External program evaluation of the Riparian Landowners’ Network 2008-2010

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Riparian Landowners’ Network External Evaluation
Executive Summary

The Riparian Landowners’ Network [Riparian Network] is a program designed and implemented by the Nueces River Authority based in Uvalde, Texas. The program seeks to build a network of landowners and decision makers in the Nueces River Basin who are knowledgeable about the importance and attributes of healthy, functioning riparian systems, and who use that knowledge to manage riparian areas. Expertise in riparian areas among natural resource professionals, and a general understanding of this information among the public and landowners, is critically lacking in the region of South West Texas. Through partnering with two federal agencies, the National Riparian Service Team and the Natural Resource Conservation Service, the Riparian Network program has begun to fill this gap in knowledge and expertise by organizing bi-annually a series of educational Riparian Workshops in areas across the Nueces River Basin.

In 2010 the Nueces River Authority contracted with researchers from Oregon State University to conduct an external evaluation of the Riparian Network program. This report presents the findings of this evaluation, and covers the first three years of Riparian Network activities from its inception in 2008 through the end of 2010. Objectives of this evaluation are to: 1) Identify immediate outcomes of the Riparian Workshops, and potential intermediate and long-term outcomes; 2) Identify effective program characteristics and areas for improvement; and 3) make recommendations for improving the overall program. Sources of information and data for this evaluation include 480 pre/post tests designed and implemented by the Nueces River Authority, sign-in sheets from twenty-nine Riparian Workshops, participant observation at three Riparian Workshops, and thirteen semi-structured interviews with past-participants and key informants. A summary of findings follows:

Program Outputs

- Between May 2008 and October 2010, thirty Riparian Workshops were held by the Nueces River Authority, with 655 total workshop participants. Twenty-six percent of participants indicated that they work for a state, federal, or county government land management agency. Thirty-six percent indicated they represent a non-governmental organization, business, ranch, or ‘self.’ The remaining 38% did not answer or provided an unclear response.

- Four thousand Nueces River Basin riparian plant guides produced by the Nueces River Authority have been handed out to workshop participants and other interested publics free of charge.

Knowledge and Awareness Outcomes: Increased awareness and appreciation of riparian areas and their attributes and processes were found to be the most significant outcomes to date of Riparian Network program activities. Additionally, Riparian Workshops substantially increased participant knowledge about riparian plants, why riparian plants are important, and the importance of large wood in streams. Increased knowledge about management practices for riparian areas included improved understanding of the impacts of brushing, mowing, and killing riparian plants, and removal of downed trees from streams. Participants use this awareness and knowledge to observe and manage their own riparian areas, particularly riparian vegetation.
**Network of riparian advocates:** Increased appreciation and awareness of riparian function has motivated many past-participants to want to continue to learn, attend or host additional workshops, and help spread the word about future Riparian Workshops. Riparian Workshops have also been successful at facilitating immediate interaction and relationship building around riparian areas. Opportunities to continue to build these relationships and mobilize newly inspired riparian advocates into an interconnected network beyond the Riparian Workshops have not emerged, however.

**Natural resource professionals use knowledge:** Natural resource agency professionals and other individuals who influence private landowner management practices use or plan on using knowledge gained from the workshops to advise landowner clients with whom they work. While agents have reported sharing information and advice with landowners, it is not clear how, if at all, their assistance has affected on-the-ground changes to landowner management.

**Landowners use knowledge:** The overall impact of knowledge and awareness outcomes on actual landowner management practices is unclear and challenging to measure. This report describes how some landowners have made changes attributable to Network participation, but findings were anecdotal and inconclusive. Changes or alterations of management practices involved ceasing to or not following through with plans to clear riparian vegetation from stream banks. Considering the young age of the program, much of the impact is expected to be felt in the coming years, and further evaluation will be required to measure this impact.

This report concludes with a series of recommendations on the following themes:

- Strengthening programmatic linkages between immediate, intermediate, and long-term outcomes
- Increasing specificity of program objectives and metrics of success
- Developing opportunities to engage riparian advocates on an ongoing basis
- Improving mechanisms for measuring performance
- Building partnerships to promote development of technical expertise in region

Barriers to continued program operation and improvements include limited staff time and availability to support the program, a limited number of riparian experts in the region available to facilitate workshops, and lack of secure funding. Chief among these barriers is the lack of a continuous, dedicated funding source. The Riparian Network program is funded entirely from grant and foundation support. While the program has many strong supporters and received numerous accolades, without continued funding the Nueces River Authority will be forced to greatly reduce, or eliminate, the Riparian Network program offerings.
Introduction

About the Riparian Landowners’ Network

The Riparian Landowners’ Network was created in 2007 by the Nueces River Authority to raise awareness and cultivate a common understanding about riparian function and the values provided by functioning riparian areas. Headquartered in Uvalde, Texas, the Nueces River Authority is a state agency mandated with managing surface water resources in the Nueces River Basin. One of three programs run by the Nueces River Authority’s Resource Protection and Education Director, the Riparian Network aims to develop a critical mass of people who will interact with each other and manage riparian resources based on shared knowledge. Riparian Workshops are the primary venue for outreach and training used by the Riparian Network, providing landowners with tools and knowledge to assist them in making better management decisions. The workshops introduce participants to riparian function and the attributes and processes that lead to Proper Functioning Condition (PFC).

The upper and middle parts of the Nueces River Basin are sparsely populated rural areas dominated by agricultural and recreational properties, with small towns dotting the landscape. The Nueces River and the thousands of miles of tributary streams supply a large part of the municipal drinking water for the downstream metropolitan city of Corpus Christi, and recharge major and minor aquifers which provide water for other urban areas such as San Antonio. Enhancing and maintaining riparian system functions in the upper and middle parts of the Basin is seen as important both at the local level for the ecological, recreational, and wildlife values supported by riparian areas; and at the landscape scale to ensure a continued water supply for some of Texas’ largest urban populations.

Approximately Ninety-seven percent of the land in Texas is privately owned, and for the most part, maintenance and restoration of riparian systems is voluntary. Coordination across multiple landownership types and boundaries, therefore, poses a difficult challenge for public agencies and groups interested in enhancing the health of river systems, particularly in the face of increasing drought, land use changes, and a growing uninformed population. Identifying strategies to enhance the functioning of hydrologic systems across multiple boundaries, therefore, is essential. The Riparian Landowners’ Network is a response to these threats, tailored to address the specific needs and situations faced by riparian landowners in the region.

Since May 2008 the Nueces River Authority has held 30 Riparian Workshops. Workshops are offered free of charge every May and October, and are held in a variety of locations across the Nueces River Basin, mostly in the upper half of the Basin. Local landowners (typically past workshop participants) volunteer to host the workshops on their property and in their homes. Workshops are one full day in length, with the first half is held indoors, often in a living room or hunting cabin, and the second half held in the field on various creek side locations on landowner hosts’ properties. Nueces River Authority staff report that 655 people have attended Riparian Workshops since 2008.
Twenty-six percent of participants indicated on the workshop sign in that they represented a state, federal, or (less frequently) county government land management agency. Nine percent were with a non-governmental organization, business, or camp. Twenty-seven percent of past-participants wrote in the name of a ranch or ‘self’ in response to who they were representing. The remaining 38% either left the “representing” column blank, or wrote a response that was illegible or unclear. The majority of participants lived, worked, or owned property in the Nueces River Basin. A number of participants also traveled to the workshops from areas outside the Basin. Though the exact numbers are unknown, workshop trainers indicated that they thought the proportion of participants from outside the Basin was increasing each year.

Sky Jones-Lewey, the Nueces River Authority’s Resource Protection and Education Director, is the lead organizer for all facets of the Riparian Network and workshops. Workshop trainers join Sky twice a year and lead the technical training elements. Up until the October 2010 workshops, the National Riparian Service Team (NRST) also assisted with the workshops, providing one trainer. (The NRST is a federal inter-agency team composed of Bureau of Land Management and US Forest Service riparian experts, and aided the Nueces River Authority with designing their Riparian Workshops.) The one-day Riparian Workshop curriculum is based on a two-day curriculum used by the NRST to teach resource professionals how to perform a Proper Functioning Conditioning of riparian areas assessment. Currently the technical trainers are members of the Texas Riparian Team, which is comprised of employees of the National Resource Conservation Service (NRCS).

While the Riparian Workshops are currently the central focus of the Riparian Network program activities, other resources and opportunities are also supported by this program. In 2008 the Nueces River Authority created and published a plant guide featuring riparian plants found in the Nueces River Basin. The guide includes color photographs, illustrations, and detailed information on how the featured plants improve (or detract from) riparian function and processes. Guides are handed out to all workshop participants or people who have expressed interest, and are free of charge. Due to popularity of the guides, an additional 1,000 were printed in 2010. Of the 4,000 guides published, only a few remain. Program activities in the past have also included on-site consultations for past-participant landowners, during which workshop trainers visit a landowner’s property and walk the riparian area with him or her, providing feedback on how well the area is functioning as well as opportunities for improving management practices.

Table 1: Workshop Participant Affiliation (sum of 29 workshops)¹

<table>
<thead>
<tr>
<th>Affiliation</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency</td>
<td>154</td>
</tr>
<tr>
<td>Group/Camp/Business</td>
<td>57</td>
</tr>
<tr>
<td>No Answer</td>
<td>167</td>
</tr>
<tr>
<td>Ranch/Self</td>
<td>161</td>
</tr>
<tr>
<td>Unclear</td>
<td>62</td>
</tr>
<tr>
<td>Total</td>
<td>601</td>
</tr>
</tbody>
</table>

1 Totals represent the total number of individuals from the sign in sheets analyzed by the OSU team. These numbers differ slightly than the Nueces River Authority tally’s as all sign in sheets were not available at the time of this analysis. A small number of people attend and do not sign in. Individuals who have attended a workshop more than once are included in the totals and percentages reported above. 30 individuals reported being repeat attendees on the pre/post test (it is not part of the sign-in sheet). However, reporting of repeat attendance data is inaccurate and is thought to be higher than reported, as collection of this information has been inconsistent.
**Evaluation Purpose**

The research team for this evaluation is based out of Oregon State University and includes Dr. Hannah Gosnell, Assistant Professor of Geography, and Jill Smedstad, a graduate research assistant. In 2010 the Nueces River Authority contracted with the OSU team to evaluate the outcomes of the Riparian Landowners’ Network program and to provide recommendations for improvements. Information gained from this evaluation will be used to guide future program improvements and report outcomes to past and future funders. Previous program reports compiled by the Nueces River Authority have focused on program outputs (e.g. number of participants or workshops held); this evaluation will be the first external evaluation of program outcomes. The evaluation aims to address the following three objectives:

1. To identify the immediate outcomes of the Riparian Workshops, and examine potential intermediate and long-term outcomes of the Riparian Network program
2. To identify program characteristics effective at achieving desired outcomes, and areas for improvement
3. Suggest recommendations for improving the overall program

The Riparian Network program is designed around a program theory of change which posits that increased knowledge and awareness of riparian function will influence landowners to alter their riparian management practices. Altered management practices will then result in improved ecological conditions and an upward trend of riparian function in the Nueces River Basin, which is the long-term goal of the Riparian Network. Central to this theory of change are two important assumptions: 1) that increased knowledge and awareness will lead to behavior change; and 2) that behavior change will lead to an improved ecological condition. The first of these assumptions is the focus of this evaluation. To evaluate on-the-ground improvements of ecological conditions after three years of program implementation would be premature and infeasible given the resources available for this evaluation.

In order to provide a basic framework to guide the evaluation, we developed a program logic model (see Appendix A). The logic model, commonly used in program evaluation, is used here as a tool to graphically demonstrate how program inputs and outputs are intended to lead to desired outcomes. Drawn mostly from Riparian Landowner Network literature, grant proposals, and discussions with staff members and trainers, the logic model was reviewed by an NRA staff member before being finalized. The desired outcomes from the logic model were then used as the primary framework for coding interview transcripts and field observations.

In this report, immediate and intermediate desired outcomes from the logic model are grouped into four broad program objectives. We found that, because there was significant overlap in the coded data among desired outcomes, grouping the outcomes under four related objectives greatly aided data analysis and the reporting of findings. The four objectives are: 1) Increased participant knowledge, 2) Increased participant awareness and appreciation of riparian areas, 3) Expanded network of riparian advocates, and 4) Increased participant use of knowledge. Each objective includes one to three of the desired outcomes found in the program logic model. Also included in the findings section is a description of other unintended outcomes resulting from the Riparian Network program.
The remainder of the report is organized into three sections. First, we discuss the methodology used to gather and analyze the data used in this evaluation. The findings section follows, which is organized according to the four program objectives. For each objective in the findings section we summarize evidence of outcomes, describe effective program characteristics, and identify opportunities for improvement. The final section includes a discussion of our findings, limitations of the evaluation, and overall recommendations for program improvement.

Methodology

Our research methodology, which includes semi-structured interviews, participant observation, and pre/post test analysis, was developed in close consultation with Nueces River Authority staff in the development stages of this evaluation. Utilizing these three different research methods allowed us to “triangulate” our findings from one method by cross-checking them with findings from the other methods (Berg 2004). Jill Smedstad, the graduate research assistant on this project, carried out the field work for this evaluation. In May 2010 she spent five days in the field traveling with the workshop trainers, conducting semi-structured interviews with past-participants and workshop trainers, and attending three Riparian Workshops.

1. Qualitative Interviews

Qualitative interview methods were chosen in order to generate insights into the range of outcomes of the Riparian Network, and to gain an understanding of perceptions of program effectiveness. Convenience and purposive sampling methods were used to select interviewees. The majority of past-participant interviewees volunteered to participate in an interview by responding to an email that was sent out by the Nueces River Authority to all past workshop participants. All workshop trainers were interviewed.

Due to the nature of the sampling procedure used, findings from interviews cannot be generalized to the larger population. Rather, these findings provide a “thick description” of the program (Patton 2002). Because the Riparian Network is a relatively young program, intermediate and long-term outcomes, in many cases, are yet to be realized. This thick description, therefore, sheds light on potential on-the-ground outcomes (or lack thereof), and perceptions of effectiveness, both of which would be more challenging to discern with quantitative methods.

Thirteen semi-structured interviews were conducted; eight with past workshop participants, and five with Riparian Workshop trainers. Three of the past-participant interviews were conducted with husband and wife landowner couples, so 11 total past-participants were interviewed. Six past-participant interviewees had attended more than one Riparian Workshop. Of the eight interviews, two were with employees of a state or federal government natural resource agency, five were with private landowners, and one was with a manager/employee of a business operated on private land. Two past-participant interviewees also have professional interest in the Riparian Network, serving as board members of either the Nueces River Authority or a funding organization of the Nueces River Authority. To protect interviewee confidentiality, names have been replaced with numbers in this report.
The guide used to interview past-participants can be found in Appendix B. The interviewer used prompts as necessary to encourage the interviewee to elaborate more on a relevant topic, and the semi-structured interview questions were modified slightly for workshop trainers. Interviews were audio recorded, then transcribed and coded using NVivo qualitative software. The coding strategy utilized both predetermined and emergent codes, which helped to organize information by relevant topics and explore patterns in the interviews (Berg 2004, Patton 2002). Predetermined codes were drawn from the logic model and interview guide.

2. Participant Observation

Participant observation field work was conducted by the graduate research assistant during three consecutive Riparian Workshops. Observations and informal conversations with participants and trainers provided information on effectiveness of activities and immediate outcomes of the workshops and provided a context for understanding program activities and outputs (e.g. number of participants, participant affiliation, workshop agenda, and field activities). Extensive notes were taken during this field work, and were also coded in NVivo to cross-check interview and pre/post test findings.

3. Pre/Post Test Analysis

Analysis of data from pre/post-tests was the third method used and provided both quantitative and additional qualitative evidence of immediate outcomes. The Nueces River Authority implemented a pre/post-test intended to gauge changes in participant knowledge and attitudes at all but three of the workshops held since 2008. The pre/post-test questions and format were developed by Nueces River Authority staff in consultation with National Riparian Service Team members. Workshop participants were given a blank answer sheet at the beginning of the workshop, and were asked to answer nine questions shown on series of slides. (See Appendix C for the test slides and answer sheet.) At the end of the classroom portion of the workshop, prior to lunch and the field portion, participants were then asked to answer the same questions again, in a different column on the same answer sheet. Changes in responses from the pre-test to the post-test, for each participant, were then identified. In total, 480 pre/post-tests from 27 different workshops were analyzed.

Of the nine questions on the pre/post-test, results from eight questions were analyzed as quantitative data. The approach used to analyze this data was developed with the assistance of a consultant from OSU’s Statistics Department. Answers to the quantitative data were scored as either correct or incorrect. Correct answers were given a score of “1” and incorrect answers were given a “0.” Scores were then entered into a database by workshop date. Responses to individual questions with illegible or blank test responses were entered as ‘NA’ and these responses were not included in the analysis. A number of different factors could lead a test respondent to leave an answer blank, which is why these responses were excluded. For example, a participant could have arrived late and missed the first slides, a slide could have changed before they had time to answer the question, or they may not have known the answer and chose not to respond.

After data was scored and entered, it was then treated as paired binomial data. For individual questions, the combined pre-test and post-test score resulted in one of four possible score types (see
Figure 1). The number of participants with each score type (A, B, C, or D) was then totaled. For each score type, the total number of participants with that score was divided by the total number of valid responses (responses with a legible response to both the pre- and post-test) to get the percentage of participants with each score type. In order to understand changes in response from pre-test to post-test, of those that answered each question incorrectly on the pre-test, we calculated the percent that answered correctly on the post-test (D/C+D).

Inference of pre/post test findings to the larger population of riparian landowners and agency personnel cannot be made because workshop attendance was voluntary. Additionally, the workshops likely attract individuals already interested in rivers and streams. In most cases, because the test was administered both immediately before and immediately after the classroom portion of the workshop, one can infer that changes in response were caused by the workshop. However, a number of the questions have multiple interpretations, which may influence the validity of findings from this data. Potential validity problems for each of the nine questions are discussed further in Appendix D.

Question 6 in the pre/post test was not scored or included in the quantitative analysis because of the descriptive nature of the question. The question asked test respondents to describe the differences they saw between two pictures of riparian areas shown on a slide. Instead of a quantitative analysis, a randomly selected subset of responses to this question was analyzed for qualitative changes in language used by respondents from the pre-test and the post-test. Because of the open-ended nature of this question, changes from pre- to post-test is not used here as evidence of change in participant knowledge. Rather, changes in the type of language used and riparian features described is used to provide further qualitative evidence of changes in participant awareness of riparian area features and processes.

4. **Sign-in Count and Affiliation**

In addition to the above research methods, sign-in sheets for each workshop were used to verify outputs related to the number of workshop attendees and their affiliation. Affiliation was determined from responses to the “representing” column on the sign-in sheet.

**Findings**

1. **Increased Knowledge**

*Desired Outcomes: Participants gain an increased knowledge of proper functioning condition and skills for enhancing riparian function.*

The most frequently identified areas of immediate knowledge gain reported by participants in interviews and during the workshops were 1) types of riparian plants and why they are important, and 2) the importance of large wood in streams. Participants also reported learning about practices that adversely impact riparian function; specifically, the impacts of brushing, mowing, and killing riparian plants; and removal of downed trees from streams.
Table 2: Areas of knowledge gain and learning identified by past-participants
(Items in bold reported most frequently)

<table>
<thead>
<tr>
<th>Category</th>
<th>Knowledge Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vegetation</strong></td>
<td>• Identification of riparian area plants</td>
</tr>
<tr>
<td></td>
<td>• Why diversity of riparian plants is important</td>
</tr>
<tr>
<td></td>
<td>• The stabilizing impact of plant roots</td>
</tr>
<tr>
<td></td>
<td>• Riparian plant communities are different from uplands</td>
</tr>
<tr>
<td></td>
<td>• Why drought is good for the river</td>
</tr>
<tr>
<td><strong>Hydrology</strong></td>
<td>• Stream channels change over time</td>
</tr>
<tr>
<td></td>
<td>• It is not the nature of streams to run straight</td>
</tr>
<tr>
<td></td>
<td>• Anything on the ground eventually winds up in the river</td>
</tr>
<tr>
<td></td>
<td>• Difference between intermittent and perennial streams; they can change</td>
</tr>
<tr>
<td><strong>Sediment &amp; Deposition</strong></td>
<td>• Why large wood in the riparian area is important</td>
</tr>
<tr>
<td></td>
<td>• What the riparian “sponge” is, and how it works</td>
</tr>
<tr>
<td></td>
<td>• The impact of the speed of water on riparian area; the need to slow it down</td>
</tr>
<tr>
<td></td>
<td>• Riparian plants catch sediment</td>
</tr>
<tr>
<td><strong>Knowledge of how management practices impact riparian function</strong></td>
<td>• The impact mowing and clearing brush from the riparian area has on streams</td>
</tr>
<tr>
<td></td>
<td>• Clearing small entry points to the stream is ok, but you shouldn’t clear large swaths</td>
</tr>
<tr>
<td></td>
<td>• The impact of removing large wood from streams</td>
</tr>
<tr>
<td></td>
<td>• How management of uplands vegetation (grazing and clearing cedar) impacts stream function</td>
</tr>
<tr>
<td></td>
<td>• That how you manage riparian areas should potentially be different than the uplands</td>
</tr>
<tr>
<td></td>
<td>• The role of livestock in causing riparian area damage</td>
</tr>
<tr>
<td></td>
<td>• If you kill or remove existing vegetation, something worse might take its place</td>
</tr>
<tr>
<td></td>
<td>• Detrimental impact of axis deer on riparian areas</td>
</tr>
<tr>
<td></td>
<td>• The impact of dams on sediment transport</td>
</tr>
<tr>
<td></td>
<td>• <strong>Benign neglect</strong>; the stream will heal itself, drastic alterations are not necessary</td>
</tr>
<tr>
<td><strong>General learning</strong></td>
<td>• Intuitively knew things in back of the mind, but learned why in workshop</td>
</tr>
<tr>
<td></td>
<td>• General statements of “I learned a lot”</td>
</tr>
<tr>
<td></td>
<td>• How to read a creek; how to tell if it is in good or bad function, and identify why</td>
</tr>
<tr>
<td></td>
<td>• Every time I go I learn something different, new</td>
</tr>
<tr>
<td></td>
<td>• How to put it all together (takes a few times)</td>
</tr>
</tbody>
</table>
A reoccurring take home message reported by participants was an increased understanding of, as past-participant # 8 put it, the value of “benign neglect” of riparian areas. Participants learned about how creeks repair themselves; refuting the commonly held notion that ‘tidying’ or ‘cleaning up’ of streams actually helps improve the stream. All past-participant interviewees cited this as a key piece of new knowledge, and this was echoed by participants in the field during the site visit. See Table 2 for a list of specific areas of knowledge gain reported by interviewees and participants in the field.

The pre/post-test question with the greatest percentage of participants reporting learning something new was Question 2, which had to do with the fact that sediment transport and deposition processes are the primary ways in which floods benefit riparian areas. Forty-nine percent of respondents answered this question incorrectly in the pre-test and correctly in the post-test, demonstrating a lack of existing knowledge in this area. Thirty-nine percent of the respondents knew the correct answer before the workshop, and 9% answered it incorrectly on both tests. Of those that answered this question incorrectly in the pre-test, 85% answered it correctly on the post-test.

Test respondents also showed a relatively high percent in change from pre- to post-test in their interpretation of management changes necessary for improving a riparian site. Twenty-eight percent of test respondents initially chose one of the three incorrect responses to the question “If this was your riparian site what would you do?” and changed it to the correct response “change grazing management” in the post-test. Eight percent of respondents chose the incorrect answer in both tests, demonstrating a lack of understanding of the primacy of grazing management in the situation presented. Of those that answered this question incorrectly in the pre-test, 77% answered it correctly in the post test.
**Effective Strategies and Opportunities for Improvement**

Overall, participants thought very highly of the trainers’ abilities to communicate technical information to other natural resource professionals and laymen alike. The training strategies used were considered quite effective, however some participants expressed disappointment in the lack of content included in the curriculum regarding what landowners can do to improve their riparian areas. Additionally, two participants would have liked more information on grazing management.

Figure 2 highlights strategies that were perceived as effective at increasing participant knowledge, or that could be improved:

<table>
<thead>
<tr>
<th>Effective strategies</th>
<th>Opportunities for improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content was tailored to SW Texas audience of landowners and agency personnel</td>
<td>Many would like to hear more about how to change management, how to fix degraded areas &amp; how management changes might impact people financially</td>
</tr>
<tr>
<td>Vegetation content was easy for participants to connect to</td>
<td>Hydrology section lots of information, could be more focused</td>
</tr>
<tr>
<td>Slides of chronological changes, before and after photos effectively demonstrate content and examples of how management practices have been put to use</td>
<td>Hard at first to get past the fact a lot of the pictures weren’t from Texas, or their specific region, river type. Understood concepts, but hard to apply to own area.</td>
</tr>
<tr>
<td>Referencing the PFC checklist helped some follow along between the different sections</td>
<td>Inconsistently referencing checklist; some trainers, sections referenced it more than others</td>
</tr>
<tr>
<td>Classroom portion effective set-up for field; field was a good demonstration of content</td>
<td>Classroom portion went too long; got restless after a while. Not enough time left for questions.</td>
</tr>
<tr>
<td>Field visit helped participants get a feel for identifying riparian plants</td>
<td>Trainers don’t always get to vet field sites; sites may not always be effective demonstrations of classroom content.</td>
</tr>
<tr>
<td>Field portion allows participants to synthesize the different pieces and gain a better understanding of how the concepts work together</td>
<td>Typically only visit one or two singular sites; need to visit entire reach in order to assess function</td>
</tr>
<tr>
<td>Interacting with trainers and other resource professionals in the field helped participants ask specific questions and collectively discuss how to interpret a site</td>
<td>People socialize a lot during field portion; hard for trainers to keep attention of large group in the field</td>
</tr>
</tbody>
</table>

**Figure 2: Effective Strategies and Areas for Improving Knowledge Gain Outcomes**
2. Increased Awareness and Appreciation

Desired Outcomes: Awareness of riparian areas and the values supported by riparian function increases. Participant appreciation for natural disturbances and aesthetics of healthy riparian areas improves.

Seven past-participant interviewees and four trainer interviewees cited raised awareness of riparian areas as a main outcome of the workshops. Conversations with participants at the May 2010 workshops confirmed this, where a number of people mentioned that the workshop changed their thinking about riparian areas. According to past-participant #3: “the workshops create raised awareness, that’s what it’s all about.” Past-participant #9, when asked about what kind of ‘aha’ moments they had as a result of the workshops, responded: “The first one was really such an [increased] awareness, it was so much on an awareness level I couldn’t soak in anything really.” This respondent continued, suggesting that this awareness then allowed her to retain more specific knowledge about riparian areas after attending a second workshop. The area of awareness gain that was most frequently reported was a change in the way participants think about and see riparian areas; specifically awareness of the general importance and existence of riparian areas.

Participants reported that the Riparian Workshops helped overcome commonly held myths or misconceptions about creeks and rivers. Specifically, participants became aware that popular ideas of what a ‘beautiful’ creek looks like (straight, clear, unobstructed, free flowing, cleared brush, or park-like) is generally counter to attributes of a properly functioning stream. For example, past-participant #1 stated, “Things we thought on the river that weren’t good were the plants coming up through the gravel, the sycamore trees, we thought were ugly. Which is rehabilitating.” And according to past-participant #5, “When a tree falls into the creek, my first reaction was always ‘get it out of there, it’s ugly.’ When actually it’s beneficial.” A number of other past-participant interviewees noted, in addition, that the workshop(s) raised awareness of mistakes they made in the past management of their riparian areas.

Open-ended responses to Question 6 on the pre/post test (“What differences do you see between these two riparian areas?”) shed additional light on changes in participant awareness of riparian area attributes. A review of difference in responses to this question between the pre-test and post-test reveals that as a result of the Riparian Workshop it is not uncommon for participants to: 1) increase or change the type and number of factors they consider when describing or comparing riparian areas, and/or 2) interpret the meanings of stream characteristics differently. As stated earlier the frequency and type of changes in responses to this question were not quantified. Of those that had a change in response, responses in the post-test demonstrate increased awareness of the significance of riparian vegetation, the presence of large wood, and the channelization of streams. See Figure 3 for a selection of responses to this question.
**FIGURE 3: A selection of pre/post responses to question 6 that demonstrate change from pre to post**

*Question 6: What difference do you see between these two riparian areas?*

<table>
<thead>
<tr>
<th>Right</th>
<th>Pre test</th>
<th>Post test</th>
<th>Left</th>
<th>Pre test</th>
<th>Post test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riparian vegetation cover</td>
<td>Vegetation stabilizing bank</td>
<td>Water depth and speed movement</td>
<td>Wood in water catching sediment and veg.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A good and healthy riparian system</td>
<td>Riparian system with too much sediment and few riparian vegetation</td>
<td>Unhealthy with dead tree stop the flow through the system</td>
<td>A good riparian system with fallen tree to dissipate energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not heavily vegetated, rocky water moving fast</td>
<td>Not enough vegetation for healthy riparian area, water moving fast</td>
<td>Heavily vegetated, deeper water</td>
<td>Nice vegetation for slower water movement and erosion control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposed bank/gravel bed</td>
<td>Straight, minimal vegetation, no wood</td>
<td>More vegetation, more debris, more water seems deeper</td>
<td>Veg. still seems limited and not very diverse here.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is less fine soil material, water looks cleaner</td>
<td>Straighter</td>
<td>More herbaceous</td>
<td>Greater amount of stability, vegetation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cobble, flowing</td>
<td>Recently scoured or overgrazed</td>
<td>Aquatic macrophytes, not flowing</td>
<td>Healthy vegetated growth with stable banks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposed gravel, absence of sig. vegetation, straight homogenous</td>
<td>Straight, wide, shallow, bare</td>
<td>Natural debris, well vegetated bank</td>
<td>Meandering, lg. wood, deep, well vegetated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right bank looks bare, open failing bank</td>
<td>Has few species diversity, low stability rating plants</td>
<td>Looks undisturbed with log jams, etc. Clear water slower flowing</td>
<td>High diversity, different age groups of plants, log jams, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free flowing</td>
<td>No growth of plants that help control erosion</td>
<td>Not free flowing</td>
<td>Has additional growth and debris to help maintain a stable stream</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Streambed, no vegetation, drivable</td>
<td>Erosion, no vegetation, no small trees/grass</td>
<td>Cove, more vegetation, not drivable</td>
<td>Large trees in place, more vegetation, less erosion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean-flow</td>
<td>Little foliage</td>
<td>Messy, disturbs flow of stream</td>
<td>shrubs, logs for riparian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear water, straighter, no blocking debris</td>
<td>Low vegetation, straight</td>
<td>Stagnant sides, brush, debris clogging flow</td>
<td>Woody stabilization, crooked, abundant veg.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean river, free flowing with plants on side</td>
<td>Plants beginning on right side along edge</td>
<td>Debris, limbs, etc. slowing flow with growth of grass, weeds in sluggish water</td>
<td>Trees et slowing silt deposit and beginning growth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleared area, healthy water</td>
<td>Needs repair, structure</td>
<td>Brush</td>
<td>Log structure</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Question 9 on the pre/post-test explores if participants’ attitudes toward features of properly functioning riparian areas improves as a result of the workshop. In this question, participants are asked which side of the creek they would prefer to own when shown a picture. One side of the creek in the picture is cleared and mowed down right to the creek, and the other side is brushy and not mowed. Seventy-six percent of test respondents that said they would prefer to own the cleared side in the pre-test changed their response in the post-test to say they would prefer the uncleared (healthier) side. Of the 21 respondents who preferred the cleared side in both the pre- and post-test, two individuals added a note that they understood that the un-cleared side was healthier, but still prefer the cleared side because it looked better or was more accessible.

Table 4: Question 9 Pre/Post Test Results Summary

<table>
<thead>
<tr>
<th></th>
<th>Total Valid Pre &amp; Post responses</th>
<th>Correct, Incorrect A (1,0)</th>
<th>Correct, Incorrect B (1,1)</th>
<th>Incorrect, Incorrect C (0,0)</th>
<th>Incorrect, Incorrect D (0,1)</th>
</tr>
</thead>
<tbody>
<tr>
<td># responses</td>
<td>428</td>
<td>3</td>
<td>326</td>
<td>21</td>
<td>68</td>
</tr>
<tr>
<td>Percent of valid responses</td>
<td>0.7</td>
<td>76.17</td>
<td>4.91</td>
<td>15.89</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Different response on post test than pre test</th>
<th>Incorrect response on pre test</th>
<th>Of those that changed their response from pre to post, the % that changed from correct to incorrect</th>
<th>Of those that answered incorrectly on the pre-test, the percent that answered correctly on the post test</th>
</tr>
</thead>
<tbody>
<tr>
<td># responses</td>
<td>A+D</td>
<td>C+D</td>
<td>D/A+D</td>
<td>D/C+D</td>
</tr>
<tr>
<td>Percent of valid responses</td>
<td>16.59</td>
<td>20.79</td>
<td>95.77</td>
<td>76.4</td>
</tr>
</tbody>
</table>

Effective Strategies and Opportunities for Improvement

All past-participant interviewees noted that the use of chronological before and after photos was a very effective demonstration of the impact of riparian management principles and the effects of riparian management practices being put to use. Although the most illustrative photos were from regions outside of Texas, participants found these photos effective at demonstrating the concepts covered in the curriculum. Because the pictures were not reflective of the conditions in their own area, however, it was challenging for participants to connect personally to the information presented. Pictures in the slide shows of creeks similar to participants’ own area would likely improve interest and alertness during the workshop, and provide better guidance for applying new knowledge to their own creeks and streams. Past-participant #3 told of a conversation she had with another person at a workshop: “One of the ladies was telling me that once they started showing pictures she said ‘Oh, that looks like our ranch,’ and she said that’s when she started to perk up.” To their credit, network trainers and facilitators are constantly updating the pictures they use as slides, trying to incorporate visuals that reflect their service areas. Unfortunately there is a lack of highly demonstrative before and after photos from regions in Texas, and the best illustrations are still from areas in other states.
and trainers alike cited this lack of illustrative photos from the area as a challenge to the ability of participants to connect to the information and stay alert.

An important element of the workshop that helps participants personally connect this new information to their own area is the second half of the day, the field portion. As past-participant #2 stated, “Coming out in the field really addressed our specific area. In the classroom they addressed rivers in general, but to take us into the field they really were able to focus on our area.” Participants that do not attend the field portion may miss an important component of the workshops. During the site visit it was observed that approximately one quarter of the participants left after the classroom components and did not attend the field portion. Since the trainers cannot prevent people from leaving early, this situation reinforces the need for more high quality photos of regional examples in the classroom portion.

3. Expanded Network of Riparian Advocates

Desired Outcomes: Participants meet and interact with other neighbors, community members, and professionals interested in riparian areas and streams. Participants continue to build and share awareness of riparian function, interact with other network members, and cultivate advocacy for managing for healthy riparian areas.

The Nueces River Authority has had more than 650 people participate in 30 different workshops over the course of three years. While this is only a small fraction of the population of the Nueces River Authority service area, it nevertheless attests to recruitment and outreach effort that are highly effective at bringing people together to learn about riparian areas. Of the 602 participants that signed in to the workshops, 30 participants noted on their pre/post test that they were return attendees. The actual number is likely much higher, however, because the process for collecting this information was inconsistent. Another indicator that the occurrence of repeat attendance is higher than documented is that the graduate research assistant interviewed or met at least 15 different return attendees during just the three days of workshops she attended in May 2010.

Participant observation at the Riparian Workshops revealed that the workshop agenda facilitated interaction among participants, encouraging them to build relationships, to visit with neighbors and other people with an interest in creeks, and to learn from each other in the field. Two past-participant interviewees noted that the opportunity to socialize during the breaks and field portion was a good way to get advice and compare issues with other landowners and agency personnel. Observations in the field confirmed that side conversations among participants frequently revolved around the topic of creeks and streams, and a number of people met neighbors along their creek that they had not met before, or had not seen in a long time. For example, at one of the workshops, three retired women who lived along different sections of an area stream all met for the first time. By the end of the field portion of the workshop they had two tentative arrangements to meet again in the future (two of them to identify riparian plants together).

Word-of-mouth is the biggest recruitment tool used by the Nueces River Authority to draw people to the Riparian Workshops, which serves as evidence of an expanding network of advocates. All past-
participant interviewees said that they had recommended the Riparian Workshops to other people who they thought would be interested or benefit from the information, or would in the future. Sky Jones-Lewey maintains a large email list-serv of past-participants who all receive announcements for upcoming workshops. While Sky still does much of the recruiting herself, workshop hosts and other past-participants now help spread the word too. A few individuals attending the workshops noted they heard about the workshop through the local newspaper. A large proportion, however, had been forwarded the invitation email from someone they knew.

One past-participant interviewee who works for a land management agency is a prime example of a ‘riparian advocate’ that has been cultivated through the Riparian Landowners’ Network. This interviewee has been to three Riparian Workshops and helped recruit for the second two workshops. On the topic of how to recruit local landowners, this interviewee noted: “Sometimes it takes a couple of invites. I know a couple of the ladies, I sent it [the workshop invitation] to their sons, and then their sons sent it to them, then the [workshop hosts] go to church with them and invited them [too].” This interviewee has gone to great lengths to involve as many people as possible in the riparian network, and regularly shares with both landowner clients and colleagues what he has learned from the Riparian Workshops. While riparian advocates as actively engaged as this interviewee are relatively few, their numbers are increasing across the Basin with each new workshop.

Opportunities for ongoing participant involvement with the Riparian Network include assisting with recruitment for future workshops or volunteering to host workshops. While natural resource agency personnel appear to use their new knowledge in a professional setting, little evidence was found of past-participant landowners interacting with each other to use or build on their shared knowledge outside of the Riparian Workshop setting.

**Effective Strategies and Opportunities for Improvement**

Many of the strategies and program elements that are effective at expanding the network of riparian advocates are also techniques that are effective at recruiting workshop participants. It was noted by participants and trainers alike that one of the biggest draws to the Riparian Workshops is the chance to visit a ranch or area they may have never been to before. According to past-participant #9: “There’s nothing a rancher would rather do than see someone else’s ranch that they haven’t seen.” Having landowners host the workshops also helps reduce the stigma that is often associated with agency-sponsored events, and it increases the Nueces River Authority’s ability to draw a diverse population of landowners. This practice also encourages hosts to help recruit and extend personal invitations to their neighbors and other landowners in the area, building on the ability to network landowners together on a sub-watershed scale. A number of workshop hosts are already well networked into their local community. These hosts have been able to recruit from their existing networks and pin-point key opinion leaders in the community that they think would benefit from attending the workshop.

A number of program elements help facilitate interaction and relationship building during the workshop. Coffee breaks and a long lunch break were well utilized by participants to network and visit with neighbors and other participants. The field portion of the workshop also provided numerous opportunities for participants to socialize and compare notes with each other on how the workshop
material applies to their own land. Past-participant #11 noted that taking a group photo at the end of each workshop is a small action that helped participants feel like part of a community. Keeping the classroom portion of the workshop running on schedule would help maximize opportunities for interaction among participants. When the classroom section runs over-time, this cuts away from time allotted for lunch and the field portion of the workshop. According to past-participant #10: “To get more landowners to come, and come again, it would be better to shorten the presentation a bit and lengthen the land visiting. That’s what draws people here.”

During the workshop introduction and closure, trainers emphasize that it is through working together (not through a government program or policy) that the health of the creeks and streams can be improved or maintained. This approach appears to be effective at encouraging landowner receptivity to the workshop material and the need for a riparian network. According to trainer #4, the fact that the workshop is not promoting any specific policy or program is an effective way to help reinforce this idea. The trainers also emphasize that the purpose of the workshop is not to tell landowners what to do with their land; rather it is to provide an opportunity to learn about how creeks and streams work. Three of the trainers mentioned that they felt this message was important to workshop success at garnering support from landowners, and that it has been well received. Two past-participant interviewees, however, while appreciative of this message, expressed frustration that they did not receive more explicit advice on things they can do on their property to help support riparian function.

The regularity of Riparian Workshop offerings and consistent communication with network members are both effective at maintaining past-participant awareness of riparian areas and helping spread the word about workshop opportunities. Offering sets of workshops every May and October for three consecutive years increases people’s ability to attend a workshop, encourages repeat attendance, and provides an opportunity for past-participants to spread the word and encourage others to attend. The Riparian Network utilizes a large email list-serve, over which announcements for upcoming workshops are sent. “Riparian Notes,” a series of 25 short essays written by Steve Nelle of the NRCS about different aspects of riparian function, are also occasionally sent out to people on the network list-serve and are available on the Nueces River Authority website. These notes were mentioned by one past-participant interviewee as a good method to keep people thinking about riparian areas long after the workshop is finished.

Sky Jones-Lewey was cited by all interviewees as the key to the Riparian Network’s ability to expand the network of riparian advocates. Sky has been able to use her existing personal and professional networks to effectively garner local involvement and support for the riparian network. The network strategies utilized by the program are largely due to Sky’s knowledge of the needs and culture of area landowners, and her passion for spreading the message about riparian areas. Additionally, Sky is seen as an invaluable resource for Network members in the Nueces Basin. Interviewees noted that if they have a question about riparian areas, they know they can call Sky and she will try to connect them with someone who can help.
4. Participants Use Knowledge

Desired Outcomes: Participants use knowledge and awareness to observe and monitor riparian function of streams in own area. Landowners alter management practices to improve riparian function of own area (change and/or cease). Agents and other influencers use new knowledge and skills to influence changes in landowner/client management practices.

Participants Observe Own Riparian Areas:

For most past-participant interviewees, increased knowledge and awareness of riparian function in general has translated into an increased awareness and observation of riparian conditions in streams in their own area. Past-participant #6 noted that, although he did not make any management changes as a result of the workshop, his awareness of riparian processes improved. Now, when he sees something happening on the ground, he “knows that it’s supposed to be happening.” Riparian vegetation and changes to vegetation over time are the most common riparian features past-participants observe, particularly re-vegetation of gravel bars. Some also noted observing the impacts of floods and drought to vegetation. According to trainer #1:

I’ve just been amazed about the people wanting to know their plants. They’ve taken Sky’s book and they’ve really learned the plants. And they’re telling us ‘Oh look, the plants caught the sediment, look at that.’ So, I know they’re getting it. Even though it might not be perfect, I know they’re getting the concepts and learning them and applying them to their own places.

A different workshop trainer also shared that a number of past-participants will correspond with him after the workshops, emailing with follow-up questions or asking if the trainer could come out and look at their creek with them. A couple of past-participants also have emailed with this trainer to share photos and observations they have made on their stream. Demand for follow-up discussions or visits, according to this trainer, is mostly from newer landowners to the area, rather than from more traditional agricultural-based landowners.

Landowners Alter Management Practices:

Evidence of if and how landowners alter their management practices to support riparian function is inconclusive. Of the past-participant landowner interviewees (3 couples, 3 individuals), two had altered existing plans for riparian management as a result of the workshops. Past-participant #5 had been planning on using a backhoe to clear trees and brush along his riverfront, but decided not to do so because of what he learned at the Riparian Workshop. Past-participant #7 had plans to do a controlled burn of the understory vegetation in his riparian area, but also decided not to because of the workshop. Two of the landowner couples and one of the individual past-participant interviewees were already implementing practices such as not clearing their riparian brush or removing large wood from the river. The two couples, however, had other reasons for not doing these common practices but are now aware of the ecological benefits of leaving their riparian area vegetation alone. One past-participant was unsure if any changes to his land management had occurred as a result of information from the Riparian Workshops because he was not the person primarily responsible for implementing management practices. This interviewee, as well as a majority of other past-participant landowner interviewees,
commented that they would take riparian areas into consideration when making future alterations or development plans.

Information from participant observation and trainer interviews provides additional evidence that landowner participants are beginning to make changes or think about ways they can change their management. A number of participants after each workshop approached trainers and told them that as a result of the workshop they would like to alter how they manage their riparian areas. According to Trainer #1, “I don’t think it’s the vast majority of people that say something [about changing/going to change their practices], but I’d say out of 20 people, maybe five say it each time. I’m hoping the rest are thinking it. But they’re not saying it out loud, [so] I don’t know.” For example, this trainer reported that a participant at one of the May 2010 workshops approached him afterwards and said that she had previous plans to spray her baccharis the following week, but was not going to now that she had attended the workshop. And trainer #4 noted: “We hear stories from people that they’re going to stop taking the dead wood out of creeks. That’s something that they can really see that they’ve been doing that is wrong.” Trainer #4 went on to say, however, that though they are hopeful that people are also changing their grazing management as a result of participation, they are not aware of anyone that has.

Agents and Other Influencers Use New Knowledge:

State and federal natural resource agency employees (particularly from the NRCS and Texas Parks and Wildlife Division (TPWD) indicated that they use or plan on using new knowledge acquired from the Riparian Workshops to assist the landowners with whom they consult. While agency personnel have reported sharing information and advice with landowners, it is less clear how their assistance has affected on-the-ground changes to landowner management. A TPWD employee who was a first time attendee at one of the May 2010 workshops mentioned that he learned a lot that he could use every day with the landowners with whom he works. Trainer #3 has witnessed other NRCS employees sharing their new knowledge with landowners when going out in the field to talk about deer or quail: “They’ll stop when crossing a creek and say to the landowner, ‘Let me tell you about what I learned in this workshop.’”

Past-participant #3, an NRCS district conservationist, said he was assisting landowners with riparian issues more frequently now as a result of attending the workshops; “I’d say anytime they have a creek or certainly river [frontage] we try to manage for that and bring those thoughts.” In particular, this NRCS agent has changed the way he works with landowners on managing their riparian vegetation. Their office gets a lot of calls from people asking about how and what plants to clear from their riparian areas. This agent now discourages landowners from killing their riparian vegetation, and uses the riparian plant guide produced by the Nueces River Authority to help assist landowners.

The Riparian Network workshops and literature have improved riparian advocates’ ability to explain to other people how clearing or mowing right up to the creek banks impacts the creeks. One workshop attendee said at a May 2010 workshop that she had used the riparian plant book to teach a landowner who had not attended a workshop about riparian plants. As a result, this landowner stopped mowing down to the river. Past-participant #6 had a similar experience with a couple of friends who he convinced to stop mowing their riparian area: “I can finally go back to them with proof. I’ve told them this all along, but they’re just like ‘ok, you’re always talking about this.’ [Now] I can speak from a better
source of knowledge than just acting like I decided it myself.” Additionally, Trainer #3 (and NRCS employee) noted that “it’s actually making it easier for us to work with the landowners because of the experience they get with these workshops.”

**Effective Strategies and Opportunities for Improvement**

The riparian plant guide *Your Remarkable Riparian* developed by the Nueces River Authority is by far the most effective strategy employed by the program to help participants apply the knowledge gained in the workshops to their own areas. All past-participants gave this guide high accolades and found it to be an invaluable resource. The guide has been used regularly both to assist participants in observing their own riparian areas, and to help advocates explain and share with other people the importance of riparian vegetation. In contrast, the Technical Reference Manuals on lotic and lentic riparian area management produced by the Bureau of Land Management, also available to participants at the workshops, were not found to be very useful. Workshop trainers referenced them numerous times to help guide their trainings, but no other past-participant interviewees referenced them. A few did say it was nice to know they could refer to them if they had a question in the future. A large number of interviewees noted the need for a layman’s guide to PFC, or inclusion of more background information on PFC in the *Remarkable Riparian* plant guide.

5. **Other Outcomes**

**Expansion Beyond the Nueces Basin**

Many individuals who are from outside the Nueces River Basin also attend the Riparian Workshops and some are enthusiastic about wanting to apply the information to their own areas. The Nueces River Authority and the trainers with the NRCS regularly get requests from people who have attended or heard about NRA workshops to come host workshops in areas outside the Nueces Basin. One of the Network trainers explained in an email how the Riparian Network has been a springboard for further demand for riparian information outside the Basin:

*The Nueces Network started all of this in Texas. Without Sky and the Network, we would be moving ahead at a snail’s pace. They have precipitated the energy and exposure of this. All of the various government agencies and their programs put together cannot begin to compare to the effectiveness and net results of what the Nueces Network has generated.*

The demand for Riparian Workshops and support outside the Basin has also been beneficial to the NRA. Partnerships and funding opportunities for the Nueces Riparian Network have emerged from groups or agencies interested in seeing the riparian message expand throughout the state, such as with the TPWD.

**Trainer Expertise**

Another outcome of the Riparian Landowners’ Network is the expertise developed in the Texas workshop trainers. The knowledge and practice gained by these individuals from facilitating the large number of trainings put on by the Nueces River Authority benefits the agencies they work for as well as the landowners they work with outside the Nueces Basin. These individuals help facilitate other similar workshops outside of the Basin, though less frequently, and will be invaluable assets to future expansion.
of the riparian message outside the Nueces Basin. The ability of agencies and landowners to continue to benefit statewide from the expertise of these individuals, however, is limited by two factors. One is that their time, availability, and funding to serve as trainers for these workshops is limited; and the other is that they are all, to varying degrees, close to retirement. These factors highlight the immediate need to expand the current generation (and build the next) of expert members of the Texas state riparian cadre.

**Discussion and Recommendations**

The Riparian Landowners’ Network has been instrumental in developing a strong foundation of riparian advocates both within the Nueces River Basin and across the state of Texas. This is indicated by the continued popularity of the Riparian Workshops, demands for bringing this knowledge to other areas of the state, and ability to secure continued funding for the program. In particular, the deftness and drive of Sky Jones-Lewey in single-handedly coordinating the expert resources employed for this program (among other programs in her purview), is highly laudable. Acknowledging the grassroots, passion-driven nature of the early stages of this program, our recommendations focus on improvements that might alleviate future programmatic pressures as the program continues forward at the current speed. No major “red flags” have been identified in the course of this evaluation, and we suggest that much can be built on the current program successes.

Although we recommend expanding the type of network offerings to further engage current riparian advocates, we also want to emphasize the importance of continuing with the current workshop offerings. There are still a significant number of riparian landowners in the Nueces River Basin who have not participated in the Riparian Network program. Individuals who have not yet participated are also most likely to face a number of the barriers to changing their riparian management practices, according to several interviewees. Top among these barriers is ‘tradition’ (“That’s the way we’ve always done it”); a barrier that the strategies employed by the Riparian Workshop are effective at addressing. The biggest challenge to affecting more area landowners through the current workshop offerings (outside of funding the program) will be to recruit them to the workshops in the first place. Continuing to engage past-participants and riparian advocates will help with this recruitment.

The biggest opportunity for improvement is in strengthening the programmatic linkages between the immediate, intermediate, and long-term desired outcomes. Due to the large number of variables responsible for changes to riparian areas and riparian function, a more systematic and long-term study would be needed to establish causality between the immediate outcomes associated with workshop attendance and long-term impact on riparian function. This type of study would require far more financial and human resources than are currently feasible for the Nueces River Authority, as is typical for many conservation education programs. It is important, therefore, to have as much strength in the theoretical assumptions underlying the program design as possible. The recommendations that follow are made with this intent in mind.
Recommendations

1. Revise the pre/post-test.

The foresight shown by Nueces River Authority staff in designing and implementing a pre/post-test from the outset of the Riparian Workshops is highly commendable. Results from this test have provided insight into how participants’ attitudes toward and knowledge and awareness of riparian areas have changed as a result of attending a Riparian Workshop. The current format of the pre/post test, however, particularly the wording of many of the questions, leaves room for a variety of different interpretations, reducing the validity of findings from the test. The validity of the pre/post test results could be greatly improved through a revision of the test questions and/or test design. Appendix D provides an in-depth analysis of the different possible interpretations of each question, and the possible influence this may have on each question’s validity. We hope that this question-by-question analysis will help with future revisions of pre/post test questions. A revision of the pre/post test questions should be done simultaneously with development of specific workshop learning objectives (see Recommendation #2, below) in order to ensure that the pre/post test is measuring the desired outcomes.

An approach to the pre/post test design that is worth considering is the “post-then-pre test.” This type of test is used at the end of the workshop, where participants self-report on a 1-5 scale what their knowledge (or understanding, awareness, appreciation, etc.) of certain aspects of the curriculum was before and after the workshop. The difference between the before score and the after score then gives insight into how much participants felt they learned. While this self-report method does not provide an objective measure of learning, the data may be more useful to the Nueces River Authority than the current pre/post test. This is because in the current pre/post test a large percentage of workshop participants answered most or all of the questions correctly on the pre-test. The test, however, only scratches the surface of the information presented in the workshops; there are most likely a number of other learning outcomes that have gone undetected. Asking participants to self-report learning in a post-then-pre test would help provide more nuanced data on what participants learn, and to what extent. This type of test could also be used in combination with the more objective pre/post test format currently in use. See the following link for a brief overview of this type of test from the University of Wisconsin Extension Service: [http://www.uwex.edu/ces/pdande/resources/pdf/Tipsheet27.pdf](http://www.uwex.edu/ces/pdande/resources/pdf/Tipsheet27.pdf).

2. Build workshop curriculum around specific learning objectives.

Interview, field observation, and pre/post test findings show that the primary learning outcomes of the Riparian Workshops are: 1) the importance and role of riparian vegetation, 2) the importance and role of large wood, and 3) the detrimental impacts of brushing, clearing, and mowing riparian area vegetation. The sheer quantity of information presented in the workshops makes it challenging, however, to assess the full scope of knowledge gained by participants. A high percentage of pre/post test respondents answered many of the questions correctly on the pre-test. The test, however, only scratches the surface of the information presented in the workshop; there are most likely a number of other learning outcomes that have gone undetected. The findings section lists key areas of learning identified by past-participant interviewees, but is not a representative sample. Developing specific
desired learning outcomes within the objective of increased knowledge about riparian function is recommended to aid in future evaluation, and to help refine the workshop curriculum.

The Riparian Workshops have been quite effective at increasing participant knowledge about riparian function, and it is clear that the original curriculum was designed with significant thought and foresight. Considering that demand for the training is growing outside the Nueces River Basin, and with the results of this evaluation in mind, this would be an opportune time to re-examine the curriculum with an eye towards simplification and transferability. Workshop trainers mentioned that they have struggled with how best to balance the quantity and depth of information covered in the workshop to meet the needs of the wide range of participants. While the trainers all agree on the intent and focus of the curriculum, specific learning objectives and desired outcomes (specific to the workshop curriculum) have not been developed. New trainers will begin to implement this curriculum as demand for the training grows outside the Nueces River Basin. This presents the risk that the learning objectives will become less clear or focused as new people adjust and add new information to the presentations. Specific, measurable, and achievable learning objectives and desired outcomes will help keep the curriculum consistent as it is transferred to new trainers, and will also help streamline future evaluation efforts.

3. **Develop measurable intermediate desired outcomes and metrics of success.**

The intermediate outcome developed for the logic model – “Landowners alter management practices to improve riparian function of own area” – is the central link in the program theory that connects program outcomes to on-the-ground changes in ecological conditions. Participants are exposed to a number of concepts and skills related to best management practices for riparian areas that are based on scientific evidence. On-the-ground implementation of knowledge gained as a result of the Riparian Workshop appears to be focused on ‘benign neglect’ changes, as described in the findings section. In order to strengthen the program logic that the on-the-ground changes implemented as a result of the Riparian Workshops will have a cumulative impact on ecological conditions in the region, the desired outcomes related to on-the-ground management changes need to be more specific and measurable. Specifying these desired outcomes will then highlight areas in the workshop curriculum that could be improved, and also aid in future evaluation efforts.

Another option for strengthening the connections between the intermediate outcomes and the long-term program goal would be to alter the long-term goal to be more achievable and measureable. An example of an altered long-term program goal could be that “X” percent of riparian landowners within the Nueces River Basin stop removing large wood and clearing brush and vegetation from their riparian areas.

4. **Quantify on-the-ground changes made by past-participants.**

The findings section noted that this study provides inconclusive evidence of the degree to which landowners have altered their management practices as a result of the Riparian Network. Increased awareness does appear to influence landowners to take riparian function into consideration when making decisions about their land, though the long-term outcomes of this consideration are unknown.
Additionally, natural resource agency personnel and other influencers are sharing their new knowledge with landowners they advise, but evidence of if and how landowners then use this advice to implement changes is lacking. In order to more conclusively link Network outcomes to any changes in on-the-ground riparian function, more extensive documentation of changes implemented by past-participants is needed than was undertaken for this evaluation. A quantitative past-participant survey would be a good way to assess this outcome more thoroughly.

5. **Expand Riparian Network opportunities.**

The number of enthusiastic riparian advocates in the Nueces River Basin (and beyond) increases with every new set of workshops. Increased appreciation and awareness of riparian function has moved many past-participants to want to continue to learn, attend or host additional workshops, and help spread the word about future Riparian Workshops. Riparian Workshops have also been successful at facilitating immediate interaction and relationship building around riparian areas. However, opportunities to continue to build these relationships and mobilize newly inspired riparian advocates into an interconnected network, or system of smaller networks, beyond the Riparian Workshops have not yet developed. Further opportunities to interact with the network would increase the ability of past-participants to use their shared knowledge to work together and better affect on-the-ground improvements to riparian function of creeks and streams in their area.

The focus of the workshop on teaching how creeks and streams function, but not pushing a specific solution or telling landowners how to manage their land, appears to be an effective approach for building the support and confidence of landowners in the area. This approach also helps set boundaries on the curriculum breadth, and recognizes the limitations on how much can be taught in a one-day workshop setting. However, a tension exists between this purposeful limit on the curriculum and the desire from participants for more information on how to apply the information to their land. Development of other network activities and resources, and/or a ‘Phase 2’ workshop that includes a focus on skills for riparian management and grazing could help satiate some of this demand, and would provide opportunities for continued network member engagement.

The centrality of vegetation related concepts to all other program outcomes, and the ability of participants to easily relate to and understand these concepts, is a powerful tool that could be further integrated into other opportunities and activities for cultivating riparian advocates. Examples of such opportunities could include partnering with the Texas Master Naturalists to assist landowners with riparian vegetation identification, hosting a field day focused on vegetation management for riparian grazing practices, or developing a Riparian Network internet blog where participants submit chronological photos taken of their riparian areas from photo points.

6. **Continue building partnerships to promote development of technical expertise in region.**

Increased awareness and appreciation of riparian areas is a central outcome of the Riparian Network. The Network influences participants to observe and monitor their own areas, and cultivates advocates for managing for riparian function. However, the ability of the program to affect on-the-
ground changes to riparian management is adversely impacted by the lack of riparian expertise in the state of Texas. Aside from the “benign neglect” steps such as not clearing, spraying, or mowing riparian vegetation and leaving large wood in the stream, the workshop curriculum is not focused on developing skills to design or implement riparian management changes or practices. The intent of the program is to raise awareness of the issues associated with riparian function, which will encourage landowners and managers to continue learning, to consider riparian function when making decisions, and to seek expert consultation before making any major changes. Unfortunately, technical expertise on riparian issues and management appears to be seriously lacking across all of Texas.

Trainers and past-participants have expressed concern that there are insufficient human resources in the state to help landowners implement best management practices for managing riparian areas. Every Texas land management agency employee interviewed said that the riparian curriculum is not information they learned in school, and that much of the content covered in the Riparian Workshops was completely new to them. This reinforces the need to increase the level of expertise of state and regional land management agency personnel, consultants, and other individuals who regularly influence landowner decisions. Additionally, the ability of the Nueces River Authority to continue offering Riparian Workshops at the current rate is threatened by the extremely limited number of riparian experts in the state to serve as workshop trainers.

While the target audience for the Riparian Network will continue to be landowners in the Nueces Basin, achievement of the long-term goal of improved riparian function will be unfeasible without sufficient expertise available to assist landowners. The Nueces River Authority staff is keenly aware of this need, and new partnerships between (TPWD) and other groups appear to be starting to address this issue. We recommend that the Nueces River Authority continue to pursue these partnerships, and to enlist the help of riparian advocates to further encourage federal and state agencies to prioritize training their workforce to be knowledgeable riparian expertise resources.

**Conclusion**

Numerous barriers to continued program operation and improvements were identified throughout the course of this evaluation. These primarily include limited staff time and availability to support the program, a limited number of riparian experts in the region available to facilitate workshops, and lack of secure funding. Chief among these barriers is the lack of a continuous, dedicated funding source. The Riparian Network program is funded entirely from grant and foundation support. While the program has many strong supporters and received numerous accolades, without continued funding the Nueces River Authority will be forced to greatly reduce, or eliminate, the Riparian Network program offerings.
References


### Nueces River Authority Riparian Landowners Network Logic Model

#### Appendix A: Logic Model

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Outputs</th>
<th>Immediate Outcomes</th>
<th>Intermediate Outcomes</th>
<th>Program Goal/Long-Term Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Riparian Workshops</td>
<td>1. # of workshops</td>
<td>Participant's knowledge of the principles of proper functioning condition and skills for enhancing riparian function increases</td>
<td>Participants use knowledge and awareness to observe and monitor riparian function of streams in own area</td>
<td>Improved riparian function on 5% of the 2,411 miles of major streams and tributaries in the Nueces River Basin</td>
</tr>
<tr>
<td>2. Educational Literature</td>
<td>2. # of participants</td>
<td>Participant's awareness of riparian areas and the values supported by riparian function increases</td>
<td>Landowners alter management practices to improve riparian function of own area (change and/or cease)</td>
<td></td>
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<tr>
<td>3. Landowner Consultations</td>
<td>3. # of repeat participants</td>
<td>Participant's appreciation for natural disturbances and aesthetics of healthy riparian areas improves</td>
<td>Agents and other influencers use new knowledge &amp; skills to influence changes in landowner/client management practices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Amount of literature disseminated</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- Riparian plant id books</td>
<td></td>
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<td></td>
<td>- Riparian note emails</td>
<td></td>
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<tr>
<td></td>
<td>- Your Remarkable Riparian brochures</td>
<td></td>
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<tr>
<td></td>
<td>- BLM general technical manuals (lotic, lentic, grazing)</td>
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<td></td>
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<tr>
<td></td>
<td>5. # of landowner consults</td>
<td>Participants interact with and meet neighbors, community members, &amp; professionals interested in riparian areas and streams</td>
<td>Participants continue to build and share awareness of riparian function, interact with other network members, and cultivate advocacy of managing for healthy riparian areas</td>
<td></td>
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</tbody>
</table>

1 The darkness of arrows in the logic model indicates the level of influence the Network has on the outcome. The Network has the most direct influence over the outputs and the learning outcomes of individuals.
Appendix B: Interview Guide

Introduction

1. Remind the interviewee about the study, its purpose. (to evaluate the effectiveness and outcomes of NRA’s Riparian Landowners’ Network project.)

2. Remind the interviewee about the NRA’s purpose, goals, vision, and specifically the Riparian Landowners’ Network and the purpose of the Riparian Workshops.
   a. The goal of the Riparian Network project is to develop a critical mass of people who will interact with each other and manage riparian resources based on shared knowledge.

3. Present interviewee with consent form, go through briefly, answer any questions, and have them sign it, noting whether they agree to be recorded. [If conducting a telephone interview, this document would have already been mailed to the participant.]

4. Ask the interviewee if they have any time constraints (and remember to check in at about an hour and see if they’re OK with continuing if you haven’t finished yet).

5. Provide a brief overview of what you’re going to cover
   a. The different Riparian Network and NRA activities you have had experience with
   b. Some background on your property/area and your land management practices
   c. Your perceptions of the **effectiveness** of the Riparian Network programs
   d. Your perceptions of the **outcomes** related to the Riparian Network in your area
   e. Your thoughts on what might have stood in the way of you implementing the tools and techniques that you learned during the Riparian Workshops/activities.
   f. Suggestions for improving the Riparian Network programs.

Experiences with the Nueces River Authority

1. Please tell me about your experience with the Nueces River Authority and the Riparian Landowners’ Network.

2. (show list of NRA workshops in the area) Which of these workshops have you participated in?
   a. Have you participated in any other Network activities:
      i. A landowner consultation?
      ii. Presentation to a civic group or community event?

3. How did you find out about the Riparian Landowners’ Network and Riparian Workshops?
   a. Had you previously heard of or interacted with the Nueces River Authority? If so, in what way?

4. Why did you decide to attend your first Riparian Network workshop?
   a. [if participant has been to multiple workshops] What made you decide to go a second [or third] time?

5. In what capacity did you participate?
   a. Part of your job, land manager, advisor to land manager, land owning family member, other?

6. What printed materials have you received from the NRA (Field Guide, brochure, Technical Reference manuals, Riparian Notes, other)?
General Land Management Practices
1. Tell me a little bit about your property and land management practices.

Outcomes
Knowledge and Attitude
1. Has your understanding of riparian areas and riparian function changed as a result of your involvement with the Riparian Network? How?
   a. How would you describe your understanding of riparian areas and their function prior to your participation in the Network?
   b. How much training or experience have you had outside Riparian Network activities that relates to understanding riparian areas and riparian management?
2. Did you have any “aha” moments during or after any of the workshops?
3. What one or two pieces of information that you learned from the workshop(s) stands out the most to you?
4. Has your attitude toward riparian areas changed, if at all, as a result of your involvement with the network?
5. What skills or tools did you gain that you could use on your property to help preserve or enhance your riparian areas?

Riparian Management
1. As a result of your participation in the Riparian Network, how have you taken riparian attributes and processes into consideration when making management plans or decisions on your land, if at all?
2. What have you done differently as a result of the knowledge you gained? Specific examples?
3. Do you think the riparian areas you manage have changed due to actions you’ve taken as a result of your involvement with the Riparian Network?

Network
1. How have your interactions with other users/owners/managers of your stream changed as a result of your participation with the Network?
2. Do you interact with other Riparian Landowners’ Network members now, more than before, outside of Network workshops?
3. Have you had conversations with other people about your involvement with the Riparian Network?
   a. With your neighbors?
   b. With your family members?
   c. With your trade groups?
   d. With your soil and water conservation board or local NRCS professional?
   e. Others?
   f. If so, what have you talked about? What was their reaction?

Overall
1. Do you think the riparian areas, as a whole in your larger region have changed as a result of the Nueces River Authority’s Riparian Landowners’ Network?
   a. Trends in functionality? Evidence?
Effectiveness of Riparian Network Activities and Products

1. What aspects of the Riparian Workshops [and consults] did you find the most effective at improving your understanding of riparian areas and function? Why?
   a. What aspects did you find the least effective? Why?

2. What do you think of the Riparian Network training team’s overall approach to training/facilitating?
   a. How well did the facilitators demonstrate an understanding of the particular issues you face in your area?

3. How effective have the print materials you received from the NRA been to you in your understanding of riparian areas and function?
   a. How useful were the materials to you during the Riparian Workshop?
   b. Has the information provided in these materials been useful to you since the workshop? If so, how? How frequently do you refer to the field guide or technical reference manuals?
   c. Is the information provided easy to understand and interpret?

4. How effective has the Riparian Landowners’ Network been at encouraging and/or facilitating interactions between you and other landowners in the network?
   a. What aspects of the Network program and workshops have been most effective at this?

Barriers/Constraints

1. If there have been no changes in your riparian area and/or land management as a result of your involvement with the Riparian Network, why not?

2. If you had unlimited time and/or resources, what changes would you make (start doing or stop doing) to your land or land management practices that would enhance or preserve your riparian areas?

3. What types of barriers or constraints do you think might be standing in the way?
   a. Financial constraints?
   b. On-the-ground realities?
   c. Need more Information/knowledge?
   d. Planning/time constraints?
   e. Social/community acceptance (neighbors and associates not interested, unfamiliar with riparian areas)?

Suggestions for Improvement

1. Do you still interact with the NRA and/or use them as a resource?

2. What suggestions do you have for improving the effectiveness of the Riparian Workshops specifically? The Riparian Landowners’ Network more broadly?

Conclusion

1. Are there any other relevant topics related to the Riparian Landowners’ Network programs that we haven’t covered that you’d like to discuss?
Appendix C: Pre/Post Test

How many acres of land are under your influence:

<table>
<thead>
<tr>
<th>Post</th>
<th>Slide One:</th>
<th>Slide Two:</th>
<th>Slide Three:</th>
<th>Slide Four:</th>
<th>Slide Five:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. True or False</td>
<td>3. Straight or Crooked</td>
<td>5. True or False</td>
<td>1) 2)</td>
<td>3 or 4</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Pre</th>
<th>Slide One:</th>
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<td>5. True or False</td>
<td>1) 2)</td>
<td>3 or 4</td>
</tr>
</tbody>
</table>

Answer Sheet

Location:

Date:
Slide One

What do you think?

1. Removal of water loving species like sycamore and willow or aquatic plants is the best way to increase stream flow. True or False

2. What is the primary riparian benefit from a flood? ____________________________

3. Do rivers want to be straight or crooked?

4. Most SWTexas riparian areas need to have the brush and trees removed in order to restore desirable vegetation. Yes or No

5. Fallen trees and log debris should be left in place when they fall or drift into a creek or river. True or False
What difference do you see between these two riparian areas?

1. __________________________
   __________________________
   __________________________
   ______

2. __________________________
   __________________________
   __________________________
   __________________________
   ______
Which riparian area do you think is healthiest? Why?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Slide Three
1. Remove some gravel.
2. Plant grass.
3. Thin out the trees.
4. Change grazing management.

If this was your riparian site what would you do first?
Which side of this creek would you like to own?
Appendix D: Pre/post test validity and scope of inference

Inference of pre/post test findings to the larger population of riparian landowners and agency personnel cannot be made because attendance of the workshops was voluntary, and likely attracts individuals already interested in rivers and streams. Results are only reflective of the group of individuals who took the test. In most cases, because the test was administered both immediately before and immediately after the classroom portion of the workshop, one can infer that changes in response were caused by the workshop. However, a number of the questions have multiple interpretations, which may have an influence on causality. Potential impacts of these issues are discussed below for each of the nine questions:

Question 1: **Removal of water loving species like sycamore and willow or aquatic plants is the best way to increase stream flow. True or false.**
This question is intended to measure knowledge of how vegetation impacts stream flow and whether the respondent considers riparian plant removal beneficial. While seemingly straightforward, it could be misleading or confusing to participants for two reasons. One is possible variations in the interpretation of the phrase ‘increase stream flow.’ There is a chance some participants could interpret increasing stream flow as the speed of stream flow, while others could interpret it as quantity of stream flow, or something else. Removal of water loving plants may actually increase the speed of the flow of a stream, but this is not the intended question. Secondly, the use of the term ‘best’ could possibly influence responses to this question. For example, a respondent could in fact think this was a good way to increase stream flow, but that other ways (such as channel straightening or removal of large wood) were ‘the best.’ The impact of these possible interpretations on the responses is unknown, though most likely negligible.

Question 2: **What is the primary riparian benefit from a flood?**
Because this is an open-ended question, there was a level of subjectivity in the way responses were scored. Responses that included some version of the following were scored as correct answers: ‘sediment,’ ‘sediment movement,’ ‘deposition’ and ‘soil build up.’ The most common incorrect response was some version of ‘clear out the creek’ or ‘clear sediment.’ Also, because this question asks what the primary riparian benefit of floods is, it may not be a completely accurate measure of change in knowledge about sediment transport and deposition. A change in response from pre to post test could measure two different types of learning. One is that the respondent did not know beforehand that sediment deposition from a flood is beneficial to the riparian area, and learned this through the workshop. The second could be that the respondent knew beforehand that sediment deposition occurs and is beneficial, but did not consider it the primary benefit. So the change in score in this instance would indicate a learning simply of the primacy of sediment deposition. The same options exist for respondents that showed no change in score from pre to post test; they could either not have learned about the benefits of sediment deposition at all, or they could have learned about it (or known in advance) and still felt that a different benefit was primary. More individuals than this data demonstrates may have learned and/or knew about this benefit from the beginning.
Question 3: Do rivers want to be straight or crooked?
A small number of test respondents commented that they found the wording of this question to be up for interpretation. This suggests that other respondents may have found the question confusing, leaving room for differing interpretations. Therefore, causation behind a positive change in answer on the post test could be either that the respondents did learn the correct answer, or that they realized they had interpreted the question differently. This question implies that rivers have “agency” - wanting to be one way or the other. One argue that a river naturally ‘wants’ to be straight, but when it comes up against an obstacle it will then bend and become crooked. Better wording might be “are rivers ‘naturally’ straight or crooked?” Though, as with the existing question, one could argue about the interpretation of “natural” as well.

Additionally, the answer to this question is given verbatim in the accompanying slide show after the post-test is administered, thus insuring that a large percent of respondents will get the question correctly on the post-test.

Question 4: Most SWTexas riparian areas need to have the brush and trees removed in order to restore desirable vegetation. Yes or No?
This question appears to ask two questions simultaneously; 1) do riparian areas need to have the brush and trees removed? And 2) does removing brush and trees restore desirable vegetation? Respondents may agree that brush and trees need to be removed, but may not agree that it will restore desirable vegetation (and many people would interpret desirable vegetation differently). Interviews and field work indicate that this is a very important area of learning from the workshops, so attention should be paid to ensuring that it is measured well. A simple rewording to “does removing brush and trees from riparian areas restore desirable vegetation?” would specify that the intent is to measure perceptions about restoration of desirable vegetation. Or, wording the question to something such as: “Is removal of brush and trees from riparian areas beneficial or harmful to riparian areas?” would measure perceptions specifically about brush and tree removal.

Question 5: Fallen trees and log debris should be left in place when they fall or drift into a creek or river. True or False
This question is relatively straight forward and misinterpretation of the question is most likely minimal.

Question 6: What difference do you see between these two riparian areas?
Question six should only be used as qualitative (descriptive) data in order to get a sense of how participant perceptions and/or vocabulary changes as a result of the workshop. Quantifying any results from this question would be both difficult and unreliable. Program staff should determine if the results from this question significantly aid in program improvements; if not, a question that measures more specific learning outcomes could be substituted.

Question 7: Which riparian area do you think is healthiest? Why?
The pictures used for this question appear to be either from different streams, or taken at different times of year. We did not find this question to be very meaningful at assessing learning outcomes, and would suggest that a different question is designed to measure a specific desired outcome.
Question 8: If this was your riparian site what would you do first? 1) Remove some gravel, 2) Plant grass, 3) Thin out the trees, 4) Change grazing management. Many test respondents wanted to pick multiple responses, or rank their responses in order of what they would do first, then second.

Question 9: Which side of this creek would you like to own?
Responses to this question are very interesting and provide a measure of attitude, rather than knowledge. We would suggest asking respondents ‘and why?’ in order to better understand the range of pre-existing attitudes and how, if at all, they change. There is a chance that respondents may answer this question “correctly” on the post-test because they think it is the “right” answer, rather than how they really feel.