



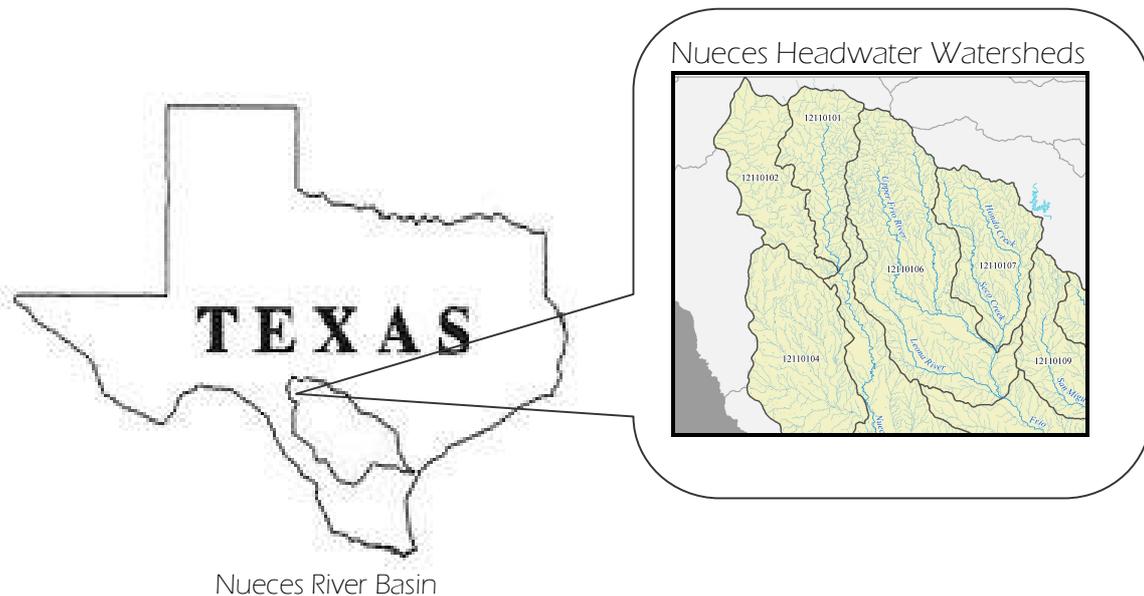
Nueces Headwaters Stewardship Project  
Final Report  
March 2008

Funding provided through a CWA §319(h) Nonpoint Source Grant  
from the Texas State Soil and Water Conservation Board and the  
U.S. Environmental Protection Agency  
TSSWCB Project 04-16  
Nueces River Authority

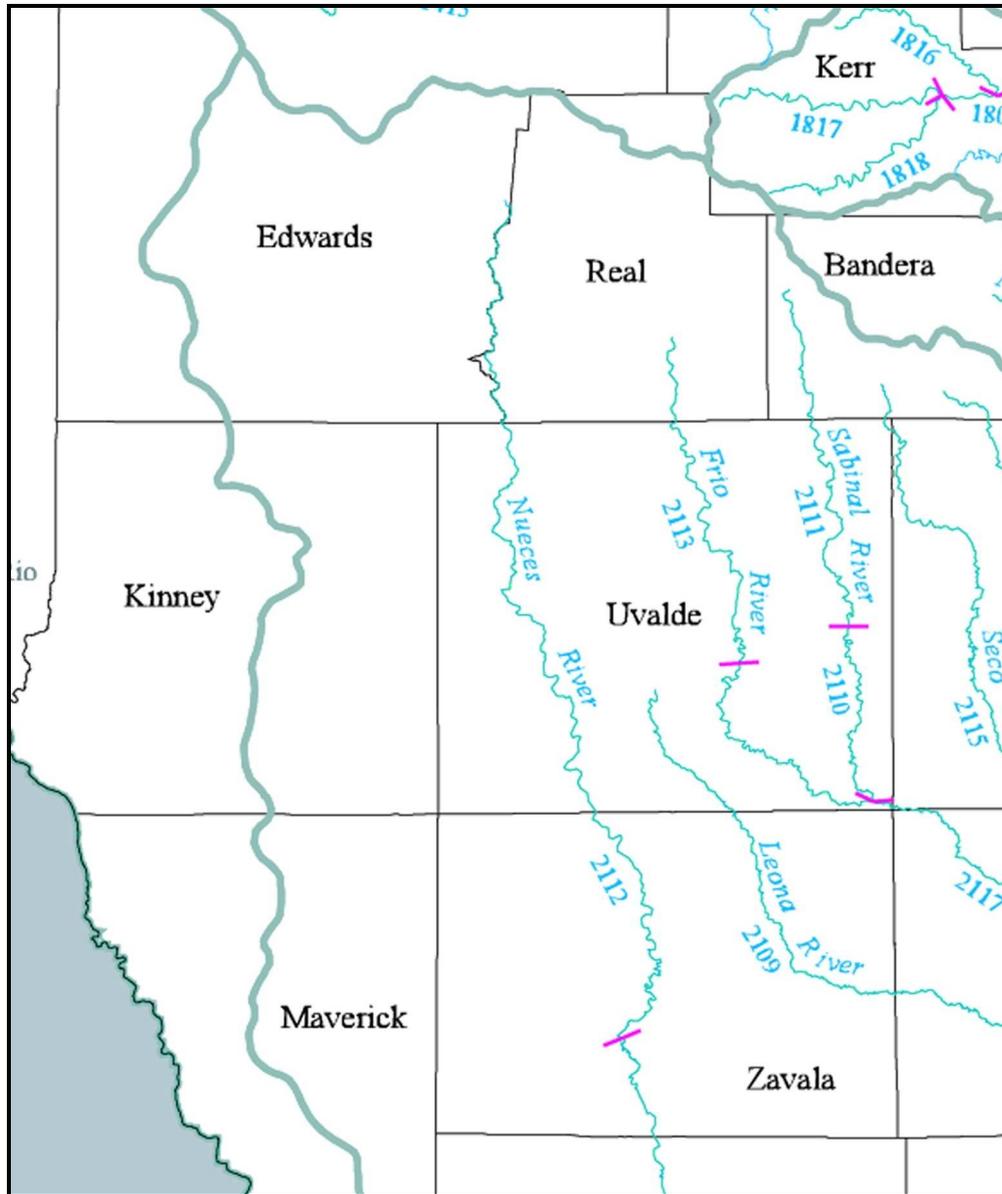
## Background

With a resident population of under 100,000 in five rural counties, the approximately 4,000 square miles that form the headwater watersheds of the Frio, Sabinal, Leona, Nueces and West Nueces rivers host a visiting population that may exceed 10 million each year. Water quality impairments and concerns have been identified in three of the five classified stream segments, and those still meeting all standards are at risk. Stream segment locations and parameters are presented in the following map and chart. The function and integrity of these special rivers has become threatened by litter and illegal dumping, mechanical disturbances of beds and banks, introduction and proliferation of invasive species and municipal and agricultural runoff.

With funding from a 2004 Clean Water Act §319(h) Nonpoint Source Grant through the Texas State Soil and Water Conservation Board and U.S. Environmental Protection Agency, Nueces River Authority initiated the design and implementation of an education program targeted at the headwater stream segments of the Nueces basin. The project was conceived as a means of protecting the still pristine streams and catalyzing a return of water quality in headwater streams suffering impairment. The goal of the project was to raise the level of public awareness of nonpoint source pollution threatening these streams and to encourage their protection.



NUECES HEADWATERS PROJECT AREA – Classified Stream Segments



2004 Surface Water Quality Assessment

<p><b>Segment ID:</b>                  2113, upper Frio River                  2112, upper Nueces River                  2111, upper Sabinal River                  2110, lower Sabinal River                  2109, Leona River</p>	<p><b>Parameter:</b>                  303(d) list for depressed DO                  meets all standards                  meets all standards                  303(d) list for Nitrate/Nitrite                  305(b) list for Nitrate/Nitrite and Sulfate</p>
--	--

## Project Summary

Beginning in October 2004, the Headwaters Stewardship Project aimed at protecting water quality through education; providing people with knowledge and tools to change polluting behavior and empowering them to make personal choices in favor of resource protection. It was a creative “home grown” effort implemented in cooperation with local organizations; one that continues to expand with the support of local and private funding sources.

Based generally on the strategies identified by the “Getting In Step” guide to conducting watershed outreach campaigns, published in December 2003 by the State-EPA Nonpoint Source Management Partnership, the Headwaters Stewardship project focused on three objectives:

1. **Recognize Value** - To make the public and landowners aware of the unique water quality and biological significance of Nueces basin headwater streams, their association with the Edwards and Carrizo Aquifers, and their value to communities and the region.
2. **Develop Accountability** - To create an awareness of activities that threaten the natural integrity of these streams and a conviction to assume responsibility for protection of them.
3. **Cultivate Involvement** – To empower landowners and the public, especially the youth, to actively preserve their natural integrity by making better individual choices.

In order to meet these objectives three target audiences were identified within the general population. They included:

1. **Students** - mostly 5<sup>th</sup> and 6<sup>th</sup> graders where existing Texas curriculum offers the best fit for watershed education.
2. **Landowners**- especially riparian landowners, many of whom are new to the area and new to landownership. Riparian areas in their proper functioning condition can help prevent nonpoint source pollution, providing multiple ecosystem benefits related to water quality and river health.
3. **Recreation-ists**- both local and visiting populations as well as the river related businesses that serve them. Litter is a high profile, readily visible nonpoint source pollutant that can leverage broadened awareness within this target audience.

A simple three part message was developed for delivery to the target audiences as well as the general public;

1. The river resource is precious and deserves attention.
2. Human behavior generates pollution and “More and More people” means more and more pollution. Rivers work best when their natural integrity is preserved.
3. Connectedness - Everything is connected in a watershed.
  - Creeks and ditches (and the land they drain) are connected to rivers.
  - Headwater streams are connected to coastal bays; the Cities of Corpus Christi and Rocksprings are connected.
  - Groundwater and Surface Water are connected.
  - Pollution is connected to human behavior and personal choice.

Three primary education activities emerged as effective tools to deliver the message to target audiences.

### **I Watershed Model Demonstrations**

Choosing a “hows and whys” approach to education, we created a 3 foot by 8 foot plastic scaled relief model of the Nueces River basin to demonstrate watershed function and the potential impacts of nonpoint source pollution.



*Nueces Basin watershed model under development 8-17-2005*

The model illustrates the connectedness of the headwaters streams to the Gulf Coast and personal behavior to water quality. Students run their fingers over the bumpy terrain, find where they live and trace a creek to its confluence with a river and the river down to the bays. They use dots of food coloring to illustrate pollutants, like; oil, antifreeze, paint thinner, litter, yard and garden chemicals and spray bottles to make rain, creating tainted

runoff which they follow downstream. Our watershed model lessons have been designed to compliment existing 5<sup>th</sup> and 6<sup>th</sup> grade curriculum and give students concrete examples of how pollution occurs, empowering them to prevent it and advocate prevention among others.



*Jones Elementary School, Bracketville*

*3-19-2006*

With the aid of this model and the \$319 funding, we took the lesson to the public; reaching 5,258, mostly 5<sup>th</sup> and 6<sup>th</sup> grade students, at 272 school presentations and 1,694 people of all ages at 27 public fairs and civic events. Because the watershed model works so well and the lessons have proven popular and effective, local groundwater conservation organizations have committed funding to allow Nueces River Authority to continue and expand the effort. Through cooperative agreements with three, local groundwater conservation districts, every 5<sup>th</sup> & 6<sup>th</sup> grade classroom in ten upper basin counties will be receiving this important watershed lesson each year.

Hundreds of adults and families have experienced hands-on learning with the basin model at civic events and community fairs arranged by these local districts. An additional 5,000 people outside of the original project area, in Frio, Medina and Atascosa Counties, have already been reached by this expanded effort and in the future approximately 10,000 people will be reached with the model each year in the Nueces basin.



July Jubilee 7-7-2007



Uvalde Garden Club 3-19-2006

The watershed model lessons we developed for the Headwaters Stewardship Project are now being employed by five other conservation/education organizations in Texas. Based on ours, the City of Corpus Christi and the Texas State Aquarium developed a second Nueces basin model for demonstration at their education facilities on the gulf coast. Two other river authorities; Guadalupe Blanco River Authority and the San Antonio River Authority, have now adopted the watershed model education program for their basins and are having models of their basins built. With guidance, support, and funding from the Nueces River Authority's Clean Rivers Program, the Arroyo Colorado Watershed Partnership recently incorporated the use of a custom watershed model of the Lower Laguna Madre HUC in their Watershed Protection Plan prescribed education effort.



Arroyo Colorado Model, Donna 9-27-07



Ag Fair, Kleberg County 3-2-2007



Natalia Elementary for Medina County GCD

11-1-2006

## II The Up 2 You Campaign

A growing interest in preservation of our headwater rivers for their recreational and aesthetic value helped create a high profile litter prevention/environmental protection campaign to encourage personal responsibility while reminding the public that nonpoint source pollution is a personal choice. The campaign slogan, “Clean Rivers/Rios Limpios – Up to You”, delivered in graphic script popular with the youth, was created as part of the Headwaters Stewardship Project. The slogans along with bold graphics were used on a high profile billboard during the summer of 2005. The billboard featured three of the graphic messages and spoke to river recreation-ists headed up the Frio and Nueces Canyons from Uvalde on State Highway 55 and U.S. Highway 83. Bi-lingual posters were distributed in class rooms and used to denote Up 2 You litter bag distributors.





U.S. Hwy 83 Northbound, at the intersection of TX Hwy 55, Uvalde

Summer 2005

Approximately 80,000 logo emblazoned litter bags were produced with private sector sponsorship and contributions of over \$15,000. These yellow bags were distributed and their use advocated by 64 river related businesses over three summer seasons to promote awareness and provide visitors with a means of becoming involved in resource protection. Litter bags distributors included grocery and convenience stores, tube and kayak rentals, shuttle operators, campgrounds, resorts and Garner State Park. About 60,000 of the bags were distributed to individuals on the Frio and Nueces rivers. Assuming that all bags were filled to capacity and not reused, approximately 6,000 cubic yards of litter were collected through this effort. The Up 2 U bags encouraged responsible river recreation among tourists and the project is working. Thirty-one people completed an Up 2 U opinion poll. The poll asked whether or not the campaign had helped reduce river litter in their section of river. It also sought suggestions for improvement and continuation of the campaign. While feedback and guidance offered for improvement varied, the majority of those polled agreed that the area of river they were most familiar with was cleaner because of the project. Local and private sector sponsors are committed to continuing the campaign through future summers.



*Frio Canyon, Summer 2005*



The slogan was also incorporated into the watershed model demonstrations where students go forth from each lesson with a personal litter bag and a new understanding of their responsibility for keeping rivers clean. The watershed lesson is reinforced by the Up 2 U campaign challenge to consider how their personal choices impact the water resources. The National Park Service adopted the Up 2 U logo and made litter bags for distribution on Rio Grande with sponsorship from business interests from that area.

# CleanRivers RíosLimpios



Litter bag courtesy of Big Bend Natural History Association, Big Bend National Park, Big Bend Ranch State Park, Big Bend River Tours, Desert Sports, Far Flung Outdoor Center and Rio Grande Adventures.

Up to You is a campaign created by the Nueces River Authority.

## LITTER BAG OPERATING PROCEDURES

- ① TIE ONE ON. Secure with your favorite knot so bag won't float or blow away.
- ② STASH TRASH. Smash cans flat and place all litter in bag through open end.
- ③ TAKE IT WITH YOU. Dispose of litter properly, reuse bag, and be the hero.

## INSTRUCCIONES PARA EL USO DE LA BOLSA DE BASURA

- ① AMÁRRALA. Asegura la bolsa con tu nudo favorito para que no flote o se vuele.
- ② AMONTÓNALA. Aplana las latas y junta toda la basura dentro de la bolsa usando su lado abierto.
- ③ LLÉVATELA. Bota la basura correctamente. Usa la bolsa nuevamente y transfórmate en héroe.

### III Land Stewardship

Based on the premise that what happens on the land determines the quality of water in rivers, the Nueces River Authority co-hosted three annual conferences on Land Stewardship and Water Resources. The conference brought timely and informative presentations from leading experts on land management practices that favor clean water to those who make decisions about the private land located in the headwater watersheds.

The three conferences registered over 388 attendees with a large percentage of them being landowners and land managers of riparian lands adjacent to Nueces basin headwater streams. Evaluation forms collected from participants noted an intention to implement or enhance land stewardship practices and a desire to learn more about the benefits of proper, natural functioning riparian areas. The Headwaters Stewardship Project land stewardship conferences helped to raise awareness about the connection between water quality and land stewardship and sparked the interest of many new landowners. Subsequently, the Nueces River Authority received funding from the Dixon Water Foundation for an off-shoot project to expand on the land stewardship efforts begun by this §319 project. The Headwaters Stewardship - Riparian Network Project, is a new education initiative focused on bringing riparian management information and expertise to river and creek side landowners, land managers and other decision makers. This project will be implemented in cooperation with interested Natural Resource Conservation Service offices and local Soil and Water Conservation Districts and will continue providing education opportunities to riverside landowners through 2010.

# THE ROLE OF STEWARDSHIP IN WATER RESOURCES

*Illustrating the Nueces River Headwaters Region*

Tuesday, November 16, 2004

Uvalde High School Auditorium



*how river and groundwater systems work*

*preserving natural riverine conditions*

- *Sustainability of our water resources*

*current threats to water quantity and quality*

*land stewardship and its connection to abundant clean water*

THIRD ANNUAL CONFERENCE

# LAND STEWARDSHIP AND WATER RESOURCES

Tuesday, November 14, 2006

8:30 a.m. to 3:30 p.m.

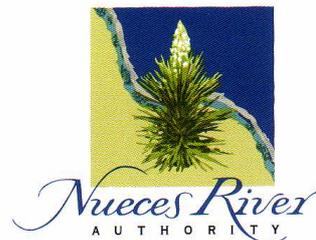
Uvalde High School Auditorium

One Coyote Trail, Uvalde, Texas

THE ECONOMIC INCENTIVE  
Value of Healthy Watersheds

## Hear from experts and leading thinkers on these topics:

- Income from land stewardship
- Reducing the cost of drought
- Incentive programs to keep rivers clean
- Responsible well ownership saves money
- Conservation easements for water quality protection



Hosted by Nueces River Authority  
with support from EPA 319 grant  
funding through Texas State Soil  
and Water Conservation Board.

Free admission • Valuable information • Make plans today

# SECOND ANNUAL CONFERENCE ON LAND STEWARDSHIP AND WATER RESOURCES



**Tuesday, November 15, 2005  
8:30 a.m. to 3:30 p.m.**

**Uvalde High School Auditorium  
One Coyote Trail, Uvalde, Texas**

## **Managing Land for Healthy Watersheds and Clean Rivers**

### **Hear from Experts**

*how* rivers get polluted

*how* watershed health is reflected in rivers

*what's* the connection between brush and water

*why* rivers move and where gravel comes from

**why your stewardship is important**

**Free admission**

**Valuable information**

**For all land managers**

## **Project Support**

The Headwaters Stewardship Project was founded on cooperation with local conservation organizations and public and private sector stakeholders. The relationships created and fostered in the Headwaters Stewardship Project are perhaps the most valuable long term result of the project.

Nueces River Authority participated in a total of 74 meetings with local conservation and water quality planning organizations, including: Texas AgriLife Extension Service, local Soil and Water Conservation District Boards, Rio Grande Nueces Resource Conservation and Development Council, Clean Rivers Steering Committee, and other conservation organizations. About 64 local businesses were involved in providing guidance and received information from project staff. In preparing and scheduling watershed demonstrations and other education activities, 17 schools participated.

## **Project Administration**

Thirteen informative and timely progress reports were produced totaling over 1,000 pages. Planning meetings and consultations with TSSWCB was regular and productive. Thirteen reimbursement forms and statements were produced in a timely and accurate manner. Backup documentation to support allowable costs was maintained and monitored along with budget activity and cost accountability. The project was completed within the approved budget.

## **Measures of Success**

- 60,000 litter bags used by river recreation-ists
- approximately 6,000 cu. yds. of river litter prevented
- 64 river related businesses advocating the “Clean Rivers Up 2 U” message
- 5,258 students and 1,694 adults participated in watershed model demonstrations in the headwaters project area (over 10,000 basin wide)
- results of an informal public opinion poll indicating – “Yes, the education program is working”

- news accounts of motivated river visitors, or “volun-tourists”, advocating litter prevention, example:



- letters and illustrations received from students, example:



## **Conclusion**

Headwaters Stewardship Project has been an exceptional and highly creative project aimed at conserving and protecting an exceptional resource. The headwater streams of the Nueces basin represent some of the last relatively pristine river ecosystems in Texas. They provide important groundwater recharge to major source waters for Texas. Downstream, public water supply reservoirs are fed by these streams and they support a vibrant coastal estuary system. While environmental education has been a component of school curriculum in many Texas cities, rural areas like the headwaters of the Nueces River basin have been underserved. Those living closest to these pristine streams have the greatest opportunity to protect them but the least knowledge about how they work. This project has contributed to the resolution of this problem in an exceptional, creative “home grown” way.

The Headwaters Stewardship Project, made possible through a CWA §319(h) nonpoint source grant from TSSWCB and EPA, helped to raise the awareness of thousands of people, change polluting behaviors and kept thousands of cubic yards of litter out of rivers. Perhaps more importantly, it paved the way for an expanded sustained education effort by providing the education tools, enlightened audiences, and a cooperative capacity among local conservation organizations. This project has become a model for pollution prevention through education and has attracted local funding for continuation and expansion of successful activities.