Building Partnerships for Cooperative Conservation in the Trinity River Basin

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FINAL REPORT

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TSSWCB PROJECT #10-09

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Acronyms and Abbreviations

BMP	Best management practice
CEA	County Extension Agent
DO	Dissolved oxygen
EPA	U.S. Environmental Protection Agency
GIS	Geographic information system
IRNR	Texas A&M Institute of Renewable Natural Resources
LULC	Land use-land cover
NPS	Nonpoint source
NRCS	Natural Resources Conservation Service, part of USDA
NWTF	National Wild Turkey Federation
QPR	Quarterly progress report
RUAA	Recreational Use Attainability Analysis
Summit	Trinity River Land and Water Summit
TCEQ	Texas Commission on Environmental Quality
TFS	Texas Forest Service
TPWD	Texas Parks and Wildlife Department
TRA	Trinity River Association
TRIMS	Trinity River Information Management System
TSSWCB	Texas State Soil and Water Conservation Board
TWA	Texas Wildlife Association
TWRI	Texas Water Resources Institute
TW	Trinity Waters (formerly Trinity Basin Conservation Foundation)
UAA	Use Attainability Analysis
USDA	U.S. Department of Agriculture
WFSC	Wildlife and Fisheries Sciences unit of Texas A&M AgriLife Extension Service
WPP	Watershed Protection Plan

Tables & Figures

Executive Summary

The Trinity River supports the water demand for ~45% of Texas' population, mainly in the Houston and Dallas/Fort Worth metropolitan areas, and yet most people do not know where their water comes from, nor do they know land management practices that can improve overall water quality. With such a large percentage of the Texas population in one river basin, it is important that basin stakeholders understand basic watershed concepts and have access to resources to guide their management decisions that will benefit water quality.

Through the *Building Partnerships for Cooperative Conservation in the Trinity River Basin* project, funded by U.S. Environmental Protection Agency (EPA) with Clean Water Act (CWA) 319(h) funds through the Texas State Soil and Water Conservation Board (TSSWCB), a Trinity project team was formed consisting of the Texas A&M AgriLife Extension Service, Texas Water Resources Institute (TWRI), Department of Wildlife and Fisheries Sciences (WFSC)—units of AgriLife Extension—and Trinity Waters (TW; formerly known as Trinity Basin Conservation Foundation). The Trinity project team provided educational workshop programs and online resources, increasing awareness of water quality and watershed concepts.

Educational resources and outreach efforts developed through this project greatly amplified the "All Things Trinity, All Things Conservation" initiative of TW, promoting land and water conservation to middle basin stakeholders. Achievements included nine workshops culminating in the Trinity River Land and Water Summit (Summit), three webinars, four AgriLife Extension publications, 31 YouTube videos, an interactive website and four social media outlets that garnered attention and praise from natural resource management entities and individuals around the state. In addition, the Trinity River Information Management System (TRIMS) online mapping website was improved and serves as an excellent land management and conservation planning tool for landowners and watershed managers. A landowner database was created to enhance communication among landowners and other middle Trinity River basin stakeholders.

During this project, 196,297 contacts were made through presentations at workshops and webinars and by operating vendor booths. In addition, 3,754,554 contacts were made through the website and social media channels totaling 3,950,851 contacts during the project.

Based on workshop participant responses, increased awareness of water quality, watershed concepts and different conservation approaches may yield increased implementation of best management practices (BMPs) in the middle basin and has laid the foundation for watershed protection plan (WPP) development in the future. Overall, evaluation results indicate participants at the nine workshops and Summit had a 92% increase in knowledge and nearly all participants reported they would take at least one action to benefit water quality as a result of the program.

At this time, stakeholders are not seeking to begin development of a WPP as a result of this project. The Tarrant Regional Water District (TRWD) has begun development of a WPP in the Richland-Chambers Reservoir watershed. Stakeholders would prefer to allow the Texas Commission on Environmental Quality (TCEQ) or a third party to conduct a Recreational Use Attainability Analysis (RUAA) and/or Use Attainability Analysis (UAA) for Catfish Creek and Upper Keechi Creek. Doing so will establish the appropriate standard for contact recreation and aquatic life uses to address the bacteria and dissolved oxygen (DO) impairments in those creeks.

Introduction

Many Texans within the Trinity River basin do not know the source of their drinking water, the factors that cause impairments to water quality, or the natural processes that can help abate nonpoint source (NPS) pollution. The Trinity River is a resource that is stretched to its usage capacity by two of the largest and fastest growing water consumers in the nation—Houston and Dallas/Fort Worth. The Trinity River and the rural portions of its watershed, the largest part being in the middle basin, are relied upon to provide water resources for the rural and urban populations both within and beyond the basin itself.

A 2006 study by the University of North Texas, titled *Survey of Citizen Knowledge, Understanding and Concerns about Water and Watershed Issues in the Upper Trinity River Basin*, demonstrated this lack of knowledge as 92% of respondents were unaware that they lived in a watershed. Moreover, 45% of the urban respondents did not know the source of their drinking water, yet 66% reported extreme concern for the adequacy of water supplies.

An informed and engaged public is integral to sustaining this water resource, especially given the population projections for this region of the state as projected by the *2012 State Water Plan*. Management of rural lands is critical for sustainable water resources within the basin. Statewide, the population is predicted to increase 82% from 2010-2060 (25.4 million and 46.3 million, respectively) and the demand for water is projected to increase 22%. Due to these projections, there is a great need for informing and educating this population.

The Trinity River basin is home to more than 5.5 million people. The basin begins near the Texas-Oklahoma border in Clay, Archer, and Montague counties. Lost, Hurricane, Grayson, White Rock, Denton, and Clear creeks eventually merge with the West, Elm, and East forks to form the Trinity River near Dallas/Fort Worth. The river then extends southeast about 512 miles, traversing five of the state's 10 eco-regions before emptying into the Gulf of Mexico via Trinity Bay (a sub-bay of Galveston Bay) near Houston. The entire Trinity River basin covers over 18,000 square miles (7% of the total land area of Texas) and encompasses 38 Texas counties. Average annual precipitation within the Trinity River basin ranges from 52 inches near the Gulf of Mexico to less than 36 inches at the headwaters, with extensive water-related human alterations throughout its length.

The Trinity River is directly affected by human activities, especially with the variety of land uses in the watershed. Some of the more prevalent activities within the basin include urbanization, commercial/industrial development, row crop farming, livestock production, outdoor recreation, and timber production. All of these major land uses have direct effects on the water quality and quantity as it moves through the basin; thus, leading to the need for responsible land stewardship and education to safeguard and improve water resources for present and future generations. In addition, 22 major reservoirs have been built within the Trinity River basin providing drinking water, flood control, and recreational opportunities to urban and rural communities.

In 2010, water use projections in the basin are dominated by three categories: municipal 74% (city), industrial 13% (manufacturing, steam electricity, and mining), and agricultural 13% (irrigation and livestock). Municipal use, which is already substantial, is expected to increase to

78%, agricultural use will likely decline to 8% and industrial uses will remain relatively steady at 14% by the year 2060 (2012 State Water Plan, TWDB).

The majority of the middle Trinity River is dominated by rural working lands made up of over 32,000 private farms and ranches that cover 75% of the basin. Natural habitats (wetlands, floodplains, bottomland hardwood forests, and native grasslands) on these private lands serve to maintain water quality, floodplain capacity, wildlife habitats, and provide other environmental services. From 1997 – 2007, land fragmentation pressures from urbanization and decreased economic land use in the Trinity River basin have resulted in a loss of 184,000 acres from farms and ranches greater than 1,000 acres in size (Wilkins et al. 2009). Fragmentation and land use conversions have decreased the basin's natural ecosystems and the services they provide, but through education, planning, and good conservation practices, many of these lands can be restored.

Through the *Building Partnerships for Cooperative Conservation in the Trinity River Basin* project, funded by EPA with CWA §319(h) funds through the TSSWCB, AgriLife Extension, TWRI, WFSC and TW (known as the Trinity project team) responded to the need.

This project continued the work started as part of the Trinity River Basin Environmental Restoration Initiative that began in September 2006. This initiative focused on building the capacity of organizations committed to "improving the quality of life, economic sustainability, and ecological integrity of areas associated with the Trinity River basin through a coalition of local communities, non-governmental organizations and stewards of private and public lands."

TWRI, in coordination with TW, the Texas A&M Institute for Renewable Natural Resources (IRNR) and WFSC, led and coordinated this project. IRNR, with input from project partners, developed and maintained a stakeholder database, which was used to effectively communicate and maintain contact with targeted stakeholders and landowners. In addition, fact sheets, newsletters and other water quality and educational materials were developed by the team and delivered to stakeholders during this project.

The Trinity project team provided a variety of workshops, educational programs and technical resources to landowners about the importance of effective natural resource management and BMPs used in agricultural production and wildlife conservation. Water quality education and cooperative conservation programs were delivered to stakeholders in the basin leading to an increase in knowledge and awareness of land stewardship and effects on water quality. Program topics included water quality, proper grazing management, wildlife management, wetland development and other watershed management topics, bringing together middle-basin stakeholders and promoting the land and water conservation message developed for this project, titled: "All Things Trinity, All Things Conservation." A series of nine educational workshops were held culminating in a capstone Summit. According to responses from workshop attendees, the increase in awareness of water quality issues and different conservation approaches yielded increased implementation of BMPs in the watershed.

In an effort to effectively deliver relevant programs to each smaller watershed within the Trinity River basin, IRNR developed a land use-land cover (LULC) map derived from the most recent

existing datasets of the Trinity River basin. The LULC maps were tailored for each watershed where the educational workshops were held and were displayed for participants to view. Specifically, maps of the Richland-Chambers Reservoir, Catfish Creek and Lake Livingston watersheds were developed showing LULC, aerial imagery, and past stream and reservoir impairments. In addition, aerial and land use maps were developed for Tehuacana Creek, Upper Keechi Creek, and Bedias Creek watersheds.

The watershed boundaries developed through these maps have also been incorporated into the Trinity River Information Management System (TRIMS). TRIMS is open to any user who wants information on the Trinity River. It is an online mapping website with a suite of features that was improved upon through this project and serves as an excellent land management and conservation planning tool for landowners and water managers. The IRNR geographic information system (GIS) team attended several workshops to present TRIMS and demonstrate the utility in order to gain stakeholder feedback. TRIMS improvements were implemented based on this feedback. Support and updates to associated map data continued as information became available.

To determine effectiveness and increases in stakeholder knowledge, pre/post evaluations were used at all education workshops including the capstone Summit. A web-based clearinghouse was developed (http://trinitywaters.org/) profiling the geological, ecological, and sociological data of the Trinity River basin to complement existing tools such as TRIMS (http://trims.tamu.edu), Texas Land Trends (http://txlandtrends.org), etc., promoting land and water conservation stewardship management practices and case models for private landowners in the Trinity River basin. The website contains all information related to the Trinity River basin and conservation with emphasis on TW's "All Things Trinity, All Things Conservation" to assist stakeholders in their efforts to engage in effective, innovative, and cooperative conservation practices.

To further increase stakeholder engagement and relay information, as well as increase program capacity and buy-in, social media outlets were used to create an outreach campaign using common social media platforms. Social media used included Facebook, Twitter, ScoopIt, Blogger, Tumblr, Flickr, and YouTube. Likes, tweets and views have shown a steady growth in those responding to the messages sent out through these media.

Program Development

The Trinity project's goal was to develop a peer network of private landowners engaged in cooperative conservation to advance the restoration and protection of water quality within the Trinity River basin by:

(1) Establishing relationships with stakeholders in the middle Trinity River basin to create partnerships necessary for future WPP development and implementation
(2) Promoting a healthy Trinity River basin by increasing stakeholder awareness, understanding, and knowledge about the nature and function of watersheds, potential impairments, and watershed protection strategies to minimize NPS pollution
(3) Developing a citizen engagement and leadership capacity in resources management
(4) Fostering a culture of cooperative natural resources stewardship with stakeholders throughout the middle basin

To carry out these goals, a full-time person was needed to conduct all the activities. An Extension Assistant was hired through WFSC to compile existing information, develop education curriculum as needed and help in coordination of the education programs. The WFSC Extension Assistant functionally served as an education and outreach coordinator for TW.

Communication

Because establishing communication with primary stakeholders in the Trinity River basin was a key goal, the project team and partners designed a stakeholder database derived from a data spreadsheet of primary stakeholders. It contains 336 landowner contacts who live within the Trinity River basin. The database was used to effectively communicate and maintain contact with targeted stakeholders.

Using the database, Constant Contact e-newsletter service was used to disseminate *The Basin Bulletin* electronic newsletter, workshop notices and project-related stories, as well as publications and other promotional materials developed during the project to stakeholders. The database was updated as needed throughout the project to make access easier. It was also used to send hard copy mailouts advertising the Summit and Trinity Waters one-pager.

In addition to emails and mailouts, TW and WFSC engaged in direct peer-to-peer outreach with critical stakeholder groups and entities from across the Trinity River basin. Communications were established with numerous agencies and entities, including, but not limited to:

- County AgriLife Extension agents
- Galveston Bay and Estuary Program
- Local forestry associations
- Local groundwater conservation districts
- Local soil and water conservation districts
- Regional councils of government
- Southwestern Cattle Raisers Association
- Tarrant Regional Water District
- Texas A&M AgriLife Research and Extension Centers at Dallas and Overton
- Texas Cattle Raisers Association
- Texas Commission on Environmental Quality (TCEQ)
- Texas Farm Bureau
- Texas Forest Service (TFS)
- Texas Forestry Association
- Texas Parks and Wildlife Department (TPWD)

- Texas Wildlife Association (TWA)
- Trinity River Authority (TRA)
- USDA Natural Resources Conservation Service (NRCS)

WFSC continued to provide these groups with information on new publications, workshop locations and dates, the Summit, important news releases, etc. County Extension Agents (CEAs) were also closely involved with workshop planning and outreach.

TW, WFSC, TWRI, and IRNR also attended and participated in 23 public meetings, and conferences to communicate project goals, activities and accomplishments. Such meetings included, but were not limited to: Watershed Coordinator Roundtables; TRA Clean Rivers Program; vendor booths; steering committee meetings; Texas in-stream flow programs; Texas Grazingland Conference; and the Texas Section Society for Range Management Conference.

Educational Materials

WFSC through AgriLife Extension developed four publications directed toward awareness and implementation of habitat restoration techniques that also improve water quality. These publications were incorporated into the workshop curriculum and provided the basis for the prairie restoration and TRIMS presentations.

The *Native Grassland Restoration in the Middle Trinity River Basin* (SP-469) publication was released August 9, 2012 and is available for order from the Texas A&M AgriLife Bookstore. The publication provides step-by-step instructions for landowners to restore native grasses and forbs on their land for wildlife habitat and watershed protection.

The *Native Grassland Monitoring and Management* (WF-001) publication was released in March 2013 and describes monitoring activities that landowners can conduct to evaluate habitat conditions over time, as well as a description of different management activities that can be implemented. This publication received the 'Outstanding Technical Publication' award from the Texas Chapter of the Wildlife Society meeting from February 20–22, 2014 in Austin, TX.

The *Riparian Restoration on Farms and Ranches in Texas* (WF-010) was released in August 2014 to increase awareness of the importance of proper riparian area management in central and eastern Texas, with particular attention to the Blackland Prairie and Post Oak Savannah ecoregions. Recommendations given in the publication include restoration techniques, plant species selection, monitoring methods, and grazing and cropland management. This publication was developed in coordination with TWRI and NRCS.

The *Watershed Monitoring Benefits Private Lands and Public Water Supplies* (EWF-012) electronic publication available through the AgriLife Bookstore, describes different study designs and equipment used to collect data when monitoring watersheds to evaluate BMP effectiveness and water quality improvement over time. Using an example from a current study in the middle Trinity River basin, the authors demonstrate the value of these studies for understanding the best land management practices that can be implemented to improve agricultural productivity and water quality improvement. Knowledge gained from these studies benefit landowners, water suppliers and state agencies overseeing water quality in Texas.

These publications were distributed and promoted during the project's educational workshops and webinars. They were also promoted through news releases and the different social media channels. These publications are available at the AgriLife Bookstore and Scribd. The total number of downloads and/or hard copy orders is 4,261, which are detailed in Table 1.

Table 1. Downloads and/or hard copy orders from the AgriLife Bookstore and Scribd.

Publication	AgriLife Bookstore	Scribd
Native Grassland Restoration	436	1,935
Native Grassland Monitoring	289	1,381
Riparian Restoration	83	137
Total	**808**	**3,453**

Educational Programs

TW, WFSC, TWRI and IRNR conducted a series of nine educational workshops bringing middle basin stakeholders in each workshop location together to discuss and promote "All Things Trinity, All Things Conservation." The workshops concluded with a capstone Summit in Athens.

The locations identified for the workshop series were Richland-Chambers watershed near Corsicana, Catfish Creek near Athens, and Lake Livingston near Huntsville as these watersheds are currently listed as impaired on the state's *303(d) List* or are a major water supply source. Three rounds of workshops were held in each of those three locations.

Interactive Website

TW, WFSC and IRNR created, hosts and maintains a website containing all related Trinity River basin and conservation information with the emphasis of TW's "All Things Trinity, All Things Conservation" to assist stakeholders in their efforts to engage in effective, innovative, and cooperative conservation practices.

A new "next generation" website was designed by a subcontractor through TW, developed by IRNR and hosted by TW. The TW website went live in July 2011. TW, through collaboration with IRNR and WFSC, developed the web-based information clearinghouse, profiling geographical, ecological, and sociological data of the Trinity River basin to complement existing tools (TRIMS, Texas Land Trends, etc.) promoting land and water conservation stewardship management practices and case models for private landowners in the Trinity River basin.

GIS Inventory & TRIMS

IRNR, with assistance from TW and WFSC, developed a comprehensive GIS inventory for the middle Trinity River basin. Data includes the most recent information available on land use, elevation, soils, stream networks, reservoirs, roads, public parklands, wildlife management areas municipalities, and satellite imagery or aerial photography. Locations of water quality monitoring stations, USGS gages, wetlands, and TPDES permittees (including WWTFs, CAFOs and MS4s) were also included. IRNR sought input from local stakeholders, public officials, agency personnel and others to verify the accuracy of the GIS inventory information.

Initially, a preliminary assessment of data already housed within TRIMS was conducted. Data gaps were identified and timeliness of that existing data was assessed. A new version of TRIMS was released in December 2011, and the data continued to be updated and added as needed.

Implementation

TW, WFSC, TWRI and IRNR developed and disseminated project informational materials, including flyers, news releases, workshop announcements, and other appropriate promotional publications. Local media were also used to promote project educational events.

During this project, eight *Basin Bulletin* electronic newsletters were produced highlighting activities of Trinity Waters and project partners such as events, webinars, publications, TRIMS updates, project activities and important news stories. The newsletter was distributed to more than 700 individual landowners and entities in the watershed through Constant Contact.

One pager and presentations

To foster cooperative conservation across the middle Trinity River basin, TW and WFSC developed a one-pager and standard presentation on "All Things Trinity, All Things Conservation" that was distributed and/or delivered in conjunction with existing educational programs. The WFSC Extension Associate developed five additional presentations related to land management activities that were used at the workshops:

- Land Use Trends in the Trinity River basin
- Treasuring the Trinity: Challenges and Opportunities
- Prairie Restoration
- Trinity River Information Management System Features
- Trinity River Land and Water Summit: Overview of Watersheds, Water Quality Impairments and Planning Efforts

These presentations have also been uploaded to the website Slideshare and can be viewed at http://www.slideshare.net/trinitywaters. Posting these to an online site such as Slideshare allows easy sharing through social media channels and embedding onto websites. To date, all versions of these presentations have been viewed 1,507 times.

The "All Things Trinity, All Things Conservation" was presented at more than 15 meetings and conferences plus the project workshops with a total of 818 contacts.

TW, IRNR, and WFSC distributed educational materials and publications to landowners in the basin through exhibits, workshops, conferences, county programs, and other educational programs.

Educational workshops

Since the Trinity River basin is so large, the educational workshops were divided into three locations within the basin. A series of workshops were held at each location focusing on different themes related to the watershed, water quality, tools, conservation programs and watershed management. Workshops allowed the opportunity to reach people who would not travel to a single location.

Round one focused on watershed and water quality basics and included AgriLife Extension Texas Watershed Steward Program personnel. Dates for these workshops were September 7, 2012, in Corsicana; October 29, 2012, in Athens; and November 1, 2012 in Huntsville. There were a total of 41 attendees across the three workshops. Agendas and evaluations can be found in

Appendix A.

Round two focused on tools, such as the TRIMS online mapping tool, and conservation programs, such as Water Quality Management Plans with TSSWCB that can aid landowners in effectively managing their land which in turn benefits water quality in creeks and rivers. Dates for these workshops were December 12, 2012, in Corsicana; February 5, 2013, in Athens; and February 8, 2013, in Huntsville. There were a total of 54 attendees across the three workshops. Agendas and evaluations can be found in Appendix C.

Round three focused on livestock and feral hog management to reduce bacteria pollution in creeks and rivers. Dates for these workshops were February 27, 2013, in Corsicana; April 3, 2013, in Athens; and March 27, 2013, in Huntsville. There were a total of 30 attendees across the three workshops. Agendas and evaluations can be found in Appendix E.

A total of 125 attendees participated in the nine workshops. The presentations from the first round of workshops were recorded and uploaded to the WFSC Extension YouTube channel at https://www.youtube.com/wfscagrilife. These three videos, "Overview of watershed functions and features," "Trinity River restoration project overview," and "Water quality basics and protection strategies in Texas" have been viewed 569 times.

The Trinity River Land and Water Summit concluded the series of workshops in the middle Trinity River basin by discussing future water quality and watershed planning. Key stakeholder groups and entities were notified about the event.

The Summit was held on October 2, 2013, in Athens with 70 participants. Keynote speakers were Todd Staples, Texas Agriculture Commissioner, and Bob McCan, President of the National Cattlemen's Beef Association. Other presenters included Tarrant Regional Water District, Texas A&M AgriLife Research, the Meadows Center for Water and the Environment and private landowners. The full schedule of presenters and topics can be seen in Appendix G. Summit vendors and sponsors included AgriLand Farm Credit and Heritage Land Bank (provided breakfast and lunch), TPWD, TWA, Texas Department of Agriculture/Texas Water Smart, Texas Water Development Board, National Wild Turkey Federation, and Connemara Conservancy.

TW and WFSC working with IRNR used the GIS inventory to develop watershed and subwatershed maps to best match educational delivery with specific groups of stakeholders. IRNR developed maps of the Richland-Chambers Reservoir watershed, Catfish Creek watershed and Lake Livingston watershed showing LULC, aerial imagery, and past stream and reservoir impairments. Examples of these maps are found in Figure 1. These were displayed at the September 7, 2012, December 12, 2012, and February 27, 2013, workshops in Corsicana; October 29, 2012, February 5 and March 27, 2013 workshops in Athens; and November 1, 2012, and February 8, 2013, workshop in Huntsville. IRNR also developed aerial and land use maps for Tehuacana Creek, Upper Keechi Creek, Bedias Creek watersheds that were used for discussions at the Summit.

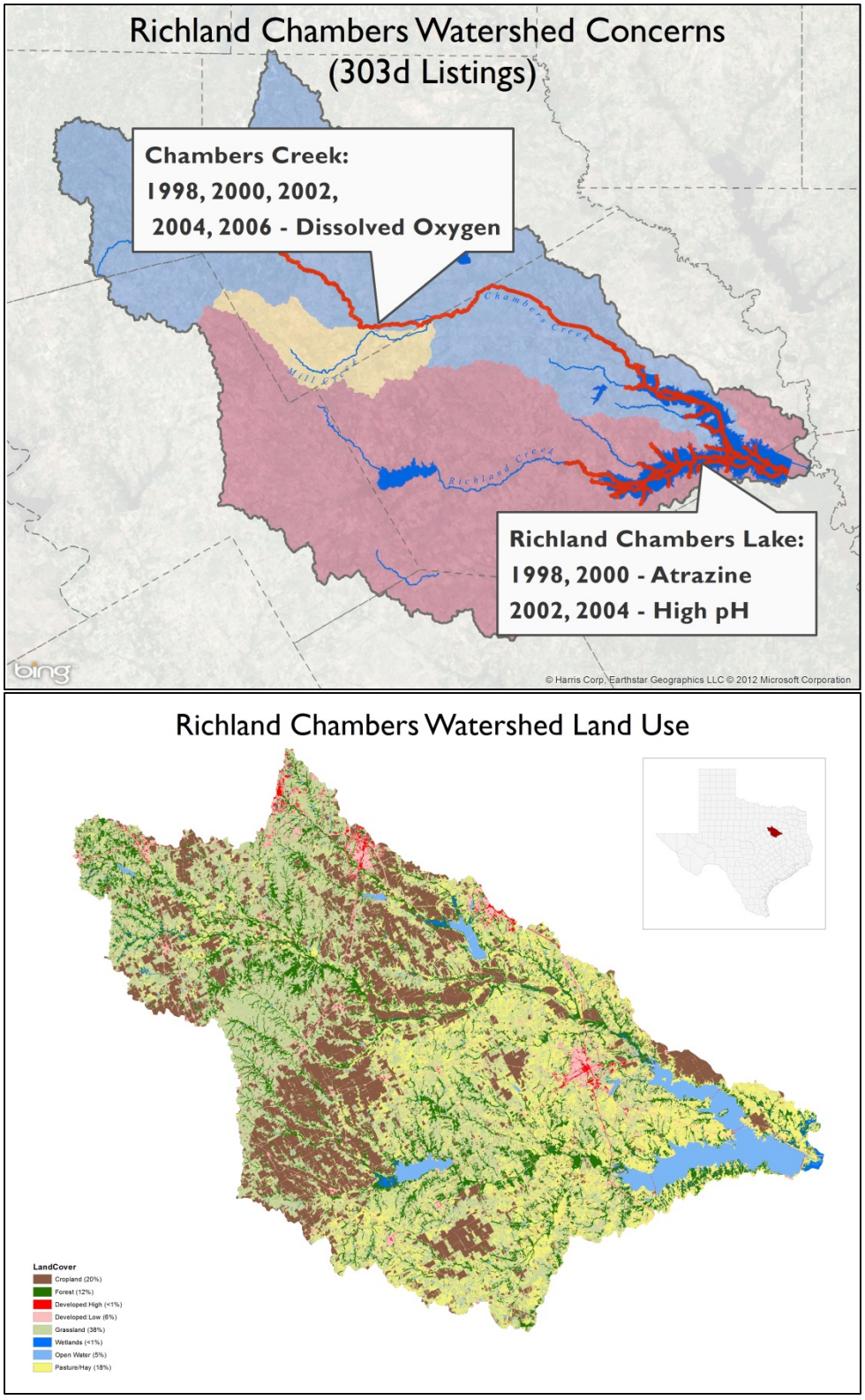

Figure 1. Examples of IRNR maps developed and displayed at the workshops: Richland Chambers Watershed Concerns listed on the *303(d) List*; Richland Chambers Watershed Land Use.

The IRNR GIS team attended the Corsicana workshop on December 12, 2012, Athens workshop on February 5, 2013, and Huntsville workshop on February 8, 2013, to present and demonstrate the utility of the TRIMS website. Based on stakeholder feedback from the workshops, the following improvements to TRIMS were implemented:

- Ensure all metadata contains the data source URL, enabling the user to directly access spatial data for use outside of TRIMS
- Provide a link to a TRIMS help document
- Explore the capability to import/export spatial data to/from TRIMS
- Explore capability to query by area (e.g. water quality monitoring stations in a county)
- Update land cover
- Add data sources to the information on each layer so any user can download the GIS data for their own computer with links to the data source
- Add data layers focusing on impaired water segments/bodies
- Update TRIMS to include all counties south of Dallas to coast and updated LULC layers
- Update TRIMS to include watershed boundaries for: Richland-Chambers Reservoir, Catfish Creek, Tehuacana Creek, Bedias Creek, Upper Keechi Creek, Lake Livingston

In addition to the workshops and Summit, TW hosted three other educational events with collaborators. These events included:

- **Women of the Land –** April 19–21, 2013 – Cedar Mountain Lodge in Scurry, TX
    - Attendees: 14 participants (this event was purposefully kept small)
    - Partners: TW, TWA, TPWD, AgriLife Extension, NRCS, San Antonio Stock Show and Rodeo
- **L.A.N.D.S. Teacher / Volunteer Training** – June 12–14, 2012 – Cedar Mountain Lodge, Scurry, TX
    - Attendees: 32 teachers plus 8 instructors
    - Partners: TW, TWA, Conservation Legacy, NRCS, AgriLife Extension, TPWD, John Bunker Sands, Dixon Water Foundation, Kaufman County Urban Forrester
- **Trinity LANDS –** multiple locations/schools involved
    - Attendees: 718 youth x 2 events at each school each year = 1,436 youth contacts
    - 2011–2012 at Blooming Grove (60/event), and St. Phillips (40/event)
    - 2012–2013 at Blooming Grove (60/event), St. Phillips (40/event), All Saints (60/event), Porter Elementary (89/event), and East Ft. Worth Montessori (45/event)
    - 2013–2014 at All Saints (60/event), Porter Elementary (89/event), St. Phillips (40/event), Blooming Grove (60/event), and Collins Elementary (75/event)

"All Things Trinity, All Things Conservation" was also presented at the following programs totaling 818 contacts:

- BMP Management Group meeting – April 4–5, 2011
- Galveston Bay Estuary Program meeting – October 26, 2011 (40 attendees)
- Water As A Crop™ program workshop, Navarro County, September 8, 2011 (11 attendees)
- Terrell and Huntsville on February 28 and 29, respectively. These workshops were held to train landowners on using TRIMS mapping tool. Blake presented "All Things Trinity,

All Things Conservation." There were 8 attendees in Terrell and 7 in Huntsville.

- Pond management workshop, Corsicana, March 28, 2012, presented "All Things Trinity, All Things Conservation" (54 attendees)
- Trinity County Forest Landowners Association meeting, Lake Livingston, April 21, 2012 (20 attendees)
- TRA Clean Rivers Program meeting in Dallas on April 30, 2012 (50 attendees)
- Feral Hog control workshop, Kemp, May 4, 2012 (46 total attendees)
- TWA Women of the Land program, Scurry, April 20, 2012, delivered two presentations (Trinity River Basin Land Trends and Prairie Restoration) (15 attendees)
- Cow-Calf Clinic in Athens, March 28, 2013 (195 attendees)
- Well Owner meeting, Cleveland, April 25, 2013, (30 attendees)
- Cow Country Congress, Crockett, October 24, 2013 (177 attendees)
- Texas Riparian Association/Society for Ecological Restoration Conference in Junction, November 2, 2013 (25 attendees)
- Corsicana Rotary Club, November 20, 2013 (70 attendees)
- Houston Wilderness' Sam Houston Greenbelt Network meeting on November 21, 2013, presented on Cooperative Conservation project goals (20 attendees)
- State Forest Stewardship Coordinating Committee meeting, co-hosted by TWRI and IRNR, on November 21, 2013, presented on "Conclusions of the Trinity River Land and Water Summit" summarizing the findings and successes of the project to-date for Cooperative Conservation project (50 attendees)

Webinars

In addition to the workshops and Summit, WFSC hosted three webinars from July to September 2013 on the Forestry Webinar Portal with 288 total attendees. These hour-long webinars highlighted land stewardship activities such as cattle, quail, and feral hog management that benefit water quality, as well as directing stakeholders to resources available to help their watershed management efforts. Webinar titles, descriptions, and participant data is described below. Also, a Green Savings Analysis feature that calculates salary, fuel, and carbon emissions savings from participants and presenters not travelling, but rather watching from their office or computer was used; further details on how this is calculated can be found at the Forestry Webinar Portal website. Estimated savings for each webinar are shown below in Table 2.

1. **Treasuring the Trinity: Challenges and Opportunities**
   Presenter: Blake Alldredge, Extension Associate, Texas A&M AgriLife Extension Service, July 11, 2013, 12-1 pm
   Description: The Trinity River in Texas provides water for over 40% of Texans, including the Dallas/Fort Worth and Houston metro areas. The history of the Trinity River is one of severe pollution which caused the river to be labeled "septic" back in the 1960's. Though many advances in wastewater technology and pollution control have significantly improved water quality in the river, problems still exist. To address these issues, Trinity Waters, a landowner organization, is partnering with several agencies and corporations to promote the benefits of rural land stewardship for improving the quality and quantity of water that ultimately ends up in urban faucets. An overview of watershed protection strategies will be discussed to inform participants of how these strategies can guide these efforts.

Views & Savings: This webinar had 38 participants view the live webinar, and another 26 viewed the recorded version, totaling 64 participants. Estimated savings are:
Total Cost Savings – $14,571
Salary Savings – $10,590
Carbon Dioxide Emissions Savings – 20,326 lbs
Fuel Savings – $3,925

2. **Turning Your Land Into a Sponge**
Presenter: Dr. Larry Redmon, State Forage Specialist, Texas A&M AgriLife Extension Service, August 8, 2013, 12-1 pm
Description: Cattle production is the largest agricultural activity in Texas and in the Trinity River basin. Drought is a major challenge that faces ranchers and one that is too often unprepared for. Managing the vegetation on the land and setting an appropriate cattle stocking rate are the best ways to protect the productivity and sustainability of your ranch. Leaving sufficient amounts of standing vegetation and litter on the land increases rainfall infiltration, which reduces runoff and erosion, allowing the land to store water that can be used later in the growing season or the next year.
Views & Savings: This webinar had 72 participants view the live webinar, and another 32 viewed the recorded version, totaling 104 participants. Estimated green savings are:
Total Cost Savings – $26,830
Salary Savings – $19,500
Carbon Dioxide Emissions Savings – 37,427 lbs
Fuel Savings – $7,228

3. **Meeting the Water Needs for Texans and Wildlife**
Presenter: Dr. Jim Cathey, Extension Wildlife Specialist, Texas A&M AgriLife Extension Service, September 12, 2013, 12-1 pm
Description: Wildlife management is becoming more popular as the main land management activity or incorporated into traditional agricultural operations. Managing for wildlife has multiple benefits, including more economic opportunities for landowners, greater land productivity and sustainability, and clean water. Managing for quail requires maintaining sufficient vegetative cover on the land to provide food and shelter, which also catches more rainfall and allows water to infiltrate into the ground and allow the land to act like a 'sponge.' Two North Texas water districts have constructed large wetlands to efficiently purify and extend the water supply for North Texas, while at the same time creating significant wildlife habitat. These examples, along with current projects by Trinity Waters and other partners, enhances the ability for the rural lands of the Trinity River basin to meet the water needs for 45% of Texans.
Views & Savings: This webinar had 90 participants view the live webinar, and another 30 viewed the recorded version, totaling 120 participants. Estimated green savings are:
Total Cost Savings – $29,426
Salary Savings – $21,386
Carbon Dioxide Emissions Savings – 41,047 lbs
Fuel Savings – $7,928

Table 2. Cumulative total savings from participants attending webinars as opposed to traveling to a meeting.

Webinar	Total Cost Savings	Salary Savings	Carbon Dioxide Emissions Savings	Fuel Savings
Treasuring the Trinity: Challenges and Opportunities	$14,571	$10,590	20,326 lbs	$3,925
Turning Your Land into a Sponge	$26,830	$19,500	37,427 lbs	$7,228
Meeting the Water Needs for Texans and Wildlife	$29,426	$21,386	41,047 lbs	$7,928
TOTALS	**$70,827**	**$51,476**	**98,800 lbs**	**$19,081**

News Articles

Advertising for workshops, meetings, webinars, the Summit, and publications were sent through various media. Sixteen notices were sent through Constant Contact and CEA lists; see Table 3. TWRI wrote and published 12 articles through their e-newsletter, *Conservation Matters* (formerly *New Waves*) as shown in Table 4, and facilitated getting 22 news releases sent out through Texas A&M AgriLife Communications as shown in Table 5.

Table 3. Notices and news releases distributed via Constant Contact or CEA List.

No.	Event	Date Sent	Media
1	Workshop Notice	2/7/2012	Constant Contact
2	Workshop Notice	3/8/2012	Constant Contact
3	Workshop Notice	5/14/2012	Constant Contact
4	Round 1 Workshops Notice	8/21/2012	Constant Contact
5	Round 2 Workshop Notice	11/30/2012	Constant Contact
6	Round 3 Workshop Notice	2/20/2013	Constant Contact
7	Workshop Notices: middle Trinity River Instream Flow meetings and final two workshops of Round 3	3/20/2013	Constant Contact
8	Workshop Notice: Riparian Grazing	5/7/2013	Constant Contact
9	News release: Round 2 of workshops	11/30/2012	CEA list (700)
10	News release: Round 3 of workshops	2/19/2013	CEA list (700)
11	Webinar Notice: Turning Your Land Into a Sponge	8/5/2013	Constant Contact
12	Summit Notice and Webinar Notice: Meeting the Water Needs of Texans and Wildlife	9/5/2013	Constant Contact
13	Final Summit Notice	9/25/2013	Constant Contact

Table 4. News releases published through TWRI's *Conservation Matters* e-newsletter.

No.	Title	Issue
1	Alldredge appointed education, outreach coordinator for mid-Trinity River project	June 2011
2	Trinity Waters kicks off website, social media, conservation projects	July 2011
3	Trinity Waters hosting free land stewardship workshops Nov. 21-22	Oct. 2011
4	Improved free online mapping tool will help Trinity River basin stakeholders	Jan. 2012
5	Private-public partnerships foster land and water conservation in Trinity River basin	May 2012
6	Water quality, land-management workshops for Trinity River basin begin Sept. 7	Aug. 2012
7	New Extension resource helps Trinity River basin residents restore grassland	Aug. 2012
8	Trinity Waters hosting another round of land and water workshops	Jan. 2013
9	Third round of Trinity Waters workshops to address cattle production, feral hogs	Feb. 2013
10	AgriLife Extension publishes new native grassland management resource	April 2013
11	Trinity River basin webinars focus on land and water management	July 2013
12	Free recap of Trinity Summit available	Oct. 2013

Table 5. *AgriLife Today* news releases sent out about project activities and events.

No.	Title	Year
1	AgriLife Extension associate appointed education, outreach coordinator for mid-Trinity River project	2011
2	Trinity Waters organization launches website	2011
3	AgriLife Extension land steward programs to focus on Trinity River basin	2011
4	Water As A Crop™ project finding fertile ground in Trinity River basin	2011
5	Landowners, conservation advocates participate in Trinity River basin workshop	2011
6	Free online mapping tool for Trinity River basin stakeholders updated	2011
7	Free workshops offered to Trinity River basin landowners	2012
8	Kaufman County workshop will address feral hog behavior, capture	2012
9	New AgriLife Extension publication gives guidance on grassland restoration	2012
10	Water quality, land management workshops for Trinity River basin begin Sept. 7	2012
11	New round of Trinity River basin water, land management workshops slated	2012
12	Trinity Waters, AgriLife Extension offer additional water, land management workshops	2013
13	Third round of educational workshops slated for Trinity River basin	2013
14	New AgriLife Extension native grassland monitoring/management publication announced	2013
15	Riparian area grazing workshop set May 10 in Ennis	2013
16	Trinity River basin webinars focus on land and water management	2013
17	Turning your land into a sponge is focus of upcoming webinar	2013
18	Trinity River land and water summit set Oct. 2 in Athens	2013
19	Meeting the water needs of Texans and wildlife is Sept. 12 webinar topic	2013
20	Trinity River basin webinars focus on land and water management	2013
21	Trinity River Land and Water Summit summary now online	2013
22	AgriLife Extension announces new riparian restoration publication	2014

The TWRI project manager and WFSC AgriLife Extension associate also wrote an article about the Trinity project and Trinity Waters, *Behind the scenes of Trinity Waters*, that was published in the Fall 2012 edition of TWRI's *txH2O* magazine. Another article, *Rural-Urban Connections Lead to Conservation in the Trinity River basin*, was sent to and published by the Texas Wildlife Association in August 2013. A popular article, *Managing Cattle during Drought*, was published in the *Texas Landowner Association* magazine in March 2014.

Through the news releases and notices mentioned above, additional popular media outlets and server lists re-published and/or publicized this information, in addition to it being included on the TW and TWRI Facebook pages and Twitter. News releases and notices were also cross publicized by TSSWCB. Table 6 lists the external media that re-published these news releases.

Figure 2. Sound management of land creates opportunities for mixing livestock, farming and water conservation. Here healthy rangelands slow and hold rainwater to maintain streams and their ecosystems.

Table 6. External news releases on the Trinity project.

No	Media	Title	Date
1	TSSWCB Conservation News	Trinity River Conservation Effort Benefits from Partnerships	7/11/2008
2	The Cattleman	Landowners key to Trinity River Basin water and wildlife stewardship efforts	4/15/2011
3	Land & Livestock Post – The Eagle	AgriLife joins efforts to restore habitat, water quality on middle Trinity River	5/2/2011
4	TSSWCB Conservation News	AgriLife Extension associate appointed education, outreach coordinator for Mid-Trinity River project	6/17/2011
5	The Outdoor Wire	Water As A Crop project finding fertile ground in Trinity River Basin	7/14/2011
6	TSSWCB Conservation News	Trinity Waters organization launches website	7/19/2011
7	The Farmer-Stockman	Other Newsmakers	9/2011
8	Country World	AgriLife Extension land stewardship programs to focus on Trinity River Basin, Free Workshops to be held Kaufman, Huntsville	9/29/2011
9	TSSWCB Conservation News	AgriLife Extension Land Steward Programs to Focus on Trinity River Basin	10/6/2011
10	TSSWCB Conservation News	AgriLife Extension land steward programs to focus on Trinity River Basin	10/14/2011
11	TSSWCB Conservation News	Free online mapping tool for Trinity River basin stakeholders updated	12/28/2011
12	texashuntingforum.com	Free workshops offered to Trinity River basin landowners	2/8/2012
13	TSSWCB Conservation News	Free workshops offered to Trinity River basin landowners	2/16/2012
14	Southwest Farm Press	New AgriLife Extension publication gives guidance on grassland restoration	8/14/2012
15	waterasacrop.org	Water as a Crop featured in 'txH2O'	11/13/2012
16	Liberty Vindicator	Workshops to be held in Corsicana, Athens and Huntsville	12/1/2012
17	Corsicana Daily Sun	AgriLife water, land workshops slated	12/3/2012
18	North Texas eNews	Trinity River workshops focus on water and land management	1/25/2013
19	Country World	AgriLife Extension offers guidance on grassland restoration	2/14/2013
20	North Texas eNews	Trinity River basin webinars focus on land and water management	7/5/2013
21	Freestone County Times	AgriLife Extension Service presents Trinity River Land & Water Summit	9/7/2013
22	WacoTrib.com	Farm briefs: Sept. 29, 2013	9/29/2013
23	Texas Tribune	Reused Wastewater Key to Trinity River's Survival	10/16/2013
24	TSSWCB Press Release	Trinity River Land Water Summit a Success	10/20/2013

Technology Transfer

TW Website

WFSC and IRNR compiled educational/training materials and listed them as resources in the Landowner Library on the TW website. The direct link to these materials is: http://trinitywaters.org/landowner-library/. Listed materials include more than 400 publication links related to:

- Water (rainwater harvesting, watershed management, urban water conservation, etc.)
- Land Management (livestock production, wildlife habitat, plant identification, etc.)
- Economics (financial assistance programs, landowner economics)
- Education (youth and outdoor recreation)

The TWs' website was continually updated throughout the project with project materials as needed and acts as a clearinghouse for the project and project information as well as serving as the organization's website. WFSC utilized Texas Land Trends data to produce a blog article about *Trinity River Basin Land Use and Ownership Size Trends* that was reformatted and also made into a webpage on the TW website. A link was also added to TRIMS under the newsletter subscription box. The website is linked on about 20 other websites, including TPWD.

From the release of the website on July 18, 2011 to August 15, 2014, there were 41,213 page views by 15,748 unique visitors. These visitors originate from 114 countries, all 50 states in the U.S. and 405 Texas cities.

Social Media

Deployment of the Social Media Engagement model was used to increase the effectiveness of communication, information transfer, community engagement, and social facilitation for problem solving in the middle Trinity River basin. IRNR evaluated which model tools should be aligned with the outreach and used social media channels (Facebook, Twitter and others) to develop a virtual community of interest within the Trinity River basin. The goal of the model deployment was to increase the reach and capacity of program efforts in the basin and to strengthen ties among stakeholders to the common objectives of the project. Google analytic trends were monitored to gauge which social media tools bring the best impact to the project.

Facebook and Twitter accounts were developed first and were continually updated throughout the project with recent information and links to resources and news stories. WFSC actively directed people to the website, via Facebook and Twitter, and actively re-posted agriculture, wildlife, and other pertinent articles for promotion on Facebook.

Trinity Waters Facebook, Twitter and Scoop.it accounts are active and continue to gain numbers of contacts. As of August 15, 2014, numbers for each of the social media outlets were:

- Wild Wonderings Blog – 33 articles, 16,626 views
- Trinity Waters Facebook – 789 Likes, 1,940 posts, 129,371 people reached
- Trinity Waters Twitter – 991 Followers, 7,144 tweets
- Trinity Waters Scoop.it! – 1,400 views on 780 posts
- Trinity Waters Tumblr – 108 page views by 37 unique visitors

Facebook

The TW Facebook page was created in June 2011. The Facebook page slowly and steadily received LIKES, but was not increasing rapidly. In 2012, Facebook changed the way users see posts in news feeds to only show friends or pages they are actively engaged with by frequent posts, LIKES, or comments. Also, posts by pages are limited by Facebook in an effort to have page managers pay Facebook to promote posts and increase LIKES. Therefore, TW posts were not appearing in many people's News Feeds.

In an effort to increase page LIKES for the TW Facebook page, WFSC spent $200 to promote the page. This strategy was successful as page LIKES increased from 324 on February 3, 2014, to 769 as of March 31, 2014 as shown in Figure 2. Through the page promotion, TW Facebook gained 400 new LIKES with an average cost per LIKE of $0.54.

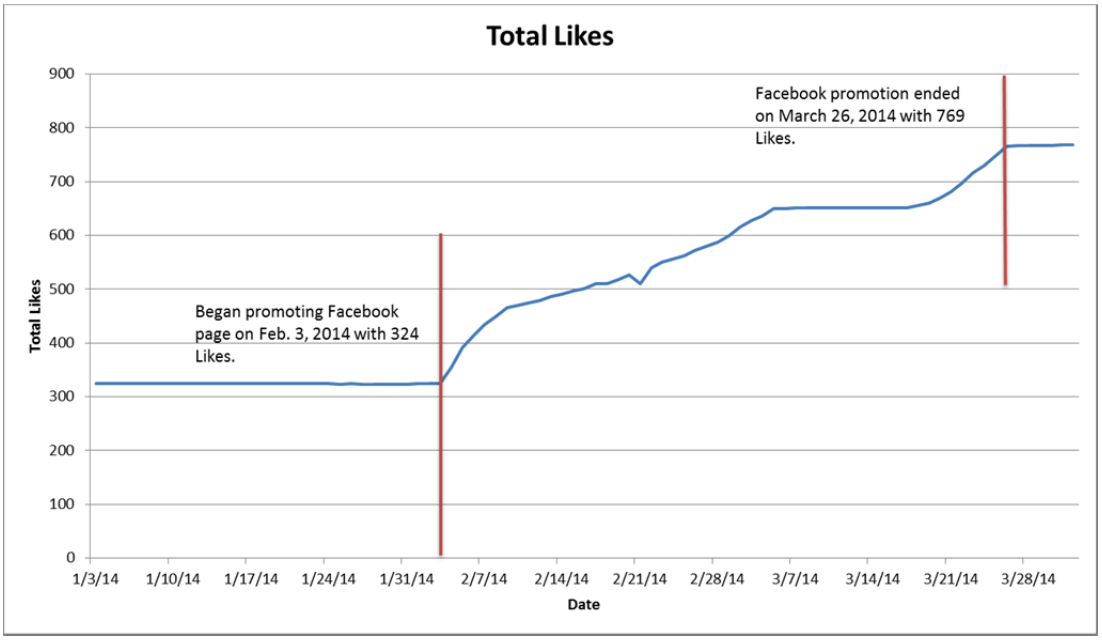

Figure 3. Facebook LIKES increased by more than 400 new LIKES when WFSC paid to promote the TW Facebook page.

Twitter

During the project period, the project team was able to reach 3,492,299 people via Twitter. WFSC utilized Sumall to track and collect data for the TW Twitter (@TrinityWaters) account. WFSC focused on two metrics to calculate reach via Twitter: retweet reach and mention reach. According to Sumall, these two metrics gauge the impact of the tweets and measure how far they potentially travelled.

Mention reach is the number of people who potentially saw your Twitter name (in our case @TrinityWaters) in a tweet sent out by another user to all of their followers. Retweet reach is the number of people who potentially saw your own tweet that was sent out ("retweeted") by another user to all of their followers. Mentions and retweets by other users help to gain new followers, which emphasizes the importance of creative content development. With Sumall we are also able to see who the top influencers are who are retweeting or mentioning the information and

purposely engage those users, in particular the users with the biggest followings. Since the beginning of the social media deployment in June 2011, reach via Twitter is shown in Table 7.

Table 7. Twitter's reach since its deployment in June 2011.

Year	Mentions	Mention Reach	Retweets	Retweet Reach	Total Reach
2011	71	375,934	123	91,416	467,544
2012	235	553,541	387	406,962	961,125
2013	147	274,519	584	375,972	651,222
2014	53	67,487	240	74,987	142,767
Total	**506**	**1,271,481**	**1,334**	**949,337**	**2,222,658**

ScoopIt!

In 2012, IRNR began utilizing a new tool, ScoopIt!, which acts much like an online newspaper. WFSC began administering it shortly thereafter and updated it throughout the life of the project. ScoopIt! functions by allowing the manager to pull articles from the Internet and post them to their ScoopIt! page. When visitors come to the page, they see boxes containing a photo and short description of articles that they can click on and will take them to the original page of the article. The advantage of this tool is that unlike Twitter and Facebook, it does not require an account to view, and it received 1,400 views during the life of the project.

Tumblr

On January 24, 2014, WFSC launched a new social media tool, Tumblr, to further engage audiences. Tumblr is an attractive blogging platform, and a benefit of Tumblr is that the posts are searchable on the web and will remain for a long period of time as opposed to Twitter and Facebook. WFSC is testing this new platform to gauge its effectiveness, but it takes time for blogs to attract and engage audiences. WFSC only had 16 posts on this site as they initiated this tool in the latter part of the project; therefore, reach was limited with this tool.

YouTube

In addition, 28 videos (13 more than the original scope of work) were produced on rangeland and wildlife management that benefit watershed health. These videos were posted on the WFSC YouTube channel and the internet TV site AgSmartTV.org where they were viewed 82,736 times as of August 15, 2014. The video titles and date they were posted on the YouTube channel are listed below in Table 7.

Table 8. Wildlife and Fisheries Extension YouTube channel videos.

	Titles of WFSC AgriLife Extension YouTube Channel Videos	Date Posted	YouTube Views	AgSmart TV Views
1	Feral Hog Management: History, Biology, and Population Dynamics	7/17/2012	556	1,917
2	Feral Hog Impacts on Agriculture and Wildlife in Texas	7/12/2012	715	834
3	Feral Hog Management: Control Techniques and Regulations	7/17/2012	1,171	2,136
4	Exclusion Fencing for Feral Hogs Around Wildlife Feeders	7/17/2012	3,223	27,420
5	Resources for New Landowners in Texas	1/25/2013	617	N/A
6	Strategic Shooting of Feral Hogs for Population Control	2/1/2013	1,471	27,005
7	Rangeland Monitoring Techniques for Livestock and Wildlife	3/7/2013	424	N/A
8	Rangeland Measurement Techniques for Livestock and Wildlife	3/13/2013	449	N/A
9	How to Take a Soil Sample	5/14/2013	1,927	578
10	White-tailed Deer Food Plots on Livestock Operations	6/10/2013	553	N/A
11	White-tailed Deer Food Plots: Soil Considerations	6/10/2013	638	N/A
12	Disking for Wildlife Management	6/12/2013	656	929
13	Shredding/Mowing for Wildlife Management in Texas	7/29/2013	388	839
14	Dead Standing Trees as Wildlife Habitat	3/31/2014	51	175
15	Interpreting White-Tailed Deer Sign: Rubs	4/2/2014	58	216
16	Farm Equipment for Wildlife Food Plots	4/2/2014	171	N/A
17	Preparing a Wildlife Food Plot with a Shredder	4/2/2014	71	178
18	Preparing a Wildlife Food Plot with a Subsoiler	4/2/2014	504	272
19	Preparing a Wildlife Food Plot with a Bottom Plow	4/2/2014	156	176
20	Preparing a Wildlife Food Plot with a Disk Plow	4/2/2014	483	225
21	Preparing a Wildlife Food Plot with a Rototiller	4/2/2014	534	159
22	Preparing a Wildlife Food Plot with a Box Blade	4/2/2014	976	445
23	Preparing a Wildlife Food Plot with a Chain Harrow	4/2/2014	571	199
24	Preparing a Wildlife Food Plot with a Seed Spreader	4/2/2014	213	118
25	Preparing a Wildlife Food Plot with a Roller Packer	4/2/2014	222	131
26	Preparing a Wildlife Food Plot with a Drag	4/2/2014	295	201
27	Preparing a Wildlife Food Plot with a Cultipacker	4/2/2014	355	183
28	Preparing a Wildlife Food Plot with a No-Till Seed Drill	4/2/2014	805	147
		Totals	**18,253**	**64,483**

Evaluation

Pre/post evaluations were developed and disseminated to participants at all project workshops to evaluate changes in stakeholder knowledge and awareness of land stewardship and environmental issues related to water quality.

In addition to the evaluation tool, Turning Point software (remote clickers) was used during the workshops to help engage and evaluate knowledge of landowners throughout the day. This software was used in the Round two workshops and the Summit.

Trinity Workshop Evaluation Impacts

Round One – Corsicana (September 7, 2012; 21 attendees), Athens (October 29, 2012; 11 attendees), Huntsville (November 1, 2012; 9 attendees)
Summary: Of the 41 respondents in Round One, almost all said their knowledge was increased by attending the workshop. Their change in understanding slightly increased. Most were interested in adopting practices to benefit water quality and watershed planning or had already. The Net Promoter Score was low at two locations, the cause of which is unknown due to a lack of feedback from the respondents in that regard. Respondents assigned an economic value to the information provided ranging from a mean of $150 among Athens respondents to a mean of $2,510 among Huntsville respondents. See full results in Appendix B.

Round Two – Corsicana (December 12, 2012; due to only 4 attendees present, evaluation data excluded); Athens (February 5, 2013; 30 attendees); Huntsville (February 8, 2013; 20 attendees)
Summary: Of 50 respondents in Round Two, almost all said their knowledge was increased by attending the workshop. Their change in understanding slightly increased for some components and largely increased for others. A large majority were interested in adopting practices to benefit water quality and watershed planning or had already. The Net Promoter Score was below the agency-wide average for AgriLife Extension at both locations, the cause of which is unknown due to a lack of feedback from the respondents in that regard. Respondents assigned an economic value to the information provided ranging from a mean of $187 among Athens respondents to a mean of $43 among Huntsville respondents. See full results in Appendix D.

Round Three – Corsicana (February 27, 2013; 7 attendees); Athens (April 3, 2013; 17 attendees); Huntsville (March 27, 2013; 6 attendees)
Two evaluations were given at the Round Three workshops: one to evaluate the Lone Star Healthy Streams beef cattle presentations and another to evaluate the feral hog management presentation. See full results in Appendix F.

Lone Star Healthy Streams Evaluation Summary:
Results showed substantial knowledge gains from 30 respondents about the Clean Water Act, water quality standards, and cattle impacts on bacteria levels in waterways. Respondents also had considerable knowledge gains in practices they can do on their land to improve cattle management to benefit water quality. Every respondent was satisfied with the program and plans to implement practices from this workshop on their land.

Feral Hog Evaluation Summary:
Of the 30 respondents in Round Three, almost all said their knowledge was increased by attending the workshop. Their change in understanding increased dramatically from 77% to 96% depending on specific feral hog biology and control topics. Most were interested in adopting practices to benefit water quality and watershed planning or had already. The Net Promoter Score was low at two locations, the cause of which is unknown due to a lack of feedback from the respondents in that regard. Respondents assigned an economic value to the information provided ranging from a mean of $150 among Athens respondents to a mean of $2,510 among Huntsville respondents.

Trinity River Land and Water Summit

Summary: The Trinity River Land and Water Summit concluded the series of workshops in the middle Trinity River basin discussing future water quality and watershed planning. The Summit was held on October 2, 2013, in Athens with 70 participants. See full schedule with presenters and topics in Appendix G.

Summit coordinators used Turning Point software with remote clickers given to participants to promote interactive discussion during the afternoon presentation by the WFSC AgriLife Extension Associate. During this presentation, the presenter obtained knowledge of the participants and their feedback regarding future watershed planning and water quality monitoring in key watersheds of the middle Trinity River basin (Richland-Chambers Reservoir, Catfish Creek, Tehuacana Creek, Upper Keechi Creek and Bedias Creek).

There were 63 active participants during this time with not everyone answering every question. Overall, 94% of attendees reported increased knowledge of water quality and watershed planning by attending the Summit, and 85% wanted more information on implementing practices on their land to benefit water quality and quantity. Responses showed 65% of attendees favored a Recreational Use Attainability Analysis (RUAA)/UAA in Catfish Creek. Only 52% of attendees supported a UAA in Upper Keechi Creek, but 41% said they needed more info. Also, 95% of attendees said they were very likely or likely to recommend AgriLife Extension programs to others. Questions and responses from the question and answer session are given in Appendix H.

Prioritizing watersheds

TW and WFSC, using the GIS inventory and LULC data, worked with stakeholders through the Summit to identify and prioritize a list of watersheds for future WPP development. Stakeholders at the Summit were able to answer questions anonymously utilizing Turning Point remotes through PowerPoint. Richland-Chambers was a watershed that 71% of attendees supported and would participate in developing a WPP in the future.

Attendees were informed that TCEQ is reviewing and evaluating water quality data from Upper Keechi Creek for accuracy. If TCEQ decides to maintain the 303(d) listing of Upper Keechi Creek for depressed DO, attendees recommended applying for funding to allow a third party to conduct more intensive water quality sampling for Upper Keechi Creek to include multiple DO grab samples and 24-hour DO sampling intervals to properly assess DO levels in Upper Keechi Creek. Attendees also recommended applying for funding to conduct an UAA on Upper Keechi Creek to determine appropriate standards for Aquatic Life Use.

Based on recommendations from attendees, three watersheds were prioritized in the middle Trinity: Richland-Chambers Reservoir, Catfish Creek, and Upper Keechi Creek. TRWD is already beginning the process of developing a watershed protection plan as a third party for the Richland-Chambers Reservoir watershed.

TCEQ has identified Catfish Creek (0804G) and Upper Keechi Creek (0804H) as needing a RUAA or UAA to evaluate water quality criteria for the stream. TCEQ staff has stated that they are currently reviewing the data for Upper Keechi Creek, and there is the possibility that it may be taken off the 303(d) list as a result.

The water quality data for Catfish Creek is firmly accepted; therefore, there would be no need to conduct more intensive water quality monitoring since that would not result in the delisting of Catfish Creek for the DO and bacteria impairments. The Catfish Creek watershed is largely undeveloped and livestock production and wildlife management are the main land use activities. For these reasons, Summit attendees decided that a UAA and RUAA should be conducted to determine the proper Aquatic Life Use and Recreational Use standards for it.

Since TRWD is beginning the process of developing a WPP for Richland-Chambers Reservoir, and UAAs/RUAAs will be conducted for Upper Keechi Creek and Catfish Creek, it was decided not to move forward with developing WPPs for those watersheds at this time.

Conclusion

Through this project, 3,950,851 contacts were informed about the Trinity project's goals to advance the restoration and protection of water quality within the Trinity River basin, introduced to educational products and online resources, and educated about water quality management in the middle Trinity River basin. Of this total, 196,297 contacts were made through presentations at workshops and webinars and by operating vendor booths, while an additional 3,754,554 contacts were made through the website and social media outlets during the project.

This project set out to develop educational resources and deliver educational programs to increase water quality and BMP awareness to targeted stakeholders in the Trinity River basin. These materials were made easily accessible to the public, landowners, decision makers, and others through development of an interactive website and frequently promoted through various social media outlets. The Trinity project successfully accomplished this goal through the coordination of nine public workshops in the middle Trinity River basin that culminated in the Trinity River Land and Water Summit. Overall, evaluation results indicate that participants at the nine workshops and Summit had a 92% increase in knowledge and nearly all participants reported that they would take at least one action to benefit water quality as a result of the program. Increased awareness of water quality, watershed concepts and different conservation approaches is expected to yield increased implementation of best management practices in the middle basin and has laid the foundation for WPP development in the future.

The educational resources and outreach efforts developed through this project greatly amplified the "All Things Trinity, All Things Conservation" message to middle basin stakeholders. Resources included three webinars, four Extension publications, 31 YouTube videos, and the effective use of four social media outlets (Facebook, Twitter, Scoop.it! and Tumblr). The interactive website serves as a clearinghouse of information for these resources and many others and has had more than 15,000 unique visitors during the project period. TRIMS has become a popular land management tool for landowners to utilize and has been visited 11,736 times by 10,279 unique visitors during the project period. The landowner database was created to enhance communication among landowners and other stakeholders in the middle Trinity River basin and currently has information for 336 contacts.

The webinar series had greater participation than the workshops, and the team found this to be a more effective method for disseminating information for regional projects. Using social media with an effective strategy proved beneficial for this project to greatly amplify the conservation message, connect with stakeholders, and promote educational resources. Having a vigorous social media campaign and user-friendly website should be considered a necessity in future projects such as this.

At this time, stakeholders are not seeking to develop a WPP as a result of this project. The TRWD has begun development of a WPP in the Richland-Chambers Reservoir watershed. Stakeholders would prefer to allow the TCEQ or a third party to conduct an RUAA and/or UAA for Catfish Creek and Upper Keechi Creek. Doing so will establish the appropriate standard for contact recreation and aquatic life uses to address the bacteria and dissolved oxygen impairments in those creeks. TCEQ has communicated that they are currently reviewing the data from Upper

Keechi Creek, and if they find that data is insufficient or was not taken properly, the creek will result in its removal from the *303(d) List*.

Although a WPP will not be developed at this time as a result of this project, the goal of increasing water quality awareness and creation of educational resources has laid the foundation for future WPP development in the middle Trinity River basin, especially for the Richland-Chambers Reservoir watershed. Also, the project's ultimate goal of improving water quality in the middle Trinity River basin is aided by the fact that nearly all participants in the workshop series indicated they would voluntarily adopt BMPs as a result of the information brought by the program.

APPENDIX A. Round 1 Workshops Agenda and Evaluation

Cooperative Conservation in the Trinity River Basin

October 29, 2012
Texas Freshwater Fisheries Center, Athens TX

7:30 – 8:00 a.m.	**Registration and Refreshments**
8:00 – 8:10 a.m.	**Welcome and Purpose** Ken Klaveness, Trinity Waters
8:10 – 8:40 a.m.	**All Things Trinity, All Things Conservation** Blake Alldredge, Texas A&M AgriLife Extension Service
8:40 – 9:40 a.m.	**What is a Watershed?** Jennifer Peterson, Texas A&M AgriLife Extension Service
9:40 – 9:55 a.m.	**Break**
9:55 – 10:55 a.m.	**Water Quality Basics and Protection in Texas** Galen Roberts, Texas A&M AgriLife Extension Service
10:55 – 11:25 a.m.	**Watershed Management Benefits to Society** Michelle Clark and Angela Kilpatrick, Trinity River Authority
11:25 – 11:55 a.m.	**Watershed Management Benefits to Landowners** Brian Smith, Trinity Waters
12:00 p.m.	**Administer Evaluation and Adjourn**

Sponsored by: Trinity Waters land. water. life. | Texas A&M AgriLife Extension | Soil Water TSSWCB

AgriLIFE EXTENSION
Texas A&M System

MARKING INSTRUCTIONS
CORRECT: ● INCORRECT: ⊘ ⊗ ◒ ◓

Cooperative Conservation in the Trinity River Basin Program Evaluation

Your views on the quality and effectiveness of Extension programs are extremely important. Please take a few minutes to tell us about your experience with this meeting. Your answers to the following questions will help us better meet your needs.

1. ***Did you increase your knowledge of water quality and watershed management principles by attending this program?***

   ○ Yes ○ No

2. ***For each item listed below, mark the ONE number in the column that best describes your level of understanding BEFORE the program; and then mark the ONE number in the column that best describes your level of understanding AFTER the program.***

None 1 Poor 2 Fair 3 Good 4 Excellent

Topics	BEFORE Program 1 2 3 4 5	AFTER Program 1 2 3 4 5
Basic functions and features of watershed systems	○ ○ ○ ○ ○	○ ○ ○ ○ ○
Types and potential sources of water quality concerns in Texas	○ ○ ○ ○ ○	○ ○ ○ ○ ○
Awareness of water quality issues in the Trinity River basin	○ ○ ○ ○ ○	○ ○ ○ ○ ○
History of water quality protection and available resources in Texas (agencies/organizations)	○ ○ ○ ○ ○	○ ○ ○ ○ ○
Strategies for improving and/or protecting water quality in Texas (Watershed Protection Plan, Total Maximum Daily Load, Other)	○ ○ ○ ○ ○	○ ○ ○ ○ ○

3. ***Please indicate your plans to take actions(s) within the next 6 months.***

Actions	Yes	No	Already Adopted
Learn more about landowner organizations such as Trinity Waters	○	○	○
Communicate water issues with elected officials	○	○	○
Employ land management practices that benefit water quality/quantity	○	○	○
Help develop a plan for my watershed (WPP, TMDL)	○	○	○

31373

Please continue on the back.

4. ***What economic value would you assign to the knowledge you gained by attending this program?***

$ ☐☐☐☐☐☐☐ ***(Total amount in dollars)***

5. ***Based on the information presented, would you recommend Texas A&M AgriLife Extension Service to your family, friends and colleagues as a contact for information on watershed management? Please fill in one number.***

○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10
Not Likely				*Somewhat Likely*					**Very Likely**

6. ***What is the main activity of the land operation you currently own or work for? <u>Please select only one.</u>***

- ○ Livestock Production
- ○ Crop Farming
- ○ Wildlife Management
- ○ Personal Recreation/Enjoyment
- ○ None of the available choices
- ○ I do not own or work for a land operation

THANK YOU!

31373

APPENDIX B. Round 1 Evaluation Results

Knowledge Gains:
Q1 Did you increase your knowledge of water quality and watershed management principles by attending this program?

Corsicana – 84.6%; Athens – 72.7%; Huntsville – 100%

Percent Change in Understanding

Q2a Basic functions and features of watershed systems

Corsicana – 80%; Athens – 54.5%; Huntsville – 55.6%

Q2b Types and potential sources of water quality concerns in Texas

Corsicana – 66.7%; Athens – 50%; Huntsville – 66.7%

Q2c Awareness of water quality issues in the Trinity River Basin

Corsicana – 80%; Athens – 72.7%; Huntsville – 77.8%

Q2d History of water quality protection and available resources in Texas

Corsicana – 66.7%; Athens – 72.7%; Huntsville – 88.9%

Q2e Strategies for improving and/or protecting water quality in Texas (WPP, TMDL)

Corsicana – 86.7%; Athens – 72.7%; Huntsville – 66.7%

Practice Adoption:

Q3a Learn more about landowner organizations such as Trinity Waters

Location	Response	Valid Percent	Cumulative Percent
Corsicana	'Yes'	66.7	93.4
	'Already Adopted'	26.7	
Athens	'Yes'	72.7	90.9
	'Already Adopted'	18.2	
Huntsville	'Yes'	100	100
	'Already Adopted'	0	

Q3b Communicate water issues with elected officials

Location	Response	Valid Percent	Cumulative Percent
Corsicana	'Yes'	46.7	66.7
	'Already Adopted'	20	
Athens	'Yes'	45.5	54.6
	'Already Adopted'	9.1	
Huntsville	'Yes'	100	100
	'Already Adopted'	0	

Q3c Employ land management practices that benefit water quality/quantity

Location	Response	Valid Percent	Cumulative Percent
Corsicana	'Yes'	57.1	92.8
	'Already Adopted'	35.7	
Athens	'Yes'	72.7	100
	'Already Adopted'	27.3	
Huntsville	'Yes'	100	100
	'Already Adopted'	0	

Q3d Help develop a plan for my watershed (WPP, TMDL)

Location	Response	Valid Percent	Cumulative Percent
Corsicana	'Yes'	53.3	66.6
	'Already Adopted'	13.3	
Athens	'Yes'	50.0	78.2
	'Already Adopted'	18.2	
Huntsville	'Yes'	100	100
	'Already Adopted'	0	

Total number of actions you plan to take (out of 4 possible)

Corsicana – mean 2.2; Athens – mean 2.36; Huntsville – mean 2.56

Economics:
What economic value would you assign to the knowledge you gained by attending this program?

Corsicana – mean $1,258.33
Athens – mean $150
Huntsville – mean $2,510

Customer Satisfaction: Net Promoter Score (Score) is measure of clientele loyalty. Score is calculated from responses to one simple question, measured on a 0-to-10 rating scale: “Would you recommend us to a friend or colleague?” Based on the Score, each client is placed into one of three categories: promoters, passives, and detractors. Ultimately, the goal of using the Score is to increase promoters and decrease detractors. The goal is to maintain Score within 50-80% or more. The average for AgriLife Extension programs is 72.0.

Corsicana Score = 20
Athens Score = 20
Huntsville Score = 77.8

APPENDIX C. Round 2 Workshops Agenda and Evaluation

Cooperative Conservation in the Trinity River Basin

February 5, 2013
Texas Freshwater Fisheries Conservation Center, 5301 CR 4812, Athens

12:30 – 1 pm.	**Registration and Refreshments**
1:00 – 1:10 pm	**Welcome and Purpose** Ken Klaveness, Trinity Waters
1:10 – 1:40 pm	**All Things Trinity, All Things Conservation** Blake Alldredge, Texas A&M AgriLife Extension Service
1:40 – 2:10 pm	**Land Use and Ownership Trends in the Trinity River Basin** Blake Alldredge, Texas A&M AgriLife Extension Service
2:10 – 2:20 pm	**Break**
2:20 – 3:20 pm	**Texas Pollutant Discharge Elimination System Permit Requirements for Pesticide Applicators** Dr. Don Renchie, Texas A&M AgriLife Extension Service
3:20 – 4:20 pm	**Land Management with the Trinity River Information Management System** Kevin Skow and Amanda Anderson Texas A&M Institute of Renewable Natural Resources
4:20 – 4:30 pm	**Break**
4:30 – 5:00 pm	**Benefits of Developing a Water Quality Management Plan** Lee Munz, Texas State Soil and Water Conservation Board
5:00 pm	**Administer Evaluation and Adjourn**

Sponsored by: Trinity Waters land. water. life. | Texas A&M AgriLife Extension | Soil Water TSSWCB

TEXAS A&M AGRILIFE EXTENSION

MARKING INSTRUCTIONS
CORRECT: ● INCORRECT: ⊘ ⊗ ◒ ◔

Cooperative Conservation in the Trinity River Basin Program Evaluation

Your views on the quality and effectiveness of Extension programs are extremely important. Please take a few minutes to tell us about your experience with this meeting. Your answers to the following questions will help us better meet your needs.

1. ***Did you increase your knowledge of land management principles that benefit water, wildlife, and agriculture by attending this program?***

   ○ Yes ○ No

2. ***For each item listed below, mark the ONE number in the column that best describes your level of understanding BEFORE the program; and then mark the ONE number in the column that best describes your level of understanding AFTER the program.***

None 1 Poor 2 Fair 3 Good 4 Excellent 5

Topics	BEFORE Program 1	2	3	4	5	AFTER Program 1	2	3	4	5
Awareness of water quality issues in the Trinity River Basin	○	○	○	○	○	○	○	○	○	○
Land use and fragmentation impacts on water resources and wildlife habitat	○	○	○	○	○	○	○	○	○	○
Using the Trinity River Information Management System mapping tool for managing land	○	○	○	○	○	○	○	○	○	○
Developing a Water Quality Management Plan with TSSWCB	○	○	○	○	○	○	○	○	○	○
Texas Pollutant Discharge Elimination System permit requirements for pesticide applicators	○	○	○	○	○	○	○	○	○	○

3. ***Please indicate your plans to take actions(s) within the next 6 months.***

Actions	Yes	No	Already Adopted
Learn more about landowner organizations such as Trinity Waters	○	○	○
Communicate water issues with elected officials	○	○	○
Employ land management practices that benefit water quality/quantity	○	○	○
Help develop a plan for my watershed (Watershed Protection Plan, Total Maximum Daily Load)	○	○	○

1419

Please continue on the back.

4. ***What economic value would you assign to the knowledge you gained by attending this program? (How much would you pay to attend?***

$ | | | | | | | | ***(Total amount in dollars)***

5. ***Based on the information presented, would you recommend Texas A&M AgriLife Extension Service to your family, friends and colleagues as a contact for information on watershed management? Please fill in one number.***

O 1 O 2 O 3 O 4 O 5 O 6 O 7 O 8 O 9 O 10

Not Likely *Somewhat Likely* **Very Likely**

6. ***What is the main activity of the land operation you currently own or work for? <u>Please select only one.</u>***

O Livestock Production
O Crop Farming
O Wildlife Management
O Personal Recreation/Enjoyment
O Timber Production
O None of the available choices
O I do not own or work for a land operation

APPENDIX D. Round 2 Evaluation Results

Knowledge Gains:

Q1 Did you increase your knowledge of land management principles that benefit water, wildlife, and agriculture by attending this program?

Athens – 100%; Huntsville – 93%

Percent Change in Understanding

Q2a Awareness of water quality issues in the Trinity River Basin

Athens – 86.4%; Huntsville – 80.0%

Q2b Land use and fragmentation impacts on water resources and wildlife habitat

Athens – 91.7%; Huntsville – 66.7%

Q2c Using the Trinity River Information Management System mapping tool for managing land

Athens – 100%; Huntsville – 86.7%

Q2d Developing a Water Quality Management Plan with TSSWCB

Athens – 87.0%; Huntsville – 80%

Q2e Texas Pollutant Discharge Elimination System permit requirements for pesticide applicators

Athens – 91.3%; Huntsville – 93.3%

Practice Adoption:

Q3a Learn more about landowner organizations such as Trinity Waters

Location	Response	Valid Percent	Cumulative Percent
Athens	'Yes'	95.5	100
	'Already Adopted'	4.5	
Huntsville	'Yes'	85.7	100
	'Already Adopted'	14.3	

Q3b Communicate water issues with elected officials

Location	Response	Valid Percent	Cumulative Percent
Athens	'Yes'	57.1	66.6
	'Already Adopted'	9.5	
Huntsville	'Yes'	42.9	78.6
	'Already Adopted'	35.7	

Q3c Employ land management practices that benefit water quality/quantity

Location	Response	Valid Percent	Cumulative Percent
Athens	'Yes'	82.6	100
	'Already Adopted'	17.4	
Huntsville	'Yes'	57.1	100
	'Already Adopted'	42.9	

Q3d Help develop a plan for my watershed (WPP, TMDL)

Location	Response	Valid Percent	Cumulative Percent
Athens	'Yes'	61.9	71.4
	'Already Adopted'	9.5	
Huntsville	'Yes'	50	64.3
	'Already Adopted'	14.3	

Total number of actions you plan to take (out of 4 possible)

Athens – mean 2.91; Huntsville – mean 2.29

Economics:
What economic value would you assign to the knowledge you gained by attending this program?
Athens – mean $187.31
Huntsville – mean $43.46

Customer Satisfaction:
Athens NPS = 66.6
Huntsville NPS = 46.6

APPENDIX E. Round 3 Workshops Agenda and Evaluation

Cooperative Conservation in the Trinity River Basin

April 3, 2013
Texas Freshwater Fisheries Conservation Center, Athens, TX

12:30 – 1 pm.	**Registration and Refreshments**
1:00 – 1:10 pm	**Welcome and Purpose** Blake Alldredge, Texas A&M AgriLife Extension Service
1:10 – 1:40 pm	**All Things Trinity, All Things Conservation** Blake Alldredge, Texas A&M AgriLife Extension Service
1:40 – 2:40 pm	**Drought Management for Cattle Producers** Dr. Larry Redmon, Texas A&M AgriLife Extension Service
2:40 – 2:50 pm	**Break**
2:50 – 3:50 pm	**Lone Star Healthy Streams** Dr. Larry Redmon, Texas A&M AgriLife Extension Service
3:50 – 4:50 pm	**Feral Hog Management in Texas** Dr. Billy Higginbotham, Texas A&M AgriLife Extension Service
4:50 – 5:05 pm	**Update on Cost Share Programs through Farm Bill** Julie Moore, Natural Resources Conservation Service
5:05 pm	**Administer Evaluation and Adjourn**

Sponsored by: Trinity Waters land. water. life. | Texas A&M AgriLife Extension | Soil Water TSSWCB

Lone Star Healthy Streams
Program Evaluation

We hope that you have enjoyed this program. Would you please take just a few moments to complete this evaluation? In doing so, you will help us make improvements to the program. THANK YOU!

1. For each item listed below, mark the ONE number in the left column that best describes your level of understanding BEFORE the program; and then mark the ONE number in the right column that best describes your level of understanding AFTER the program.

Poor	Fair	Good	Excellent
1	2	3	4

	BEFORE Program				AFTER Program			
	1	2	3	4	1	2	3	4
The Federal Clean Water Act requires specific water standards for each state, including Texas.	Θ	Θ	Θ	Θ	Θ	Θ	Θ	Θ
A waterbody not meeting water quality standards (impaired waterbody) is placed on what is known as the 303(d) list.	Θ	Θ	Θ	Θ	Θ	Θ	Θ	Θ
Once a waterbody is placed on the 303(d) list, a plan to improve the water quality is put in place known as a Total Maximum Daily Load (TMDL).	Θ	Θ	Θ	Θ	Θ	Θ	Θ	Θ
E. coli are bacteria that cause both food-borne and water-borne illnesses.	Θ	Θ	Θ	Θ	Θ	Θ	Θ	Θ
E. coli is an indicator organism for additional organisms that can cause water-borne illnesses.	Θ	Θ	Θ	Θ	Θ	Θ	Θ	Θ
Water quality regarding bacteria is determined by testing for *E. coli*.	Θ	Θ	Θ	Θ	Θ	Θ	Θ	Θ
There are many sources of bacteria that can impair a waterbody, including livestock.								
Riparian areas are environmentally sensitive areas along streams and rivers.	Θ	Θ	Θ	Θ	Θ	Θ	Θ	Θ
There are Best Management Practices (BMPs) I can implement on my property to protect riparian areas.	Θ	Θ	Θ	Θ	Θ	Θ	Θ	Θ
There are various sources of cost-share funds to assist my implementation of BMPs designed to protect riparian areas.	Θ	Θ	Θ	Θ	Θ	Θ	Θ	Θ

2. Overall, how satisfied are you with this educational program activity?
   Θ Not at all Θ Slightly Θ Somewhat Θ Mostly Θ Completely

3. What did you like most about this educational program activity?

   _____

4. What did you like least about this educational program activity?

   _____

5. Would you recommend this particular educational program activity to others?
   Θ Yes Θ No

6. How likely are you to adopt one or more of the BMPs presented in today's program designed to improve water quality?
   Θ Likely Θ Not likely

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AgriLIFE EXTENSION
Texas A&M System

MARKING INSTRUCTIONS
CORRECT: ● INCORRECT: ⊘ ⊗ ◒ ◓

FERAL HOG DAMAGE AND CONTROL SURVEY

You have recently participated in a program on feral hog life history, behavior and control information hosted by the Texas AgriLife Extension Service. Please complete the following on the economic impact of feral hogs and the value of information you received. Your survey will assist us in planning future programs.

1. Please mark all of the areas in which feral hogs had negative impacts on your property in the past year.
   - O Growing or planting commodity crop losses
   - O Growing or planting specialty crop losses
   - O Stored Commodities
   - O Pastures
   - O Wetlands
   - O Livestock (injury, deaths, diseases)
   - O Fences, water troughs, or other improvements
   - O Equipment or vehicles
   - O Personal injuries
   - O Loss of land value
   - O Loss of lease value, damage to food plots/feeders
   - O Owner or employee time

2. Please mark all of the control methods you use on your property(s).
   - O Trapped & destroyed
   - O Trapped & moved from premise
   - O Other (snares, aerial gunning)
   - O Trapped & Sold
   - O Owner/Employee hunting
   - O Lease hunting
   - O Use of dogs

3. "Please estimate your total economic losses due to feral hogs during the ***previous year*** on all your property(s). This includes all items marked above in Question 1. $ [ ][ ][ ][ ][ ][ ] (dollars only)

4. **As a result of implementing what you learned at Texas AgriLife Extension Service workshop(s)**, what do you expect your losses due to feral hogs to be approximately during the **upcoming year**? $ [ ][ ][ ][ ][ ][ ] (dollars only)

5. How much income did you make by trapping and selling hogs and/or leasing hog hunting rights last year? $ [ ][ ][ ][ ][ ][ ] (dollars only)

6. Did you increase your knowledge of feral hogs and their control by attending this program? O Yes O No

7. Rate your knowledge **before and after** the program on these subjects. Mark only one number for each answer choice with 1 = no little knowledge, 3 = some knowledge, 5 = high level of knowledge.

TOPICS	Before the Meeting	After the Meeting
a. Feral hog biology	O1 O2 O3 O4 O5	O1 O2 O3 O4 O5
b. Legal control options	O1 O2 O3 O4 O5	O1 O2 O3 O4 O5
c. Efficient trap/bait techniques	O1 O2 O3 O4 O5	O1 O2 O3 O4 O5
d. Types/extent of hog damage	O1 O2 O3 O4 O5	O1 O2 O3 O4 O5

8. Please mark all practices that you plan to adopt in order to better manage feral hogs on your property:
   - O Use larger traps
   - O Use baits with scent appeal
   - O Vary/change baits at different locations
   - O Set traps whenever fresh sign appears.
   - O Pre-bait traps to encourage consistent hog visits
   - O Scout for hog sign (tracks, wallows, rubs, hair)
   - O Wear eyewear and gloves during field dressing
   - O Market trapped hogs to processors to recoup losses

9. Based on the information provided at the program, what is the likelihood that you would recommend Texas AgriLife Extension Service (includes Wildlife Services) to your family and friends as a contact for information on feral hogs and their control? Mark one number below with 0 = not likely and 10 = likely.

O 0 O 1 O 2 O 3 O 4 O 5 O 6 O 7 O 8 O 9 O 10

Not Likely **Likely**

APPENDIX F. Round 3 Evaluation Results

Lone Star Healthy Streams Evaluation

Percent Change in Understanding:

Q1a Federal Clean Water Act requires specific water standards for each state, including Texas.

Corsicana – 100%; Athens – 77%; Huntsville – 100%

Q1b A waterbody not meeting water quality standards (impaired waterbody) is placed on what is known as 303(d) list.

Corsicana – 86%; Athens – 85%; Huntsville – 100%

Q1c Once a waterbody is placed on the 303(d) list, a plan to improve the water quality is put in place known as a Total Maximum Daily Load (TMDL).

Corsicana – 86%; Athens – 93%; Huntsville – 66%

Q1d *E. coli* are bacteria that cause both food-borne and water-borne illnesses.

Corsicana – 72%; Athens – 47%; Huntsville – 50%

Q1e *E. coli* is an indicator organism for additional organisms that can cause water-borne illnesses.

Corsicana – 72%; Athens – 84%; Huntsville – 84%

Q1f Water quality regarding bacteria is determined by testing for *E. coli*.

Corsicana – 86%; Athens – 71%; Huntsville – 100%

Q1h Riparian areas are environmentally sensitive areas along streams and rivers.

Corsicana – 66%; Athens – 71%; Huntsville – 66%

Q1i There are Best Management Practices (BMPs) I can implement on my property to protect riparian areas.

Corsicana – 86%; Athens – 71%; Huntsville – 66%

Q1j There are various sources of cost-share funds to assist my implementation of BMPs designed to protect riparian areas.

Corsicana – 86%; Athens – 84%; Huntsville – 84%

Customer Satisfaction:

Q2 Overall, how satisfied are you with this educational program activity? (Mostly Satisfied and Completely Satisfied are included)

Corsicana – 100%; Athens – 93%; Huntsville – 100%

Q5 Would you recommend this particular educational program activity to others? (YES responses)

Corsicana – 100%; Athens – 100%; Huntsville – 100%

Practice Adoption:

Q6 How likely are you to adopt one or more of the BMPs presented in today's program designed to improve water quality? (Responded 'Likely')

Corsicana – 100%; Athens – 100%; Huntsville – 100%

Feral Hog Evaluation

Damage Reported (% of respondents, average of 3 locations)

Pastures – 92%
Fences, water troughs or other improvements – 31%
Owner/employee time – 42%
Commodity crops – 15%
Loss of hunting lease value, wildlife food plots/feeders – 7%
Wetlands – 19%
Loss of land value – 7%
Equipment/vehicles – 7%
Specialty crops – 7%
Livestock Injuries – 0%
Stored commodities – 3%
Personal injuries – 0%

Landowner Initiated Control Efforts

Trapped and destroyed – 35%

Owner/Employee hunting – 54%
Use of catch dogs – 19%
Trapped and sold – 15%
Trapped and moved from premises – 19%
Lease hunting – 7%
Other (Snares/aerial gunning) – 15%

Practice Adoption (% of respondents)

Use larger traps – 58%
Pre-bait traps to encourage consistent feral swine visits – 50%
Scout for feral swine – 31%
Use baits with scent appeal – 38%
Market trapped feral swine to offset economic impacts – 50%
Set traps whenever fresh sign appears – 23%
Vary/change baits used in traps at different locations – 31%
Use protective eyewear/gloves during field dressing as a disease precaution – 27%

Mean number of management practices to be adopted per respondent – 2.95

Knowledge Gains

Increases in knowledge based on specific subjects (before vs after program)
- Feral hog biology – 96%
- Legal control options – 73%
- Efficient trap/bait techniques – 88%
- Types/extent of hog damage – 77%

Respondents increasing general knowledge of feral hogs and their control – 92%

Economics

As a result of implementing what they learned at the workshop, respondents gave their expectation of what losses due to feral hogs would be next year as compared to the previous year.

Corsicana – 50% reduction in damage costs, 50% same amount of damage costs
Athens – 57% reduction or same amount of damage costs
Huntsville – 100% reduction in damage costs

Customer Satisfaction

Net Promoter Score
Corsicana – 25; Athens – 58.4; Huntsville – 66.7

APPENDIX G. Trinity River Land and Water Summit Agenda

Trinity River Land and Water Summit

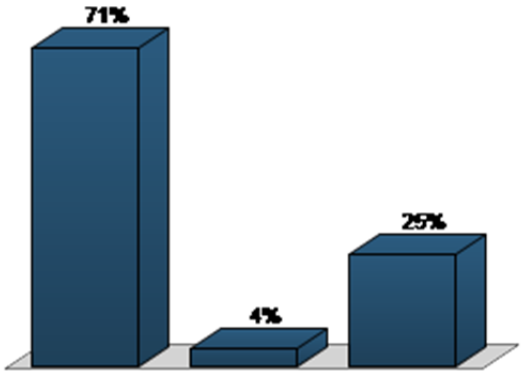
Connecting Rural Land Stewardship to Urban Water Needs

8:00-9:00	**Registration and Breakfast – Sponsored by Heritage Land Bank**
Morning Session	
9:00-9:10	Welcome Remarks - Overall Trinity Waters Vision
	Ken Klaveness, Executive Director, Trinity Waters
9:10-9:40	Treasuring the Trinity: Challenges and Opportunities
	Blake Alldredge, Texas A&M AgriLife Extension Service
9:40-10:10	Watershed Planning in the Upper Trinity River Basin
	Darrel Andrews, Tarrant Regional Water District
10:20-10:40	Break and Interact with Exhibitors
10:40-11:10	Conservation Benefits to Society
	Meredith Miller, Meadows Center for Water and the Environment
11:10-11:40	Cattle Producers and Water Quality Planning
	Keynote, Bob McCan, National Cattlemen's Beef Association
11:40-12:40	**Lunch – Sponsored by AgriLand Farm Credit**
Afternoon Session	
12:10-12:40	Why Should We Monitor the Watershed? The Value of Watershed Monitoring
	Dr. Bill Fox, Texas A&M AgriLife Research
1:10-2:00	Panel Discussion - Urban and Rural Water Connections and Solutions
	-Gary Price, 77 Ranch
	-Dr. Robert McFarlane, Big Woods on the Trinity
	-Bob Hunt, MillerCoors
	-Darrel Andrews, Tarrant Regional Water District
2:00 – 3:00	Discussion with Audience to Prioritize Future Watershed Planning in the Middle Trinity River Basin
	Facilitated by Blake Alldredge, Texas A&M AgriLife Extension Service
3:00 – 3:30	Private Lands Provide Public Benefits
	Todd Staples, Texas Agriculture Commissioner
3:30 – 4:00	Wrap-Up Discussion with Audience
4:00	Closing Remarks
	Ken Klaveness, Trinity Waters

APPENDIX H. Trinity River Land and Water Summit Evaluation Questions and Results

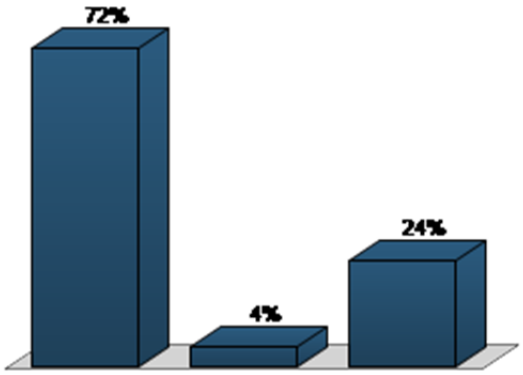
1. Would you support the development of a Watershed Protection Plan in Richland-Chambers Reservoir watershed? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	71.15%	37
No	3.85%	2
Need more info	25%	13
Totals	100%	52



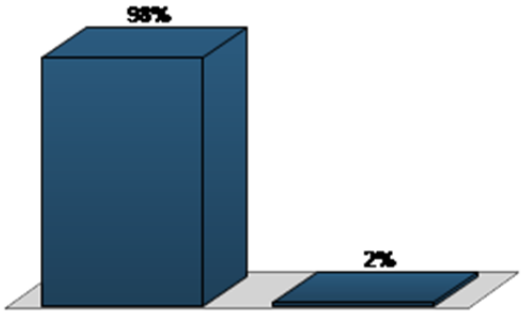
2. Would you participate in the development of a Watershed Protection Plan? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	71.74%	33
No	4.35%	2
Not sure	23.91%	11
Totals	100%	46



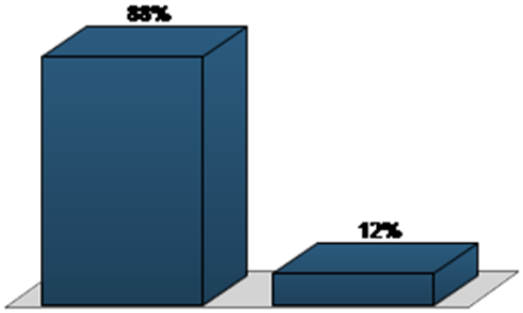
3. Do you see a need for more education related to watershed or water quality management? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	98.15%	53
No	1.85%	1
Totals	100%	54



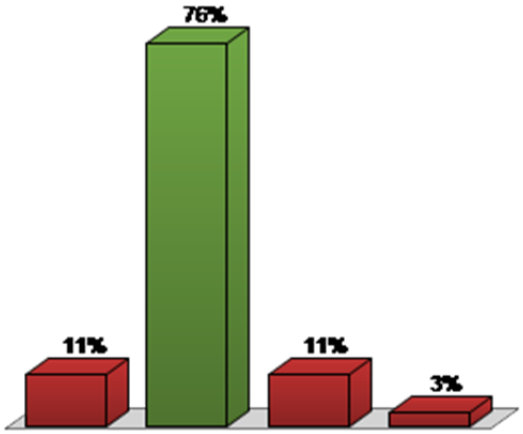
4. Do you see the need for more education on watershed or water quality management topics? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	88.37%	38
No	11.63%	5
Totals	100%	43



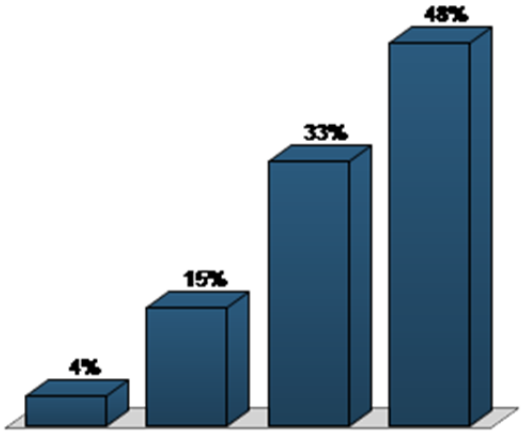
5. What does a UAA/RUAA accomplish? (Multiple Choice)

	Responses	
	Percent	**Count**
Enacts regulation	10.53%	4
Determines correct water quality standards *(correct)*	76.32%	29
Nothing	10.53%	4
Bring more recreation to creek	2.63%	1
Totals	100%	38



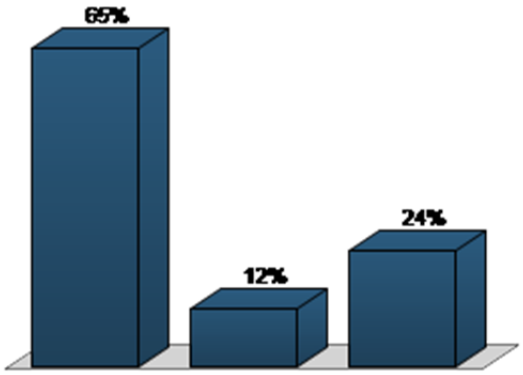
6. How often is Catfish Creek used for swimming, canoeing, etc.? (Multiple Choice)

	Responses	
	Percent	**Count**
Very frequent	3.7%	1
Frequent	14.81%	4
Not frequent	33.33%	9
None or very little	48.15%	13
Totals	100%	27



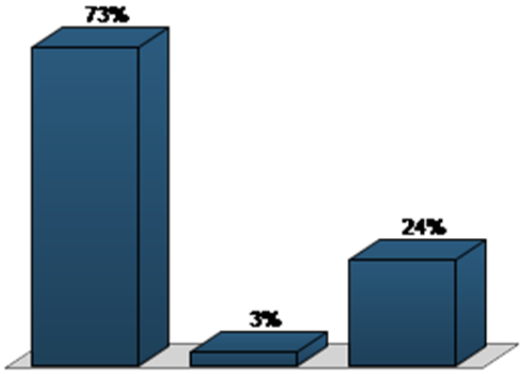
7. Would you support a UAA/RUAA to address WQ standards in Catfish Creek? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	64.71%	22
No	11.76%	4
Need more info	23.53%	8
Totals	100%	34



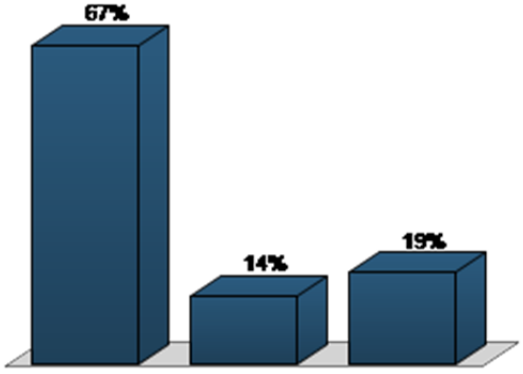
8. Would you like to have a UAA/RUAA meeting held in the Catfish Creek watershed? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	72.73%	24
No	3.03%	1
Not sure	24.24%	8
Totals	100%	33



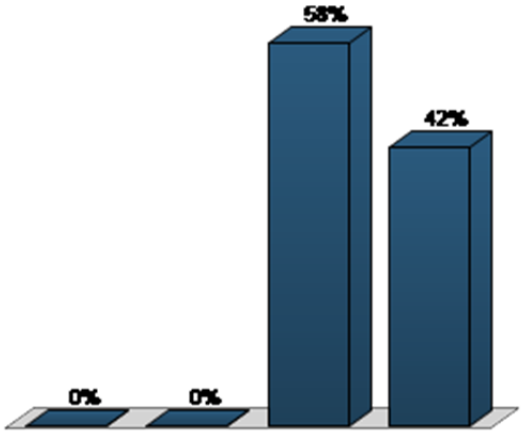
9. Would you be willing to allow those conducting RUAA/UAA onto your property to access Catfish Creek? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	66.67%	14
No	14.29%	3
Need more information	19.05%	4
Totals	100%	21



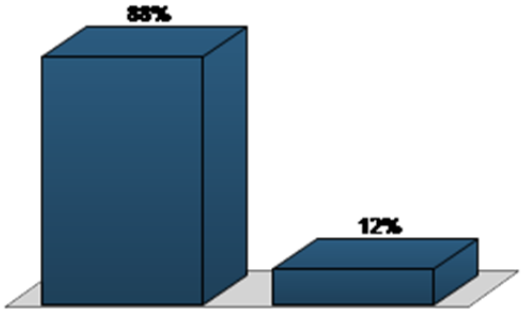
10. How often is Upper Keechi Creek used for swimming, canoeing, etc.? (Multiple Choice)

	Responses	
	Percent	**Count**
Very frequent	0%	0
Frequent	0%	0
Not frequent	57.89%	11
None or very little	42.11%	8
Totals	100%	19



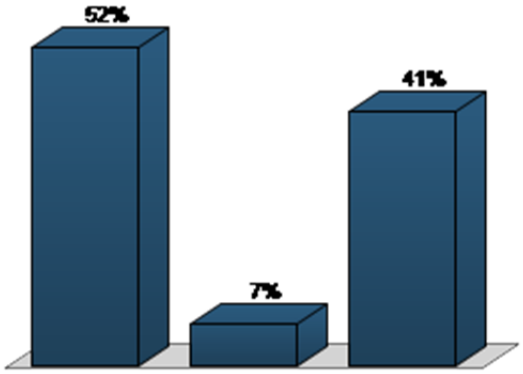
11. Would you support more intensive water quality sampling? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	87.5%	28
No	12.5%	4
Totals	100%	32



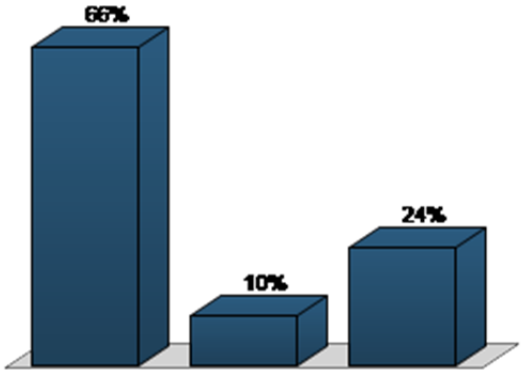
12. Would you support a UAA to address WQ standards in Upper Keechi Creek? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	51.72%	15
No	6.9%	2
Need more info	41.38%	12
Totals	100%	29



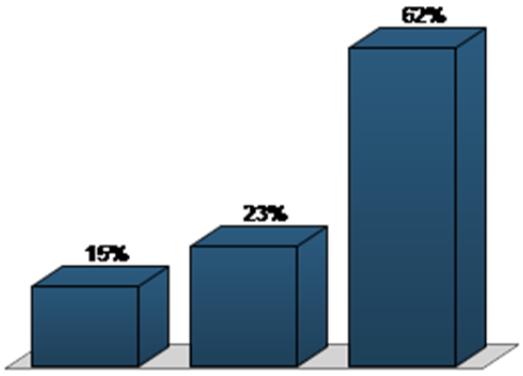
13. Would you like to have a UAA meeting held in the Upper Keechi Creek watershed? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	65.52%	19
No	10.34%	3
Not sure	24.14%	7
Totals	100%	29



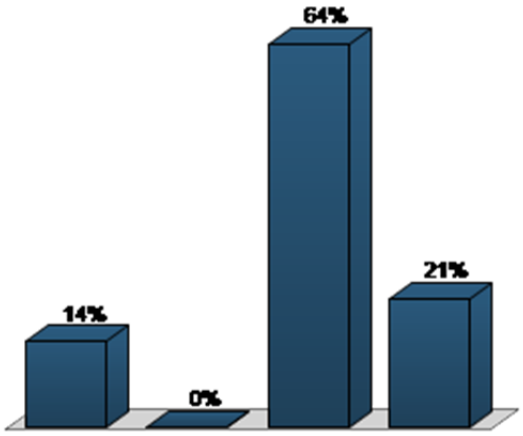
14. Would you be willing to allow those conducting RUAA/UAA onto your property to access Upper Keechi Creek? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	15.38%	2
No	23.08%	3
Need more information	61.54%	8
Totals	100%	13



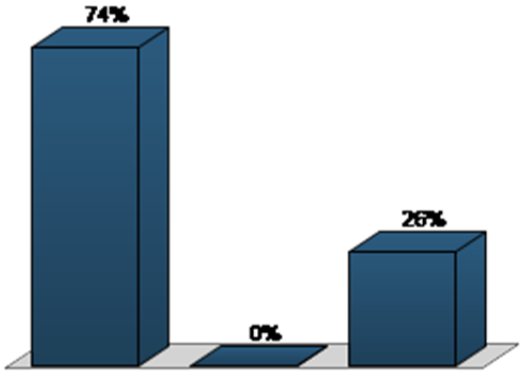
15. How often is Bedias Creek used for swimming, canoeing, etc.? (Multiple Choice)

	Responses	
	Percent	**Count**
Very frequent	14.29%	2
Frequent	0%	0
Not frequent	64.29%	9
None or very little	21.43%	3
Totals	100%	14



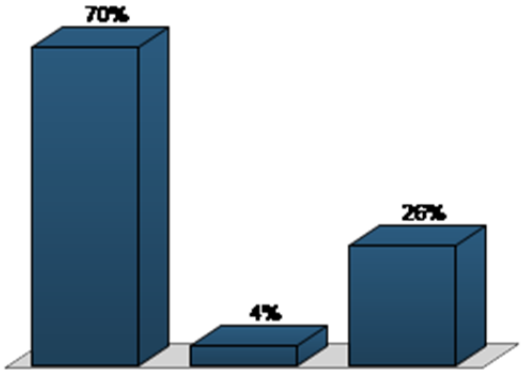
16. If Bedias Creek becomes impaired in the future, would you support an RUAA study? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	73.68%	14
No	0%	0
Need more info	26.32%	5
Totals	100%	19



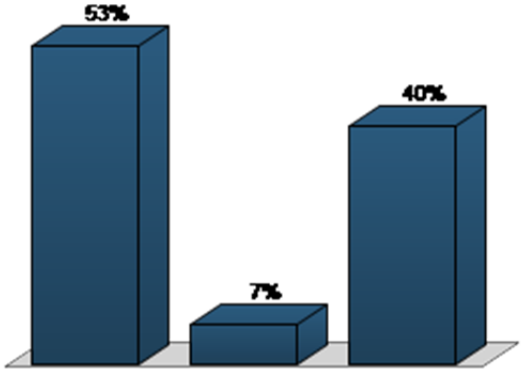
17. Would you like to have an RUAA meeting held in the Bedias Creek watershed? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	69.57%	16
No	4.35%	1
Not sure	26.09%	6
Totals	100%	23



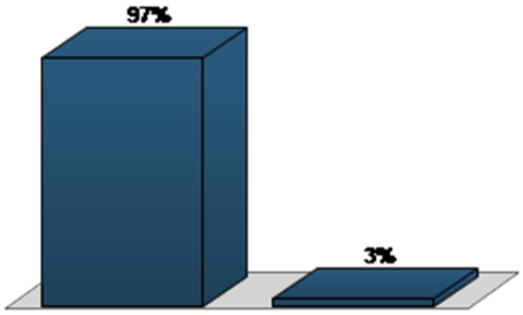
18. Would you be willing to allow those conducting RUAA onto your property to access Bedias Creek? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	53.33%	8
No	6.67%	1
Need more information	40%	6
Totals	100%	15



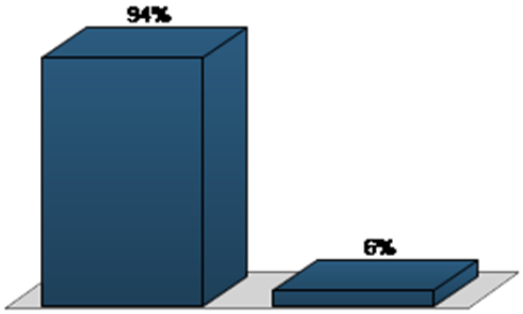
19. Do you see the need for more education on watershed management/water quality topics? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	96.55%	28
No	3.45%	1
Totals	100%	29



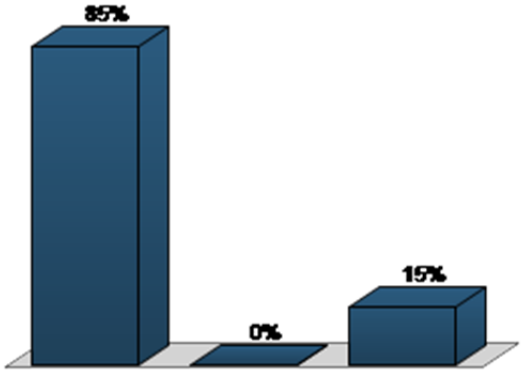
20. Did you increase your knowledge of water quality and watershed management by attending this program? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	93.75%	30
No	6.25%	2
Totals	100%	32



21. Do you want to more info on how to implement practices on your land that benefit water quality/quantity? (Multiple Choice)

	Responses	
	Percent	**Count**
Yes	84.62%	22
No	0%	0
Already adopted	15.38%	4
Totals	100%	26



22. Would you recommend Texas A&M AgriLife Extension programs to others? (Multiple Choice)

	Responses	
	Percent	**Count**
Very Likely	74.19%	23
Likely	19.35%	6
Neutral	3.23%	1
Not Very Likely	0%	0
Not Likely	3.23%	1
Totals	100%	31