The Meadows Center for Water and the Environment
Texas State University
Texas Stream Team

RIPARIAN EVALUATION CITIZEN SCIENTIST TRAINING PACKET

This training packet is an official record of the Texas Stream Team Riparian Evaluation Citizen Scientist Training.

Riparian Evaluation Citizen Science Training

The Riparian Evaluation training assesses the health of lakes, rivers, and streams based on the riparian habitat. Riparian evaluations are coupled with water quality data and used to track ecosystem and habitat health over time in the rivers and streams that flow to the Texas Coast. A riparian area is the transitional band of vegetation between waterways of all sizes and their uplands. It's the part of the landscape that borders a creek or river. When a riparian area is healthy and functioning properly it filters and slows run-off and floodwaters, and allows for sediment trapping, water storage and groundwater infiltration. The water quality benefits of a healthy riparian area are well documented.

It is important to evaluate riparian habitats because the indicators of riparian function can lead to the identification of activities that may be hindering the natural riparian recovery process. This training evaluates riparian health by using the Riparian Bull's-Eye Evaluation tool. The tool is designed around ten riparian indicators to guide the assessment of riparian landscapes for their function and identify activities that may be hindering the natural riparian recovery process. The goal of these evaluations is to involve citizens in the identification of riparian plants found within Texas and to cultivate awareness and appreciation for riparian plants and the role they play in the production of abundant, clean water.

The trainee must successfully complete a three-phase training program:

- **Phase I** – introduction to Texas Stream Team and background information, riparian and watershed processes, benefits of healthy riparian habitats, and introduction to the Riparian Bull's-Eye Evaluation Tool.
- **Phase II** – Side-by-side monitoring will be conducted with the trainer(s) utilizing the Riparian Bull's-Eye Evaluation Tool. The trainer observes the trainees' procedures, answers questions, and corrects mistakes.
- **Phase III** – the trainee conducts and completes the Riparian Bull's-Eye Evaluation Tool without guidance from the trainer.

What is Texas Stream Team?

Texas Stream Team is a network of trained citizen scientists and supportive trainers and partners working together to gather information about the natural resources of Texas while ensuring the information is available to all Texans. Established in 1991, Texas Stream Team is funded by the Texas Commission on Environmental Quality (TCEQ) and the U.S. Environmental Protection Agency (EPA).

Currently, hundreds of Texas Stream Team citizen scientists voluntarily collect water quality and additional environmental data on lakes, rivers, streams, wetlands, bays, bayous, estuaries, and riparian zones in Texas. Effective collection and management of water quality

and environmental data provides citizen scientists the opportunity to establish baseline conditions and identify changes in water quality and the environment and empowers them to take action if necessary. Texas Stream Team promotes the use of citizen scientist data at the local level, through partners, volunteers, schools, government agencies, business, industry, and others, for education and use in natural resource management decisions.

Texas Stream Team supports a wide range of citizen scientist activities, including water quality monitoring programs, bioassessment monitoring, environmental education programs, community action projects, statewide and regional conferences, and workshops.

Texas Stream Team Trainings and Programs

Texas Stream Team offers several trainings for people to get involved with Texas Stream Team and monitor Texas' valuable natural resources. Currently, Texas Stream Team offers:

- Standard Core Water Quality Citizen Scientist Training – monitors basic parameters such as conductivity, dissolved oxygen, pH, total depth, water and air temperature, field observations, and water transparency using a chemical Standard Core kit.
- Probe Core Water Quality Citizen Scientist Training - monitors basic parameters such as conductivity, dissolved oxygen, pH, total depth, water and air temperature, field observations, and water transparency using digital probe meters.
- *E. coli* Bacteria Water Quality Citizen Scientist Training - involves performing tests for *E. coli* bacteria to assess the potential risk of contact recreation in a water body.
- Advanced Water Quality Citizen Scientist Training – monitors parameters such as nitrate-nitrogen, orthophosphate, turbidity, and streamflow using an Advanced monitoring kit.
- Macroinvertebrate Bioassessment Citizen Scientist Training - Assess the health of your lake, river, stream, or estuary based on the aquatic insects that live there.
- Riparian Evaluation Citizen Scientist Training - assess the health of your lake, river, stream, or estuary based on the riparian habitat.

Along with our trainings, we offer a wide variety of engagement programs focused on taking citizen science monitoring to the next step through community involvement, awareness, and additional data collection. Currently, Texas Stream Team the following programs:

- Student Organizations – provides assistance and materials needed to create a Texas Stream Team student chapter.
- Watershed Protection Plans and Total Maximum Daily Load – works to improve water quality in impaired or threatened water bodies by endorsing stakeholder meetings, concerns, resources, and Texas Stream Team monitoring.

To get more information about upcoming trainings and events, visit http://bit.ly/tst-calendar-view to view our Texas Stream Team calendar.

Our Goals and Philosophy

Texas Stream Team is guided by these goals:

- To produce quality-assured data that government agencies, permitted entities, and the public can use to make environmentally sound decisions
- To improve communication and facilitate education about the natural resources in Texas
- To resolve conflicts over environmental impacts collaboratively
- These goals are founded on the premise that water issues are inextricably linked with air, biological, land, and human issues, and that the protection of all-natural resources requires the active, positive cooperation of all Texans.

Who Can be Involved?

Anyone with a desire to become a citizen scientist or learn more about the natural resources of Texas can be involved. Citizen scientists can monitor a wide variety of habitats. Numerous groups and individuals have been trained in Texas Stream Team protocols to date. They range in size from one person monitoring a single site to groups whose members monitor hundreds of sites. The minimum recommended school grade for participation is 9th grade, however any age younger than that can assist in monitoring efforts with supervision from a parent or legal guardian.

Texas Stream Team Citizen Scientists

Citizen scientists volunteer with Texas Stream Team by performing water quality and environmental monitoring activities or are students working under the guidance of a trained Texas Stream Team citizen scientist. Below are encouraged commitments for Riparian Evaluation citizen scientist participating in this program:

- Make at least a two-year commitment to monitor a site. Due to the annual or bi-annual monitoring frequency, two years of data is considered the minimum needed to capture baseline conditions and the natural variability at a site.
- Collect observational data at least one or two times a year to capture seasonality, or more if desired. It is essential that annual or biannual monitoring is conducted at the same time each year for accurate documentation of seasonal changes over time.
- If citizen scientists already perform routine water quality monitoring, riparian evaluations should be performed at their monitoring site(s) by evaluating both upstream and downstream. Other site selections may be chosen by Texas Stream Team and/or program partners and will depend on the suitability of each site to reach the intended monitoring goal.
- Submit the Riparian Evaluation Monitoring Form immediately following each monitoring event. Monitoring forms can be scanned or photographed and sent via email to TxStreamTeam@txstate.edu.

Texas Stream Team Trainers

Trainers are certified citizen scientists who have completed the Trainer Training process that qualifies them to train and perform quality control sessions. The Texas Stream Team Trainer Training is a four-phase process that introduces trainees to Texas Stream Team training procedures and processes. Trainer trainees must have successfully completed and received a

certification for whichever Texas Stream Team training they intend to become certified to lead. Trainer trainees must have at least 1 year of experience actively monitoring a site using the procedures that they intend to become certified to instruct.

Becoming a Riparian Evaluation trainer is granted on a case-by-case basis. Please contact Texas Stream Team if you are interested in becoming a Riparian Evaluation trainer.

Teacher and Student Participation

Educators find Texas Stream Team to be a valuable teaching tool that lends itself to cross-disciplinary instruction. By teaching students how to measure what is happening in the environment around them, Texas Stream Team helps teachers effectively present the abstract concepts of biology, chemistry, ecology, and geography. With a broader understanding of water quality issues, students are better prepared to understand and participate in local water resource management as well as career development.

Teachers who complete all phases of a training and become citizen scientists have two options for getting their students involved in Texas Stream Team citizen scientist activities. Students in grades K-12 can monitor a body of water alongside a teacher with activities based on the educational objectives of the class. A teacher who goes a step further and becomes a certified Texas Stream Team trainer for a training of their choice (ex. Core, Advanced, Riparian, etc.) can then train students (Grades 5-12) to become certified citizen scientists so students can monitor on their own.

Continuing Education Credit for Teachers

Teachers can receive credit hours for continuing professional education through the Texas Environmental Education Advisory Committee (TEEAC) by participating in meetings or training sessions offered by Texas Stream Team. Upon completion of the TEEAC requirements, each educator receives their TEEAC credit with their Texas Stream Team TEEAC certificate. More information can be found on the Texas Stream Team TEEAC Credit Trainings webpage.

Texas Stream Team Partners

Organizations partner with Texas Stream Team to grow citizen science activities in their communities. Texas Stream Team partners solicit public and private entities to help train, equip, manage, and offer general support to the growing number of citizen scientists across the state. Partners typically include citizens, industries, river authorities, government entities, water districts, cities, state and federal agencies, students, teachers, and private non-profit groups and foundations.

Texas Stream Team partners:

- Support and enhance environmental problem solving in partnership with citizens and public agencies
- Develop student interest in math, science, and environmental stewardship
- Establish an early warning detection network for potential environmental issues
- Encourage pollution reduction and prevention
- Demonstrate local commitment to environmental protection

Partner Benefits

Every business and organization in Texas is encouraged to become a Texas Stream Team partner. As a Texas Stream Team partner, you will receive benefits that will help you and your community reach environmental goals and earn recognition for your leadership activities.

These benefits include:

- Waterways, a quarterly newsletter for Texas Stream Team participants
- Recognition on the Texas Stream Team website, social media, and at regional and statewide meetings
- Technical assistance in implementing citizen science monitoring and education activities
- Outreach materials and nonpoint source watershed model for distribution upon request
- Supplement professional monitoring resources
- Certification as a Texas Stream Team citizen scientists, trainers, and quality assurance officers
- Customized data reports and datasets through the Waterways Dataviewer
- Professional networking opportunities
- Building stakeholder involvement through monitoring
- Watershed protection plan (WPP) stakeholder recruitment, support, and coordination
- Implementation of water quality monitoring/improvement plans
- Collaborative grant writing and fundraising

Partner Requirements

1. Texas Stream Team is required to provide 40-percent match for 319 Federal funding received by Texas Commission on Environmental Quality (TCEQ). Every Texas Stream partner will submit quarterly partner activity reports for all Texas Stream Team related activities, such as trainings, travel, staff time, education and outreach events, and supply costs. These reports can be found on our Partners webpage and can be submitted via email to TxStreamTeam@txstate.edu. However, they can also be submitted by mail to:

   Texas Stream Team
   The Meadows Center for Water and the Environment - Texas State University
   601 University Drive
   San Marcos, TX 78666
2. Partners are strongly encouraged to attend Texas Stream Team partner meetings on an annual basis to stay informed about the most recent program updates.

Types of Partners

The different types of Partners allow organizations to best use their resources to support citizen scientists. Organizations may become Texas Stream Team partners in the following ways:

- Patron Partners contribute funds as a one-time contribution or as on-going support to maintain program activities and/or any Texas Stream Team activities within their own membership. These contributions may be used to assist smaller groups, facilitate watershed monitoring efforts, or to fund general Texas Stream Team activities.

- Supporting Partners contribute in-kind services to an existing network of partners and volunteers. These services might include laboratory services, data management resources, and/or organizational staff to provide field or training support. Supporting Partners are independent entities within the overall Texas Stream Team umbrella but may occasionally require financial assistance from Texas Stream Team.

- Leadership Partners coordinate their own monitoring and education programs using the Texas Stream Team Program's standardized protocols and environmental education tools. A Leadership Partner may work with a network of Patron and Supporting Partners to support its group. Unlike Patron or Supporting Partners, Leadership Partners are entirely financially self-sufficient in supporting their Texas Stream Team activities. However, Texas Stream Team staff may assist Leadership Partners in writing grants to secure extra funding and loan out training materials whenever necessary.

- Educational Partners utilize Texas Stream Team's Education and Outreach materials and curriculum for purposes that may include:
  - Incorporating Texas Stream Team water quality monitoring as part of their educational activities
  - Utilizing Texas Stream Team/environmental educational curriculum, but not necessarily employing active water quality monitoring as part of their educational activities.

Texas Stream Team Partner Programs

Texas Stream Team works with partners all over the State, some which have led to combined efforts within Texas Stream Team monitoring events:

- Monofilament Finders – joins the efforts of the Texas Monofilament Recovery and Recycling Program (MRPP), led by the Texas Sea Grant to encourage the removal of monofilament line through clean-up efforts and by increasing monofilament stations in Texas.
- Nurdle Patrol – is a citizen science program based out of Port Aransas, Texas. This program is run by the Mission-Aransas National Estuarine Research Reserve at the University of Texas Marine Science Institute and focuses on bringing the community together to tackle plastic pollution, specifically focusing around nurdle awareness, location, and removal efforts.
- Trash Free Texas – is a citizen science program developed by multiple partners across the State, including The Meadows Center for Water and the Environment. This program focuses on bringing the community together by cleaning up Texas waterways through adopt-a-spot trash clean-up initiatives.

When you are out monitoring, be sure to indicate on your monitoring form if you have performed a nurdle survey or removed larger pollutants!

Quality Assurance Program

If citizen scientists choose to participate in the Texas Stream Team, they are required to follow the Quality Assurance Project Plan (QAPP). The QAPP is a TCEQ-approved document that ensures the information citizen scientists collect is of the highest quality

by providing the framework for citizen scientists to collect comparable data that can augment professional monitoring. By adhering to these procedures, Texas Stream Team program personnel and citizen scientists ensure data can be used for educational purposes, research, best management practice (BMP) effectiveness, and any other uses deemed appropriate.

For more information on the QAPP and how you as a citizens scientist should uphold the QAPP protocols, please visit our Data and Research webpage.

Texas Stream Team Waterways Dataviewer and Datamap

The Texas Stream Team Waterways Dataviewer is a web platform for trained citizen scientists to enter and view water quality data. The Dataviewer requires an account for access, so newly trained citizen scientists should contact their Training Coordinator and/or Data Coordinator to determine if they need to setup a Dataviewer account.

The Texas Stream Team Datamap is an online map that displays the locations and data for active and inactive Texas Stream Team monitoring sites. The Datamap was created for the general public to access and download historical citizen scientist data.

To access the Dataviewer and the Datamap, visit Dataviewer.TexasStreamTeam.org.

Texas Stream Team Newsletter, Website, Community Forum and Blog

Citizen scientists receive the Texas Stream Team Waterways Newsletter on a quarterly basis. They can unsubscribe to the newsletter any time by clicking the link at the bottom of the newsletter. Updates and information can also be found on the Texas Stream Team website, TexasStreamTeam.org.
Join the new Texas Stream Team Community Forum and Blog to share stories, pictures, knowledge and resources and to ask questions to the Texas Stream Team community. Our staff shares helpful blog posts and resources regularly. Registration takes only a minute and is required to participate in the forums. Join at https://tstcommunity.org/.

Texas Surface Water Quality: What Is It, and How Is It Measured?

To protect water quality, we must define and measure it. The state of Texas has established water quality standards to protect specific uses associated with streams, lakes, and estuaries, and has defined measurements to determine whether those uses are attained.

Based on the standards, the Texas Commission on Environmental Quality (TCEQ), in concert with other federal, regional, and local organizations, carries out a monitoring and assessment program to determine which water bodies are meeting the standards set for their use, and which are not. The state produces a periodic report, the Texas Water Quality Integrated Report for Clean Water Act Sections 305(b) and 303(d), which compares water quality conditions to established standards, as required by the federal Clean Water Act.

Texas Surface Water Quality Standards

- Designate the uses, or purposes, for which the state's waterways should be suitable;
- Establish numerical and narrative criteria for water quality throughout the state;
- Provide a basis on which TCEQ regulatory programs can establish reasonable methods to implement and attain the state's goals (criteria) for water quality.

Water quality criteria are designed to be protective of uses. Substantial deviations from criteria indicate that related uses might be impaired. For example, the concentration of dissolved oxygen is one criterion for determining the attainment of the aquatic life use. Where oxygen concentrations are low, the use of the water body to support aquatic life might be impaired. However, since other factors affect the health of an aquatic environment, additional data, such as the presence of a high number and variety of species, may show that the use is fully attained, even if oxygen concentrations are lower than the standard.

Four major categories for water use are defined in the Texas Surface Water Quality Standards:

- Aquatic life use
- Contact recreation (swimming)
- Public water supply
- Fish and shellfish (oyster) consumption

A variety of other general uses are also considered, such as navigation, water supply for agriculture and industry, seagrass propagation, and wetland functions.

Aquatic Life Use

The standards associated with the aquatic life use are designed to protect aquatic species and to protect the propagation of both aquatic and terrestrial species. They establish optimal conditions for the support of aquatic life and define indicators used to measure whether these conditions are met. Some pollutants or conditions that may violate this standard include low levels of dissolved oxygen, or high concentrations of toxins such as metals or pesticides in water.

Contact Recreation

The standard associated with the contact recreation use measures the level of certain bacteria in water that indicate the relative risk of swimming or other water sports involving direct contact with the water. It is possible to swim in water that does not meet this standard without becoming ill; however, the probability of becoming ill is higher than it would be if the standard was being met.

Public Water Supply

Standards associated with the public water supply use indicate whether water from a lake or river is suitable for use as a source for a public water supply system. Source water is treated before it is delivered to the tap. A separate set of standards governs treated drinking water.

Indicators used to measure the safety or usability of surface water bodies as a source for drinking water include the presence or absence of substances such as metals or pesticides. Concentrations of salts, such as sulfate or chloride, are also measured, since treatment to

remove high levels of salts from drinking water may be expensive.

Fish Consumption

The standards associated with the fish consumption use are designed to protect the public from consuming fish or shellfish that may be contaminated by pollutants in the water. The standards identify levels at which there is a significant risk that certain toxic substances dissolved in water may accumulate in the tissue of aquatic species.

Because toxic substances in water may exceed these levels while no accumulation in fish tissue is observable, the state conducts tests on fish and shellfish tissue to determine if there is a risk to the public from consuming fish caught in state waters. The standards also specify bacterial levels in marine waters to assure that oysters or other shellfish subject to commercial harvest and marketing are safe for public sale and consumption.

Indicators of water quality that are not tied to specific uses—such as dissolved solids, nutrients, and toxic substances in sediment—are also described in the standards. Indicators of water quality are discussed in more detail later in this document. A complete copy of the Texas Surface Water Quality Standards is available from the TCEQ Publications Library at 512/239-0020, or on the TCEQ website at https://www.tceq.texas.gov/waterquality/standards Texas Water Quality Integrated Report.

Fish Consumption Advisories and Closures

The Texas Department of State Health Services (TDSHS) conducts chemical testing of fish tissue to determine whether there is a risk to human health from consuming fish or shellfish caught in Texas streams, lakes, and bays. Fish seldom contain levels of contaminants high enough to cause an imminent threat to human health. However, risk increases for people who regularly consume larger, predatory fish from the same area over a long period of time. To reduce health risks, people should eat smaller fish from a variety of water bodies. When the TDSHS issues a fish consumption advisory, a person may still legally take fish or shellfish from the water body under the advisory, but it is not recommended. When a fish consumption closure is issued for a water body, the taking of fish or shellfish is legally prohibited.

Indicators of Water Quality

Several different water quality parameters are measured by the Texas Stream Team and the TCEQ to determine whether a water body meets the standards for its use. Some of the most common are listed here, with an explanation of why they are important to the health of a water body.

Bacteria

E. coli and Enterococci bacteria are measured to determine the relative risk of swimming (contact recreation), depending on whether the water body is fresh or marine. These bacteria originate from the wastes of warm-blooded animals. The presence of these bacteria indicates that associated pathogens from these wastes may be reaching a body of water. Sources may include inadequately treated sewage, improperly managed animal waste from livestock, pets in urban areas, aquatic birds and mammals, or failing septic systems.

Dissolved Oxygen

The concentration of dissolved oxygen is a single, easy-to-measure characteristic of water that correlates with the occurrence and diversity of aquatic life in a water body. A water body that can support diverse, abundant aquatic life is a good indication of high-water quality. A problem frequently related to dissolved oxygen concentrations is an excess of nutrients in water. Large quantities of nutrients in water can cause excessive growth of vegetation. This excessive vegetation, in turn, can cause low dissolved oxygen.

Dissolved Solids

High levels of dissolved solids such as chloride and sulfate can cause water to be unusable, or simply too costly to treat for drinking water uses. Changes in dissolved solids concentrations also affect the quality of habitat for aquatic life.

Metals

High concentrations of metals such as cadmium, mercury, and lead pose a threat to drinking water supplies and human health. Eating fish contaminated with metals can cause these toxic substances to accumulate in human tissue, posing a long-term, but significant health threat. Metals also pose a threat to livestock and aquatic life. Potentially dangerous levels of metals and other toxic substances are identified through chemical analysis of water, sediment, and fish tissue.

PHASE I

For Office Use Only
Group ID: _____
Partner ID: _____
Date Received: _____
Date Approved: _____
Approved by (name): _____

The Meadows Center for Water and the Environment
Texas State University
Texas Stream Team

Email to: TxStreamTeam@txstate.edu
Send to: Texas Stream Team
The Meadows Center - Texas State University
601 University Drive
San Marcos, TX 78666-4616

RIPARIAN ENVIRONMENTAL MONITORING FORM

PLEASE PRINT LEGIBLY

Sample Date
M M D D Y Y Y Y

Sample Time (military)
H H M M

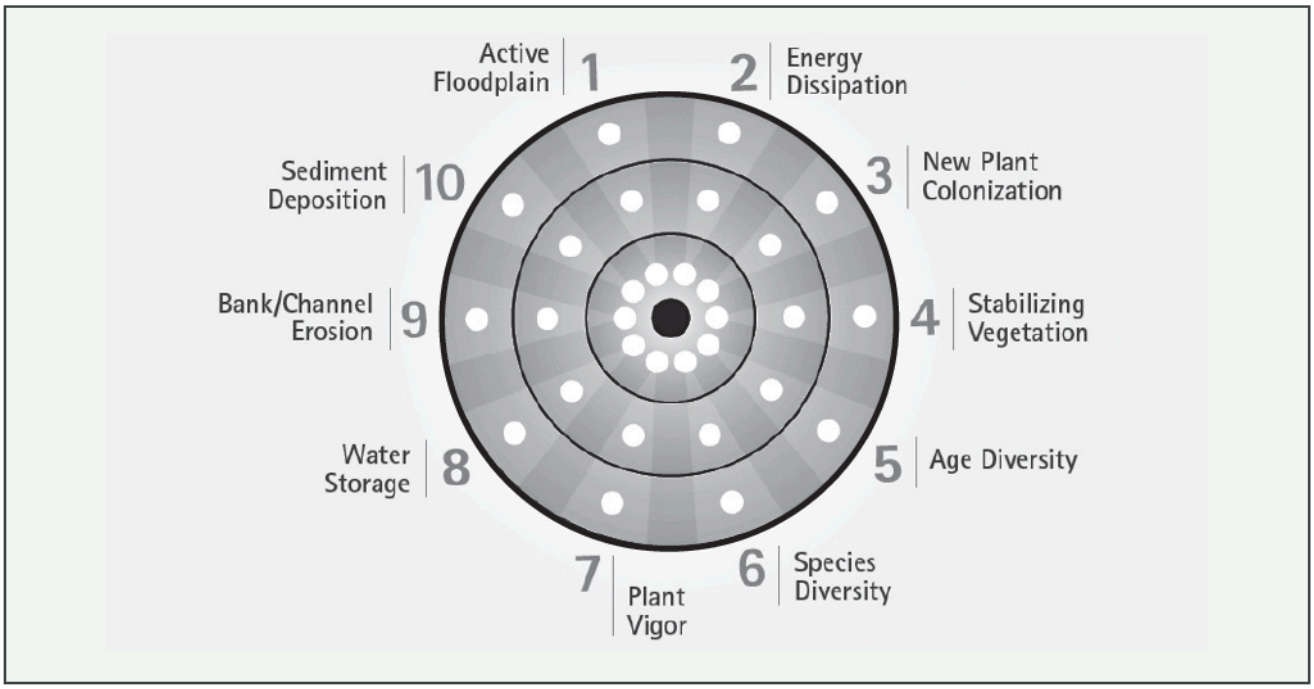
Site ID #

Citizen Scientist's Name _____

Site Name _____

Group or Affiliation _____

Bank evaluated: ☐ Left ☐ Right ☐ Both



Please be sure to include 1-4 photos when submitting your monitoring form.

NUMBER OF CIRCLES IN BULL'S-EYE: ☐

NUMBER OF CIRCLES IN MID ZONE: ☐

NUMBER OF CIRCLES IN OUTER ZONE: ☐

Presence of Litter:	Please check Yes or No	**Identified Species and Comments:**
MONOFILAMENT REMOVED Amount (please circle): 0-5 ft 6-15 ft 16 ft+	☐ Yes ☐ No	
NURDLE SURVEY	☐ Yes ☐ No	
TRASH REMOVED	☐ Yes ☐ No	

TOTAL TIME SPENT SAMPLING AND TRAVELING ☐ Minutes

TOTAL ROUNDTRIP DISTANCE TRAVELED ☐ Miles

TOTAL NUMBER OF PARTICIPANTS ☐

I certify that all procedures, including the items listed in the Quality Control Checklist in the Texas Stream Team training manuals, have been followed.

CERTIFIED CITIZEN SCIENTIST'S SIGNATURE _____ DATE _____

DATA COORDINATOR'S SIGNATURE _____ DATE _____

Prepared in cooperation with the Texas Commission on Environmental Quality and the United States Environmental Protection Agency.

PHASE II

For Office Use Only
Group ID: _____
Partner ID: _____
Date Received: _____
Date Approved: _____
Approved by (name): _____

The Meadows Center for Water and the Environment
Texas State University
Texas Stream Team

Email to: TxStreamTeam@txstate.edu
Send to: Texas Stream Team
The Meadows Center - Texas State University
601 University Drive
San Marcos, TX 78666-4616

RIPARIAN ENVIRONMENTAL MONITORING FORM

PLEASE PRINT LEGIBLY

Sample Date
M M D D Y Y Y Y

Sample Time (military)
H H M M

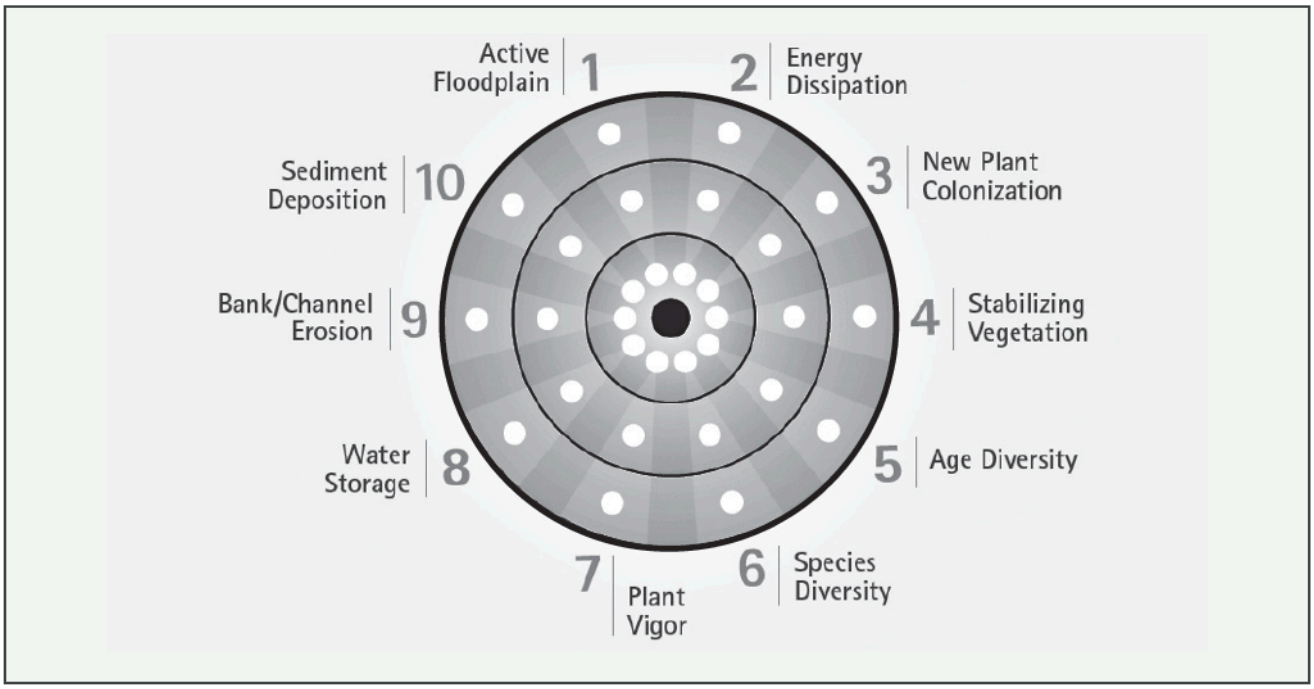
Site ID #

Citizen Scientist's Name _____

Site Name _____

Group or Affiliation _____

Bank evaluated: ☐ Left ☐ Right ☐ Both



Please be sure to include 1-4 photos when submitting your monitoring form.

NUMBER OF CIRCLES IN BULL'S-EYE: ____

NUMBER OF CIRCLES IN MID ZONE: ____

NUMBER OF CIRCLES IN OUTER ZONE: ____

Presence of Litter:	Please check Yes or No
MONOFILAMENT REMOVED Amount (please circle): 0-5 ft 6-15 ft 16 ft+	☐ Yes ☐ No
NURDLE SURVEY	☐ Yes ☐ No
TRASH REMOVED	☐ Yes ☐ No

Identified Species and Comments:

_____
_____
_____
_____

TOTAL TIME SPENT SAMPLING AND TRAVELING
____ Minutes

TOTAL ROUNDTRIP DISTANCE TRAVELED
____ Miles

TOTAL NUMBER OF PARTICIPANTS
____

I certify that all procedures, including the items listed in the Quality Control Checklist in the Texas Stream Team training manuals, have been followed.

CERTIFIED CITIZEN SCIENTIST'S SIGNATURE _____ DATE _____

DATA COORDINATOR'S SIGNATURE _____ DATE _____

Prepared in cooperation with the Texas Commission on Environmental Quality and the United States Environmental Protection Agency.

PHASE III

For Office Use Only
Group ID: _____
Partner ID: _____
Date Received: _____
Date Approved: _____
Approved by (name): _____

The Meadows Center for Water and the Environment
Texas State University
Texas Stream Team

Email to: TxStreamTeam@txstate.edu
Send to: Texas Stream Team
The Meadows Center - Texas State University
601 University Drive
San Marcos, TX 78666-4616

RIPARIAN ENVIRONMENTAL MONITORING FORM

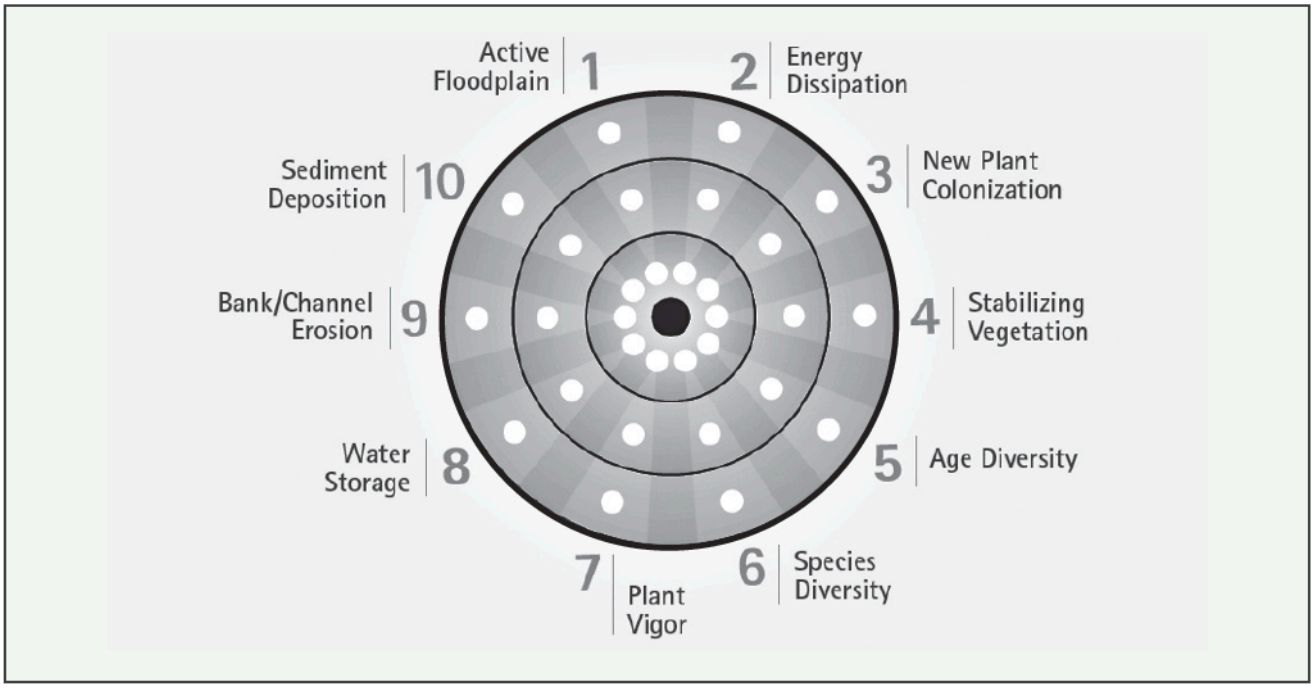
PLEASE PRINT LEGIBLY

Sample Date
M M D D Y Y Y Y

Sample Time (military)
H H M M

Site ID #

Citizen Scientist's Name _____
Site Name _____
Group or Affiliation _____
Bank evaluated: ☐ Left ☐ Right ☐ Both



Please be sure to include 1-4 photos when submitting your monitoring form.

NUMBER OF CIRCLES IN BULL'S-EYE: ☐
NUMBER OF CIRCLES IN MID ZONE: ☐
NUMBER OF CIRCLES IN OUTER ZONE: ☐

Presence of Litter:	Please check Yes or No	**Identified Species and Comments:**
MONOFILAMENT REMOVED Amount (please circle): 0-5 ft 6-15 ft 16 ft+	☐ Yes ☐ No	
NURDLE SURVEY	☐ Yes ☐ No	
TRASH REMOVED	☐ Yes ☐ No	

TOTAL TIME SPENT SAMPLING AND TRAVELING ☐ Minutes
TOTAL ROUNDTRIP DISTANCE TRAVELED ☐ Miles
TOTAL NUMBER OF PARTICIPANTS ☐

I certify that all procedures, including the items listed in the Quality Control Checklist in the Texas Stream Team training manuals, have been followed.

CERTIFIED CITIZEN SCIENTIST'S SIGNATURE _____ DATE _____
DATA COORDINATOR'S SIGNATURE _____ DATE _____

Prepared in cooperation with the Texas Commission on Environmental Quality and the United States Environmental Protection Agency.

RIPARIAN FIELD QUALITY CONTROL CHECKLIST

The following Field Quality Control Checklist is used by the Texas Stream Team Citizen Scientist to verify that the data are collected using approved protocols.

RIPARIAN INDICATORS	OUTER ZONE Poor, Dysfunctional Condition	MID ZONE At-Risk Condition	BULL'S-EYE High Functional Condition
☐ **1. Active Floodplain** Does floodwater have access to a floodplain? Look for recently deposited debris or silt from recent floods on both sides.	Limited or no apparent floodplain where floodwater can spread out and slow down.	Floodplain too far above channel to be very effective.	Floodplain clearly defined, allowing for floodwater to overflow channel, spread out, and slow down.
☐ **2. Energy Dissipation** Check if there is enough "stuff" in channels, on banks and in the floodplain to dissipate flood energy. Look on both sides.	Not many energy dissipating features in the channel, on the banks, or in the floodplain.	Only some energy dissipating features present.	Abundance of energy dissipaters present in the channel, on the banks, and in the floodplain.
☐ **3. New Plant Colonization** Look for new plants successfully colonizing on fresh sediment. Look on both sides.	Not much colonization; sediment deposits and point bars are bare.	Only some new plant colonization is on fresh sediment.	Abundance of new plants colonizing on fresh sediment.
☐ **4. Stabilizing Vegetation** Look for strong stabilizing plants along banks — those with a stability rating (SR) of 6 or greater.	Not much of bank is covered with stabilizing vegetation and tree roots.	Some gaps present and/ or some vegetation lacks sufficient stability rating.	Banks covered with stabilizing vegetation.
☐ **5. Age Diversity** Look for young, middle-aged and mature riparian plants present.	Few to no young and middle-age trees, shrubs, riparian grasses or sedges.	Only a few young and/ or middle-age riparian plants present.	In addition to older riparian plants, young and middle-aged plants are abundant.
☐ **6. Species Diversity** Look for the presence of several key, native riparian plant species.	No or low diversity: Only 1-2 native species of riparian trees, shrubs, and/or only 1-2 grasses and sedges.	Modest diversity: 3-4 species of native riparian trees, shrubs, and/or 3-4 grasses and sedges.	More than 5 different species of native riparian trees, shrubs, and/or more than 5 species of grasses and sedges.
☐ **7. Plant Vigor** Are riparian plants vigorous and healthy? Consult your Field Guide for information about a particular plant's palatability for grazing and browsing.	Unhealthy riparian plants. Woody plants show signs of heavy or chronic browsing; a Severe browse line can be noted. Riparian grasses and sedges compromised by grazing, mowing, or trampling.	Low vigor: Woody plants show signs of heavy browsing or hedging; A browse line may be present. Grasses and sedges show signs of heavy use, grazing, mowing, or trampling, only in places.	Healthy, vigorous riparian plants. Woody plants show little or no sign of heavy browsing or hedging. Grasses and sedges show little or no sign of heavy grazing, mowing, trampling, or other impairments.
☐ **8. Water Storage** Are the banks and floodplain storing water? Use your Field Guide to identify key Wetland Obligate and Facultative Wetland plants.	No OBL or FACW species are present, indicating a lack of water being stored in the riparian area.	Only a few OBL and FACW plant species present—and only along the stream's edge.	Several wetland plant species present—at water's edge and out on the floodplain too.
☐ **9. Bank/Channel Erosion** Look to see if bank and channel erosion is balanced with deposition on point bars. Look on both sides.	Continuous, active and extreme bank erosion with no apparent balancing by point bar deposition. Channel may appear either too wide or too deep.	Widespread bank erosion, beyond meander bends and not balanced by point bar deposition. Channel looks out of balance.	Light and balanced bank erosion on meander bends being compensated by deposition on point bars downstream. Channel appears to be of size and depth to manage sediment.
☐ **10. Sediment Deposition** Look to see if sediment is being deposited in a balanced way —on point bars downstream from eroded banks. Look on both sides.	Clearly excessive amounts of sediment, often in middle of the channel.	Some excessive sediment deposition, some mid-channel bars, but otherwise sediment is where it should be, on point-bars.	Normal and balanced Sediment deposition.