comprehensively meet the diverse needs of the entire state, and in many cases they lack funding to continue efforts even at the local scale. An evaluation of the NRA Riparian Network by Oregon State University concluded that barriers to continued program operation and improvements included limited staff time and availability to support the program, a limited number of riparian experts in the region available to facilitate workshops, and lack of secure funding. Chief among these barriers was the lack of a continuous, dedicated funding source.

Further, there lacks a unifying and overarching linkage to the myriad of educational workshops and conferences focused on riparian education. There is a critical need to create synergy between the framework established by these programs and efforts. This project will create this synergy and build off of these successful local programs to establish the State's mechanism to deliver riparian education in high priority watersheds. This project will implement a riparian education program to support and enhance riparian management and water quality protection efforts by all agencies and organizations actively engaged in watershed planning across Texas. This program will benefit watershed efforts regardless of constituent targeted or whether the watershed is urban or rural. Further, by protecting these ecologically sensitive riparian areas, communities will be able to improve water quality while maintaining healthy ecosystems, providing wildlife habitat, opportunities for outdoor recreation and enhanced ecosystem services.

Project Narrative

General Project Description (Include Project Location Map)

TWRI will work through this project to include the delivery of daylong riparian education programs by conducting riparian trainings in targeted watersheds and providing access to the program through web-based distance training tools delivered via web. TWRI/IRNR will coordinate a Riparian Team for this project composed of TFS, ESSM, TPWD, NRCS, TRA, NRA, TTU-LRFS, and others to assist with program development, marketing, and delivery. TWRI/IRNR will organize instructor teams for each event, composed of members of the Riparian Team, contractors, and others as needed to deliver the Riparian Education Programs.

This program will be built upon the successful efforts and lessons learned through the Riparian Landowners' Network which was designed and implemented by the NRA. Contributions and guidance from NRA based on their delivery of more than 30 workshops will provide a firm foundation for this project's efforts and allow a quick start for this program propelling this project to success. Further, as NRA continues to develop resources for landowners in their basin, this project will work closely with them to coordinate and expand the reach and audience for their resources.

As utilized for NRA riparian workshops, a 3-4 person team will be used to provide each training program. The basic existing framework established by NRA and other past trainings will be utilized and expanded upon where possible. The morning session will include registration and pre-test, followed by indoor classroom style presentations. During lunch additional presentations may be provided that relate to the issues and or landscape for the area. The afternoon training session will be outside at one or more stream locations, where participants can see in the field firsthand the vegetation and functions they learned about in the classroom setting. One group will perform the stream walk instruction and the other will have additional discussions/presentations about stream functions and dynamics, flooding, etc. Each group will then switch and conduct the other task.

The program will be adapted to meet local needs. For example, the program will be adapted in coordination with the Riparian Team for urban areas as needed. TFS will be integral for both adapting the program and delivering it in East Texas. Due to logging activities in this region and specific requirements placed on such operations, the program will be adapted in coordination with the TFS to meet the needs of landowners and issues these logging areas and ensure consistency with existing logger training programs. Further, TFS is the recognized expert in Texas with regards to bottomland hardwood forests and their vegetation and management. As these bottomland forests are vital to riparian protection and improvements, the TFS expertise will be needed to ensure the program retains the needed expertise to appropriately manage these critical systems.

To help market the program and further expand the reach of the program, presentations of varying length (15/30/45/60 min.) will be developed and delivered to audiences throughout the state through county Extension programs, watershed stakeholder meetings, Clean Rivers Program Basin Steering committees, and other venues. These presentations will be available for delivery by anyone on the Riparian Team. Additionally, key elements and messages will be incorporated into presentations delivered by the TFS Program Coordinator, TWRI, and others on the Riparian Team throughout the state to generate greater interest in riparian protection efforts and increasingly expand requests for the program and its resources. It is anticipated that this will greatly increase program momentum and concurrently initiate implementation of riparian protection concepts by landowners, setting the stage for greater improvements in riparian habitat, stream stability, and water quality.

The program will coordinate with the TFS, NRCS, TRA, River Authorities, local soil and water conservation districts (SWCDs), County Extension Agents (CEAs), and particularly the TPWD and its riparian programs. TWRI/IRNR will coordinate Riparian Team meetings/teleconferences for planning workshops and materials review approximately every 6 months.

Riparian Landowner Trainings. Riparian landowner trainings (one daylong, 5 in year 1 and 10 per year in years 2-3) will focus on the nature and function of riparian zones (fluvial geomorphology, hydrology, vegetation), the benefits and direct

economic impacts from ecological services of healthy riparian zones, BMPs for enhancing and protecting riparian zones, and technical and financial resources and incentives available for implementing riparian BMPs and riparian protection measures. Riparian education programs will cover an introduction to riparian principles, watershed processes, basic hydrology, erosion/deposition principles, riparian vegetation, potential causes of degradation and possible resulting impairment(s), and available local resources including technical assistance and tools that can be employed to prevent and/or resolve degradation. Existing resources and guides will be used for these trainings; however, where possible, regional information and curriculum will be developed. The goal is for participants to better understand and relate to riparian and watershed processes, the benefits that healthy riparian areas provide, and the tools that can be employed to prevent and/or resolve degradation and improve water quality. As a part of the training, participants will be educated on the importance of riparian protection activities. A major goal of the program will be to foster implementation of riparian BMPs. Training will also emphasize the need for watershed planning that supports maintenance of a natural hydrograph. Restoration of riparian areas degraded by changes to the natural hydrologic regime must be conducted in concert with efforts to remedy those upstream disturbances. At the conclusion of the training, participants will receive a certificate of completion.

TWRI/IRNR and the Riparian Team will work in concert with state and local organizations to select and schedule locations for the riparian education programs. Priority will be given to agencies and organizations currently involved in WPP or TMDL processes and those planning future watershed efforts (Fig. 1). Subsequently, additional watersheds will be selected based on impairment status, environmental sensitivity, and/or other priority issues. Due to the size of many watersheds in the state and in an effort to enhance outreach, riparian education programs, in both urban and rural settings, may be offered multiple times and at different locations within prioritized watersheds. Five workshops will be offered in year 1 and at least ten workshops will be conducted annually in years 2 and 3 in the highest priority watersheds.

Agency proper functioning condition trainings: Two 2-day training programs will be coordinated to provide detailed training on proper functioning condition for agency personnel including TPWD, NRCS, CEAs, TSSWCB, TFS, Texas Department of Transportation (TXDOT), Texas Commission on Environmental Quality (TCEQ), SWCDs, General Land Office (GLO), Texas Water Development Board (TWDB), River Authorities, U.S. Fish and Wildlife Service (USFWS), and Nonpoint Source (NPS) personnel. These will be led by the NRCS – Texas State Riparian Service Team and TPWD and coordinated by TWRI/IRNR.

Two Statewide Riparian Conferences will be held to provide additional riparian information to those interested. These may be held in conjunction with the TRA, professional societies, River Authorities, etc. These conferences will springboard from the momentum began by the NRA's Riparian Summit held in October 2011 in San Antonio with the National Riparian Service Team and multiple agencies, NGOs and landowners in attendance.

Web-Based Resources. In cooperation with this project, web-based resources will be developed by the Nueces River Authority with non-federal funding from several private foundations to deliver comprehensive riparian information. These will include voice-over PowerPoint presentations from the riparian landowner trainings, videos, and other resources designed to help K-12, nature groups, and landowners better understand the many functional benefits of our Texas riparian landscapes. Citizens unable to attend face-to-face events will be encouraged to utilize the web-based voice over PowerPoint presentation versions of the training. The NRA "Remarkable Riparian" website will be linked to the TWRI Water Resources Training Program website to increase program availability and accessibility.

Evaluation and Assessment. The face-to-face training and presentations will include an evaluation component to assess program effectiveness and to modify and enhance curriculum content to achieve project goals. A two-stage evaluation approach will be used to measure both knowledge and behavior changes of individuals participating in the program.

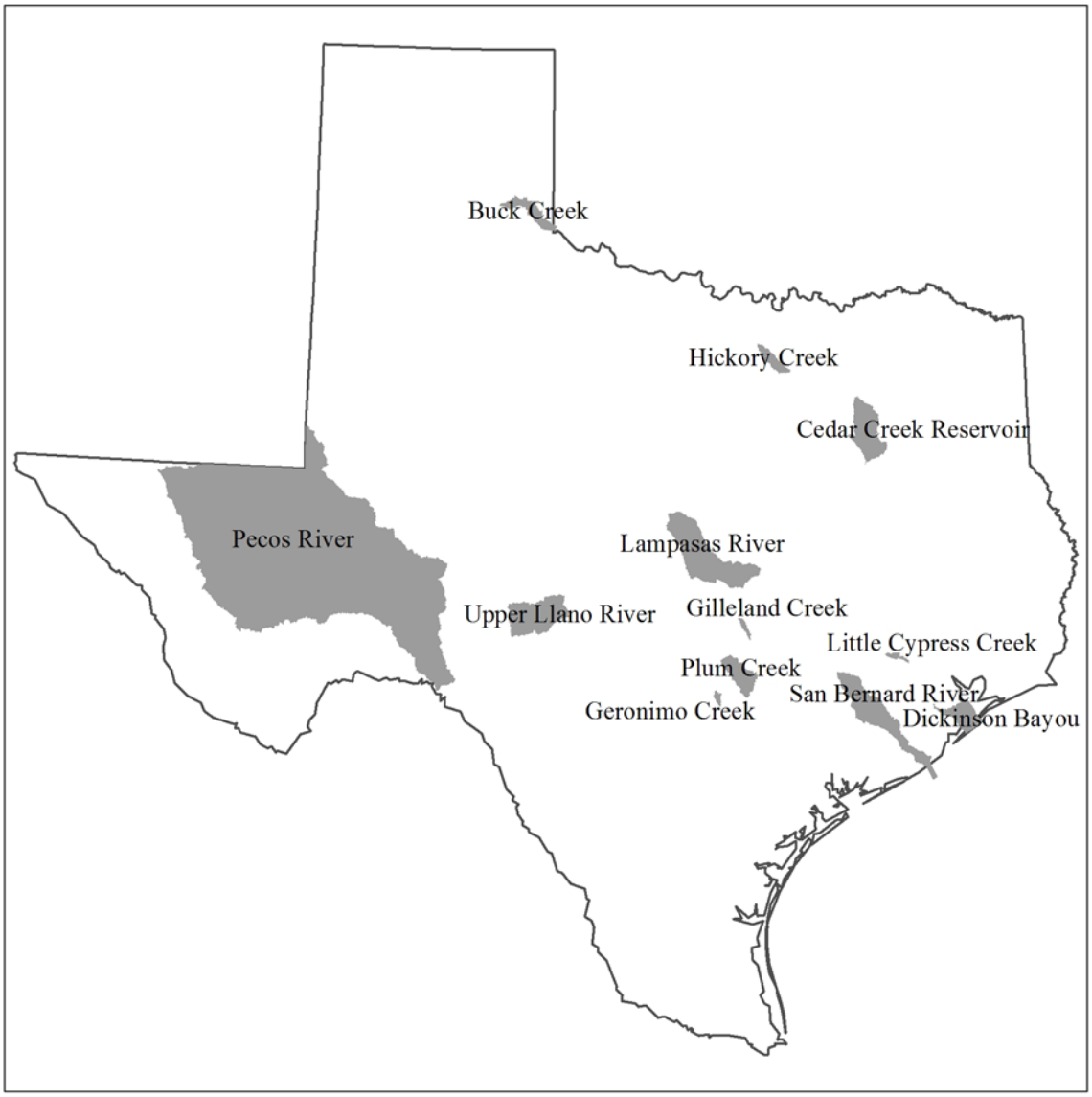
Stage 1. A pre-/post-test evaluation strategy will be implemented at the beginning and end of the face-to-face educational program. The pre-test will ask knowledge-based questions and post-test will measure the same knowledge-based questions to determine the knowledge increase of participants. In addition, the post-test will include 'satisfaction'

questions and 'intentions to change or adopt' questions.

Stage 2. A post six-month follow-up assessment instrument will also be sent to participants via email to complete the assessment and ascertain what practices were actually adopted six months after participating in the program.

Results will be summarized in a project final report. Briefs also may be developed to document and enhance the success of future riparian education and similar training programs.

Figure 1. Initial Priority Watersheds



Tasks, Objectives and Schedules

Task 1	Project Administration					
Costs	Federal	$18,000	Non-Federal	$12,000	Total	$30,000
Objective	Administer, coordinate and monitor all work performed under this project including technical and financial supervision and preparation of status and final reports.					
Subtask 1.1	TWRI/IRNR will prepare electronic quarterly progress reports (QPRs) for submission to TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 15th of January, April, July and October. QPRs shall be distributed to all project partners.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 1.2	TWRI/IRNR 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 36		
Subtask 1.3	TWRI/IRNR 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. TWRI/IRNR will develop lists of action items needed following each project coordination meeting and distribute to project personnel.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 1.4	TWRI/IRNR will attend and participate in 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, Texas Watershed Planning Short Course, Texas Watershed Coordinator Roundtables, and the TSSWCB Southeast and South Central Texas Regional Watershed Coordination Steering Committee.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 1.5	TWRI/IRNR will develop (Month 1-3), host and maintain (Months 4-36) a website to serve as a public clearinghouse for project-related information. This website will serve as a means to disseminate information to stakeholders and the general public.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 1.6	TWRI/IRNR will develop a final report covering all project activities.					
	Start Date	Month 31	Completion Date	Month 36		
Deliverables	• Quarterly progress reports in electronic format • Reimbursement Forms and necessary documentation in hard copy format • Lists of action items from project coordination meetings • Project website • Final Report in electronic and hard copy formats					

Tasks, Objectives and Schedules	
Task 2	Coordinate and deliver riparian education programs

Costs	Federal	$312,168	Non-Federal	$133,787	Total	$445,955
Objective	Deliver riparian education programs to targeted watersheds to promote healthy riparian areas, thus healthy watersheds, by increasing citizen awareness, understanding, and knowledge about the nature and function of riparian zones, their benefits, and BMPs for protecting them and minimize NPS pollution.					
Subtask 2.1	TWRI/IRNR will employ an Extension Program Specialist who will serve as the Riparian Education Program Coordinator and will be responsible for the general oversight and coordination of all project activities and for promoting, coordinating, and delivering riparian education training events and web-based tools. The Extension Program Specialist will attend trainings as necessary.					
	Start Date	Month 1	Completion Date	Month 3		
Subtask 2.2	TWRI/IRNR will establish a Riparian Team to direct this synergistic project. This Riparian Team will include TWRI/IRNR, ESSM, TFS, TPWD, NRA, NRCS, TRA, and TTU-LRFS. This Riparian Team will assist with program development, marketing, and delivery. This Riparian Team will serve as the primary pool of instructors to deliver the Riparian Education Program. The Riparian Team will meet as frequently as needed, likely quarterly in year 1 and semi-annually in years 2-3.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 2.3	The Extension Program Specialist will compile the amassed body of work utilized by the various entities for riparian workshops and conferences. In conjunction with the Riparian Team, the Extension Program Specialist will select the most appropriate educational materials and resources for use in identified priority watersheds. Although existing resources and guides will be used for trainings; where possible, regional information and curriculum will be developed by the Extension Program Specialist and Riparian Team. TFS will be integral for both adapting the program and delivering it in East Texas. NRA will be integral for adapting the program and delivering it in the Texas Hill Country and South Texas and providing the Riparian Team their valuable experience of program delivery in the Nueces watershed. As possible, TWRI/IRNR and the Riparian Team will work with cities to adapt the program for delivery in urban areas as well.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 2.4	TWRI/IRNR will work in concert with TSSWCB, TCEQ, TPWD, NRCS, TFS, and other state and local organizations to select locations for the riparian education training events. This project will deliver riparian education programs to targeted watersheds across the state. Priority watersheds will be selected in collaboration with TSSWCB, and with input from TCEQ and others, and primarily represent those with approved WPPs or TMDLs and those developing or planning development of WPPs or TMDLs. Initial priority shall be given to Buck Creek, Cedar Creek Reservoir, Dickinson Bayou, Geronimo Creek, Hickory Creek, Lampasas River, Pecos River, Plum Creek, San Bernard River, and Upper Llano River. 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. Additional watersheds will be selected based on impairment status, environmental sensitivity, and/or other priority issues. TWRI/IRNR and TSSWCB will periodically make collaborative decisions to re-prioritize and add to/remove from the list of watersheds.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 2.5	The Extension Program Specialist will work to establish CEU credits for the riparian education program to encourage participation by landowners and water resource professionals.					
	Start Date	Month 1	Completion Date	Month 12		
Subtask 2.6	TWRI/IRNR, with assistance of the Riparian Team, will actively market riparian education trainings through news releases (AgriLife News and local media outlets), internet postings, newsletter announcements, public/conference presentations, flyers, etc., to enhance awareness and utilization. TSSWCB must review and approve all project-related content in any materials prior to distribution.					
	Start Date	Month 3	Completion Date	Month 36		

<table>
<tr><td>Subtask 2.7</td><td colspan="4">TWRI/IRNR, with assistance of the Riparian Team, will deliver 25, daylong riparian education training events in prioritized watersheds (Subtask 2.4) during the project period. Five programs are planned for delivery in year 1 and 10 each year during years 2 and 3. Certificates of completion will be provided to all participants in the trainings.</td></tr>
<tr><td></td><td>Start Date</td><td>Month 6</td><td>Completion Date</td><td>Month 36</td></tr>
<tr><td>Subtask 2.8</td><td colspan="4">TWRI/IRNR in collaboration with the Riparian Team will develop a series of riparian education presentations of various lengths (15/30/45/60 min.) and provide them to a variety of audiences and venues statewide such as those listed in Subtask 1.4, but also including county and multi-county Extension programs, landowner workshops, SWCD programs, and other suitable venues. Further, key elements of the program will be incorporated into presentations delivered by TFS, TWRI/IRNR, and others on the Riparian Team and delivered to a variety of audiences throughout the state.</td></tr>
<tr><td></td><td>Start Date</td><td>Month 3</td><td>Completion Date</td><td>Month 36</td></tr>
<tr><td>Subtask 2.9</td><td colspan="4">TWRI/IRNR will coordinate two 2-day agency trainings on assessing proper functioning condition with the NRCS State Riparian Service Team and others. Proper functioning condition will be the topic of a pre-conference workshop at the SW Stream Restoration Conference in San Antonio, Tx in May 2014. These programs will provide detailed training on proper functioning condition for agency personnel including TPWD, NRCS, CEAs, TSSWCB, TXDOT, TCEQ, SWCDs, GLO, TWDB, River Authorities, USFWS, and NPS personnel.</td></tr>
<tr><td></td><td>Start Date</td><td>Month 13</td><td>Completion Date</td><td>Month 36</td></tr>
<tr><td>Subtask 2.10</td><td colspan="4">TWRI/IRNR will coordinate two statewide riparian conferences in coordination with the Texas Riparian Association, professional organizations, River Authorities, or other entities annual meetings.</td></tr>
<tr><td></td><td>Start Date</td><td>Month 13</td><td>Completion Date</td><td>Month 36</td></tr>
<tr><td>Deliverables</td><td colspan="4">• Summaries of Riparian Team meetings and action items
• Standardized presentations of various lengths
• CEU credits for Program
• Periodically updated list of specific watersheds where riparian education trainings have been and will be implemented
• Schedules, agendas, and attendance lists for riparian education trainings, PFC trainings, and statewide conferences
• Collection of press releases, newspaper articles, newsletters, public information statements, etc., as developed and disseminated</td></tr>
</table>

Tasks, Objectives and Schedules						
Task 3	Develop web-based riparian education programs and resources					
Costs	Federal	$28,773	Non-Federal	$93,537	Total	$122,310
Objective	To expand the reach and participation in the Riparian Education Program via web-based resources.					
Subtask 3.1	Using non-federal funds from private foundations, the NRA will provide web-based, digital delivery of comprehensive riparian information through development of the Remarkable Riparian website. NRA will work with TWRI/IRNR and the Riparian Team to produce high quality audio-visual presentations, targeting both rural and urban audiences, for inclusion on the website. This will expand participation in riparian education programs by 1) supporting different adult learning styles and preferences, 2) providing flexible learning opportunities for interested citizens who have time and/or mobility constraints, and 3) enabling ready access to program resources statewide.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 3.2	NRA will track usage of Remarkable Riparian website and report it with each quarterly report.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 3.3	The Nueces River Authority will also participate on Riparian Team assisting with development, marketing, and delivery of riparian landowner programs, annual conferences, and other trainings.					
	Start Date	Month 1	Completion Date	Month 36		
Deliverables	• Web-based delivery mechanism (e.g. voice-over PPTs) • Tracking report of website usage					

Tasks, Objectives and Schedules						
Task 4	Evaluate the effectiveness of the riparian education training resources					
Costs	Federal	$12,000	Non-Federal	$8,000	Total	$20,000
Objective	To measure both knowledge and behavior changes of individuals participating in the program.					
Subtask 4.1	TWRI/IRNR will conduct pre- and post-training evaluations (for group instruction) to assess increased knowledge of participants on the nature and function of riparian zones, their benefits, and BMPs for protecting them and minimize NPS pollution; to evaluate participant satisfaction with the program; and to evaluate participant's intentions to change their behavior as a result of the program. Additionally, TWRI/IRNR will deliver a follow-up assessment via email (post 6-month follow-up for both watershed-based trainings) to ascertain behavior changes actually adopted by participants.					
	Start Date	Month 1	Completion Date	Month 36		
Subtask 4.2	TWRI/IRNR will analyze results obtained from the pre-/post-tests and post 6-month follow-up assessment using descriptive, correlational, and analysis of variances statistical procedures. Results will be used to periodically evaluate and modify riparian education program materials and incorporated into the final report.					
	Start Date	Month 1	Completion Date	Month 36		
Deliverables	• Pre-/post-test evaluations for watershed-based riparian education programs • Six-month follow-up assessments for watershed-based riparian education programs • Results from evaluations					

Project Goals (Expand from Summary Page)

- Facilitate the promotion of healthy watersheds and improve water quality through the delivery of riparian and stream ecosystem education programs with a focus on priority watersheds via group trainings and web-based distance training components.
- To increase citizen awareness, understanding, and knowledge about the nature and function of riparian zones, their benefits, and BMPs to protect them and minimize NPS pollution.
- To enhance interactive learning opportunities for riparian education across the state and establish a larger, more well-informed citizen base working to improve and protect local riparian and stream ecosystems.
- To connect landowners with local technical and financial resources to improve management and promote healthy watershed and riparian areas on their land.

Measures of Success (Expand from Summary Page)

- Deliver a minimum of 25 riparian education programs to 550 participants in prioritized watersheds
- Coordinate 2 Proper Functioning Condition trainings to agency personnel
- Coordinate 2 statewide riparian conferences
- Numbers of citizens using web-based riparian education program presentations
- Increased knowledge and understanding of riparian function and implementation of BMPs by individuals participating in the program, as measured by pre-/post-tests and 6-month follow-up assessment

2005 Texas Nonpoint Source Management Program **Reference (Expand from Summary Page)**

Goals and/or Milestone(s)

Element 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.
4. Increase overall public awareness of NPS issues and prevention activities.

STG Three – 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.

Element 2 – Working partnerships…to appropriate, state,…regional, and local entities, private sector groups, and federal agencies.

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

Part III – Financial Information

Budget Summary			
Federal	$370,941	% of total project	60%
Non-Federal	$247,324	% of total project (≥ 40%)	40%
Total	$618,265	Total	100%

Category	Federal	Non-Federal	Total
Personnel	$186,001	$71,395	$257,396
Fringe Benefits	$48,469	$16,685	$65,154
Travel	$13,367	$0	$13,367
Equipment	$0	$0	$0
Supplies	$7,072	$0	$7,072
Contractual	$28,773	$93,537	$122,310
Construction	$0	$0	$0
Other	$39,368	$7,686	$47,054
Total Direct Costs	$323,050	$189,303	$512,353
Indirect Costs (≤ 15%)	$47,891	$22,901	$70,792
Unrecovered IDC	$0	$35,120	$35,120
Total Project Costs	$370,941	$247,324	$618,265

The TSSWCB CWA §319(h) NPS Grant Program has a 60/40% match requirement. The cooperating entity will be reimbursed 60% from federal funds and must contribute a minimum of 40% of the total costs to conduct the project. The 40% match must be from non-federal sources and should be described in the budget justification. Reimbursable indirect costs are limited to no more than 15% of total federal direct costs. The project budget generally covers a three year period.

Budget Justification (Federal)		
Category	Total Amount	Justification
Personnel	$186,001	• TWRI/IRNR Extension Program Specialist (0.80 FTE) ($134,865) • TWRI/IRNR Communications Team (0.15 FTE) ($14,747) • TWRI/IRNR Program Coordinator (0.05 FTE) ($6,124) • TWRI/IRNR Student Worker (20 hr/wk x 18 mo) ($14,127) • TWRI/IRNR GITR Lab IT Person (0.04 FTE) ($3,333) • TFS Program Coordinator (0.167 FTE) ($12,805)
Fringe Benefits	$48,469	• 17.2% of personnel plus group health of $474/mo. prorated per FTE • 10% fringe rate for students
Travel	$13,367	• TWRI/IRNR Travel - $83/night lodging + $46/day 25 trainings x $175/training (~2 days per diem for 1-2 people); mileage; three professional multi-day trainings for two people, two annual meetings for two people & as needed, travel for site visits prior to training ($9,384) • Instructor Travel – 1-2 instructors per training (est. .5/training) x 25 trainings x $269/training: $77/night lodging + $46/day for ~2 days per diem + $100/training for mileage (200 mi. x $0.50/mi) for travel for training & as needed, travel for site visits prior to training ($3,362) • TFS Travel – 9 trainings, $77/night lodging + $46/day for per diem ($621)
Equipment	$0	N/A
Supplies	$7,072	• TWRI Supplies: screens (2) at $100 each; table top poster at $200; rollup banner at $275; Paper, envelopes, ink cartridges, toner, pens, pencils, name tags, binders, certificates, power cords and other office and meeting/manual supplies for trainings ($5,433) • TWRI 2 outdoor microphones at $500 each ($1,000) • Fuel ($639)
Contractual	$28,773	• Nueces River Authority
Construction	$0	N/A

Other	$39,368	• Printing of manuals and materials for each participant at an estimated $7/participant x ~40 participants/training ($280/training) ($7,000) • Facility Rental (est. $200/training) ($5,000) • Instructor Fees for each meeting: 25 trainings x $500/training/instructor x 1 instructor/training) ($12,500) • Instructor travel for 25 trainings x $360/training: $86/night lodging + $46/day per diem + $182/training for mileage (364 mi. x $0.50/mi) ($9,000) • Special topics instructors: 4 instructors x $500/instructor ($2,000) • Special topics instructors travel: ($548) • Software licenses ($140) • Austin meeting registrations for 2 people ($150) • Laptop, monitor and accessories ($2,250) • iPad and printer ($780)
Indirect	$47,891	• 15% of the following: Total Direct Costs minus Contractual plus $25,000 (only allowed to charge IDC on first $25,000 of contracts)

Budget Justification (Non-Federal)		
Category	Total Amount	Justification
Personnel	$71,395	• TWRI/IRNR Associate Director (0.05 FTE) ($11,451) • TWRI/IRNR Director (0.08035 FTE) ($40,705) • ESSM Asst. Prof. of Ecohydrology (0.0416 FTE in yrs 1 & 2) ($7,239) • TFS Program Coordinator (0.1 FTE) ($12,000)
Fringe Benefits	$16,685	• 17.2% of personnel plus group health of $474/mo. prorated per FTE
Travel	$0	N/A
Equipment	$0	N/A
Supplies	$0	N/A
Contractual	$93,537	• Nueces River Authority
Construction	$0	N/A
Other	$7,686	• TRA volunteer time for 2 conferences ($21.35/hr x 20 hr/year x 6 board members for planning/coordinating/hosting conferences) ($7,686)
Indirect	$22,901	• 26% of the following: Total Direct Non-Federal Costs ($189,303) minus TRA volunteer time ($7,686) minus NRA match ($93,537)
Unrecovered IDC	$35,120	• 11% of the following: Total Direct Federal Costs ($323,050) minus Federal Contractual ($28,773) plus $25,000 (only allowed to charge IDC on first $25,000 of contracts)

Contractual Budget Justification (Federal) – Nueces River Authority		
Category	Total Amount	Justification
Personnel	$8,441	• NRA Director of Resource Protection & Education (0.44 FTE)
Fringe Benefits	$2,363	• 28% of personnel
Travel	$476	• 1-2 trainings/year in Texas Hill Country x $125-165/trip/training for mileage ($476)
Equipment	$0	N/A
Supplies	$0	N/A
Contractual	$0	N/A
Construction	$0	N/A
Other	$13,740	Paper, envelopes, ink cartridges, pens, pencils, and other office supplies ($670/yr), postage ($285/yr), office space rental ($1,855/yr), postage machine rental ($255/yr), copier rental ($380/yr), phone & internet ($1,135/yr) ($4,580/yr)
Indirect	$3,753	• 15% of Total Federal Direct Costs ($25,020)

Contractual Budget Justification (Non-Federal) – Nueces River Authority		
Category	Total Amount	Justification
Personnel	$56,573	• NRA Director of Resource Protection & Education (0.34 FTE) and NRA support staff including part-time employees
Fringe Benefits	$15,840	• 28% of personnel
Travel	$4,000	• $1,500 in Year 1 & 2, $1,000 in Year 3
Equipment	$0	N/A
Supplies	$0	N/A
Contractual	$9,500	• Content creation, web creation, and delivery for Digital Riparian Network. Creation of Remarkable Riparian.org website to include content development, production, post-projection, animation and website management not to exceed $ 9,500.
Construction	$0	N/A
Other	$7,624	Software, hardware, supplies, internet, communications, etc.
Indirect	$0	N/A