Watershed Planning to Protect and Restore New Mexico Waters with 319(h) Grant Funding

2010 New Mexico Watershed Forum
September 28-30, 2010
Albuquerque, New Mexico

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Hilary Brinegar, NM Department of Agriculture

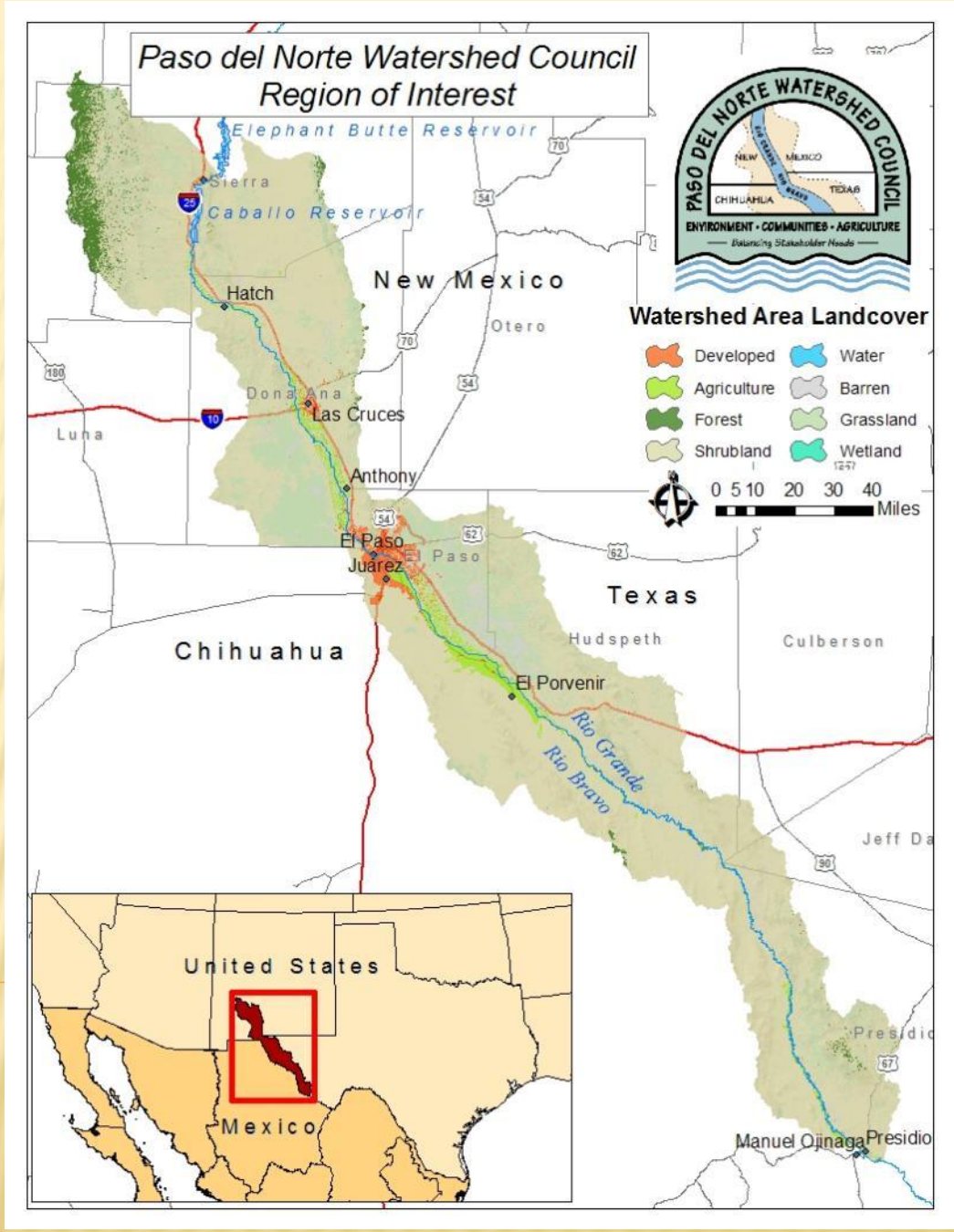
Presentation Topics

- The Paso del Norte Watershed Council
- Introduction to Elements A, B, C
- Lower Rio Grande Geography
- Source Identification Exercise
- LRG Watershed Based Planning Process

Paso del Norte Watershed Council

Established in 2000, the Council originally served as an advisory body to the NM-TX Water Commission in the development of the El Paso-Las Cruces Regional Sustainable Water Project.

The purpose of the Council is to investigate, develop, and recommend options for watershed planning and management, and to explore how water-related resources can best be balanced to benefit the Paso del Norte watershed ecosystem and the interests of all watershed stakeholders.


Paso del Norte Watershed Council
Region of Interest
Elephant Butte Reservoir
Caballo Reservoir
Sierra
Hatch
New Mexico
Otero
Dona Ana
Las Cruces
Luna
Anthony
El Paso
Juarez
El Paso
Texas
Chihuahua
Hudspeth
Culberson
El Porvenir
Rio Grande
Rio Bravo
Jeff Da
Presidio
Manuel Ojinaga
Presidio
United States
Mexico
PASO DEL NORTE WATERSHED COUNCIL
ENVIRONMENT • COMMUNITIES • AGRICULTURE
Balancing Stakeholder Needs
Watershed Area Landcover
Developed
Agriculture
Forest
Shrubland
Water
Barren
Grassland
Wetland
0 5 10 20 30 40
Miles

The Council, Con't

The Council currently supports projects such as the 319(h) Watershed Based Plan, the Water Resources Coordinated Database-GIS, and River Basin Hydrologic Modeling efforts (in coordination with URGWOM).

Committees:

Technical

Clean Water

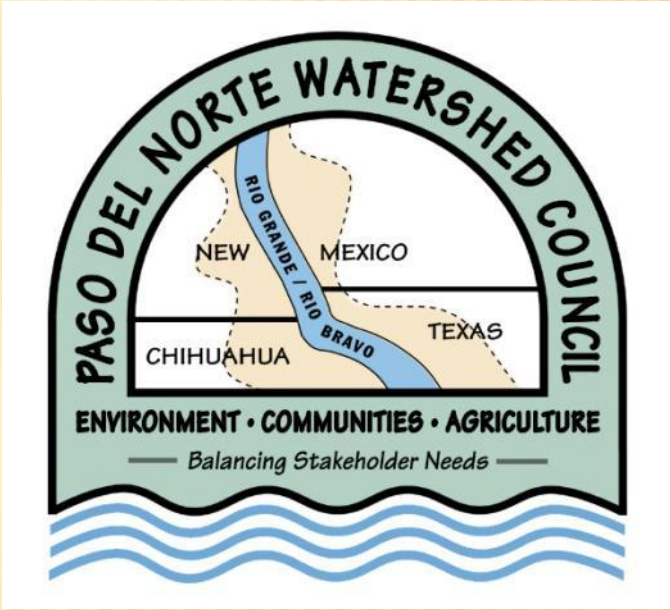
Biology

Education

www.pdnwc.org

Council Member Organizations

Chihuahuan Desert Wildlife Rescue
City of Las Cruces
El Paso League of Women Voters
Frontera Land Alliance
Isleta del Sur Pueblo
New Mexico Department of Agriculture
New Mexico State University
New Mexico Water Resources Research Institute
Rio Grande Restoration
Southwest Environmental Center
Texas AgriLife Research Center at El Paso
Universidad Autonoma de Ciudad Juarez
University of Texas at El Paso
U.S. Bureau of Land Management
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. International Boundary and Water Commission

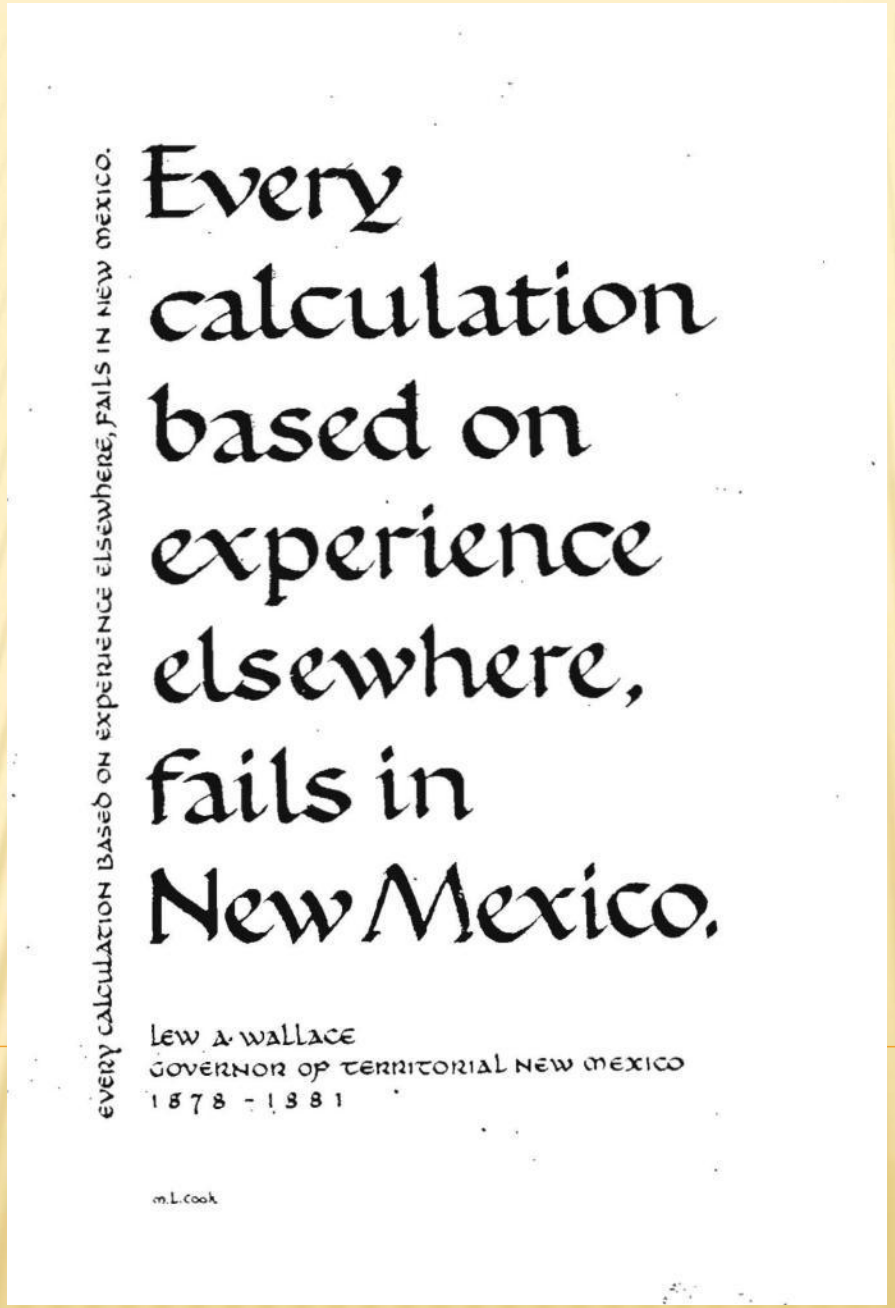


Watershed Planning with 319(h) Funds

Watershed planning can take multiple forms

Ie. NRCS, BLM, USFS, EPA

We will highlight the foundation of watershed planning utilizing U.S. EPA 319(h) funding in New Mexico. This can vary state to state within the same EPA region.


EVERY CALCULATION BASED ON EXPERIENCE ELSEWHERE, FAILS IN NEW MEXICO.
Every calculation based on experience elsewhere, fails in New Mexico.
LEW A. WALLACE
GOVERNOR OF TERRITORIAL NEW MEXICO
1878 - 1881
m.L.cook

The Nine Elements

a. Identification of causes and sources
b. Estimate of needed load reductions
c. Description of management measures
d. Estimate of technical and financial assistance
e. Information / education component
f. Schedule for implementation
g. Description of measureable milestones
h. Criteria developed to determine if load reductions are achieved
i. Monitoring component to evaluate effectiveness

CWA Section 319 Grant Guidelines:
http://www.epa.gov/owow_keep/NPS/cwact.html

U.S. EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters

http://water.epa.gov/polwaste/nps/handbook_index.cfm

TOTAL MAXIMUM DAILY LOAD DEFINITION

A specified maximum amount of a pollutant that a waterbody can receive on a daily basis without exceeding state water quality standards.

Also known as a target capacity value.

TOTAL MAXIMUM DAILY LOAD DEFINITION

NMED-SWQB

"…a planning document that established specific goals to meet water quality standards in water bodies where pollutant limits are exceeded. It includes current pollution loadings, reduction estimates for pollutants, information on probable sources of pollution, and suggestions to restore or protect the health of the waterbody."

LOWER RIO GRANDE WATER QUALITY REGULATORY HISTORY

Feb-Nov 2004	LRG Water Quality Survey
April 2006	Survey Report
Feb 23, 2007	Draft LRG TMDL
	45 day comment period
April 9, 2007	Las Cruces public meeting
May 8, 2007	TMDL approval by NM WQCC
June 11, 2007	TMDL approval by EPA

Element a
IDENTIFICATION OF CAUSES AND SOURCES

The **cornerstone** for all elements of watershed based planning.

Watershed characterization:

- Physical and natural features
- Land use
- Population
- Existing data

Pollutant Causes and Sources

CAUSE = TMDL

The TMDL allocates the load between point sources and nonpoint sources, but **does not quantify the nonpoint sources**.

Identifying and quantifying NPS is a main task for Element a.

SOURCE = has geographic location, may be attributed to an activity in the watershed, may have seasonal or climatic fluxes

Pollutant Causes and Sources, Con't

Ask the questions:

Where are the greatest sources of the pollutant located?

Define on sub-watershed/site scale.

What land use activity is related to the pollution?

Examine local land use activity.

Geographical definition and source-specific identification are critical.

Element b
ESTIMATE OF NEEDED LOAD REDUCTIONS

Based on source identification, water quality goals, and when implementing restoration projects, is based on the effectiveness of management measures.

Two separate components:

1. Planning: estimate reductions needed to meet water quality goals. (Do goals equal WQ standards?)
2. Implementation: estimate expected reductions based on implementing management measures (Element c).

Element b
ESTIMATE OF NEEDED LOAD REDUCTIONS

Process:

1. Allocate load estimates per source
2. Choose suite of BMPs (Element c), determine utility and location of implementation
3. Estimate load reductions per BMP

Resources: stakeholder input, local knowledge base, technical expertise, data management, modeling

Element b
ESTIMATE OF NEEDED LOAD REDUCTIONS

An inexact science!

Factors: natural variability, BMP performance, time-consuming process.

Others: access to data and technical expertise.

Element c
DESCRIPTION OF MANAGEMENT MEASURES

What measures are appropriate and effective for achieving your goals?

Depends on pollutants of concern and sources of pollution.

Lots of choices for BMPs.

Recommendations could look at an integrated combination of management and restoration.

Element c
DESCRIPTION OF MANAGEMENT MEASURES

Best management practices

*Are they really the **best**?*

Are they socially acceptable?

Other factors for selection:

Location (land ownership, access), estimated load reductions, legal/regulatory requirements, costs, unintended consequences.

240 Filter Strip

TMDL Practice Sheet

LEVEL 200: ACTIVE MANAGEMENT

DESCRIPTION

A strip or area of herbaceous vegetation situated between cropland, grazing land, or disturbed land (including forest land) and environmentally sensitive areas.

PURPOSE

A filter strip removes pollutants from runoff before the material enters a body of water. It also serves as a buffer between water and the fields above the water so that pesticides and other chemicals are not applied directly adjacent or into the water body. Filter strips also reduce sedimentation of streams, lakes and other bodies of water.

PRACTICE CATEGORIES

Stream Bank Protection
Recreation Management
Construction Site Management
Stormwater Control
Mining Lands Management
Cropland Management

TMDL SOURCES TREATED

Animal Feeding Operations
Disturbed Areas
Stream Erosion
Agricultural Practices

POLLUTANTS ADDRESSED

Sediments
Salinity
Pesticides
Pathogens
Nutrients & Organics
Heavy Metals
Low Dissolved Oxygen

LOAD REDUCTION POTENTIAL

○ LOW ○ MEDIUM ◉ HIGH

ESTIMATED TIME FOR LOAD REDUCTION

○ IMMEDIATE ◉ MONTHS-2 YEARS ○ > 2 YEARS

EXPECTED MAINTENANCE

◉ LOW ○ MEDIUM ○ HIGH

240 Filter Strip

TMDL Practice Sheet (cont.)

LEVEL 200: ACTIVE MANAGEMENT

POTENTIAL TREATMENT AREAS

Agricultural Lands
Developed Lands

ASSOCIATED TMDL PRACTICES

Exotic Removal
Seeding
Fencing

PERMITTING REQUIREMENTS

None

APPLICABLE NRCS/OTHER REFERENCES

NRCS-FOTG
393 Filter Strip

PLANNING CONSIDERATIONS

Filter strips should be strategically located to reduce runoff, and increase infiltration and ground water recharge throughout the watershed.

Filter strips for the single purposes of wildlife/beneficial insect habitat or to enhance watershed function should be strategically located to intercept contaminants thereby enhancing the water quality of the watershed.

To avoid damage to the filter strip consider using vegetation that is somewhat tolerant to herbicides used in the upslope crop rotation.

Consider using this practice to enhance the conservation of declining species of wildlife, including those that are threatened or endangered.

Consider using this practice to protect National Register listed or eligible (significant) archaeological and traditional cultural properties from potential damaging contaminants.

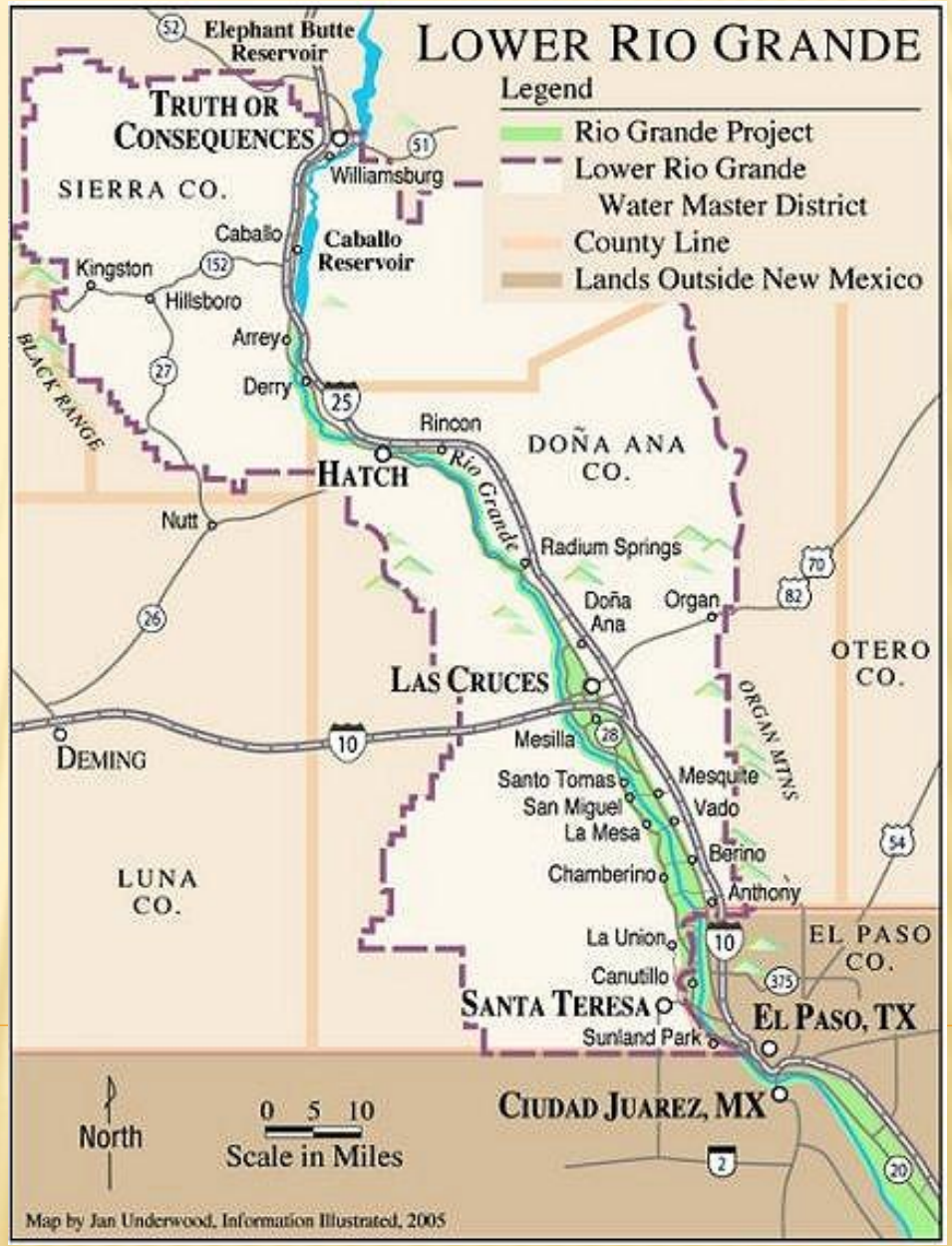
Filter strip size should be adjusted to a greater flow length to accommodate harvest and maintenance equipment.

Lower Rio Grande

Area = 29,267 mi^2

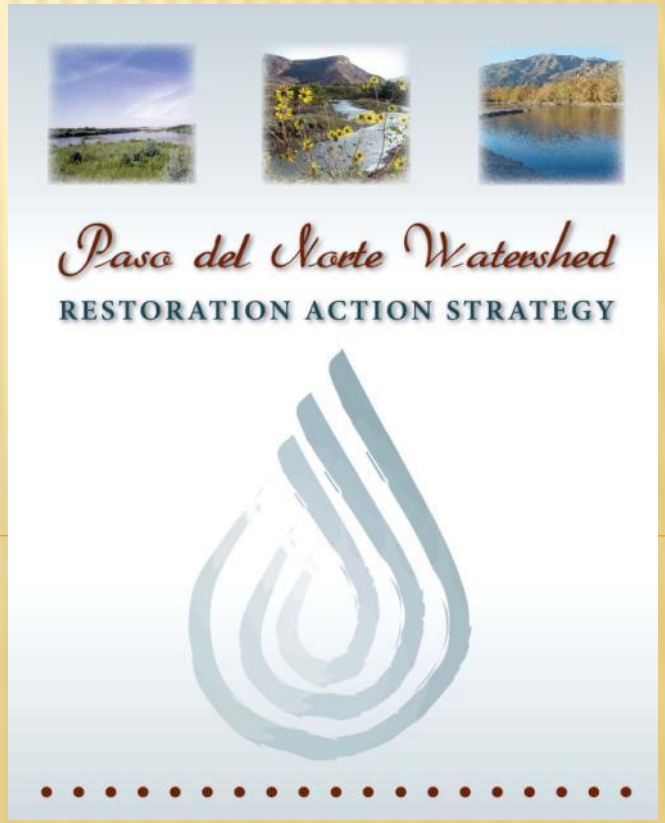
107 river miles are within the 319 project area

Varied land use



An Example
Lower Rio Grande Watershed Based Plan

- The Paso del Norte Watershed Council received 319(h) grants in 2006 (Phase I) and 2010 (Phase II)
- Lower Rio Grande TMDL for *E. coli*



Las Cruces Population – 86,268

Doña Ana County Population – 206,419

Rio Grande Canalization Project
130 miles of levees

Seldon Canyon – 8.6 miles
No levees

457 miles of agricultural drains.
The only perennial tributaries in the watershed.

457 miles of agricultural drains.
The only perennial tributaries in the watershed.

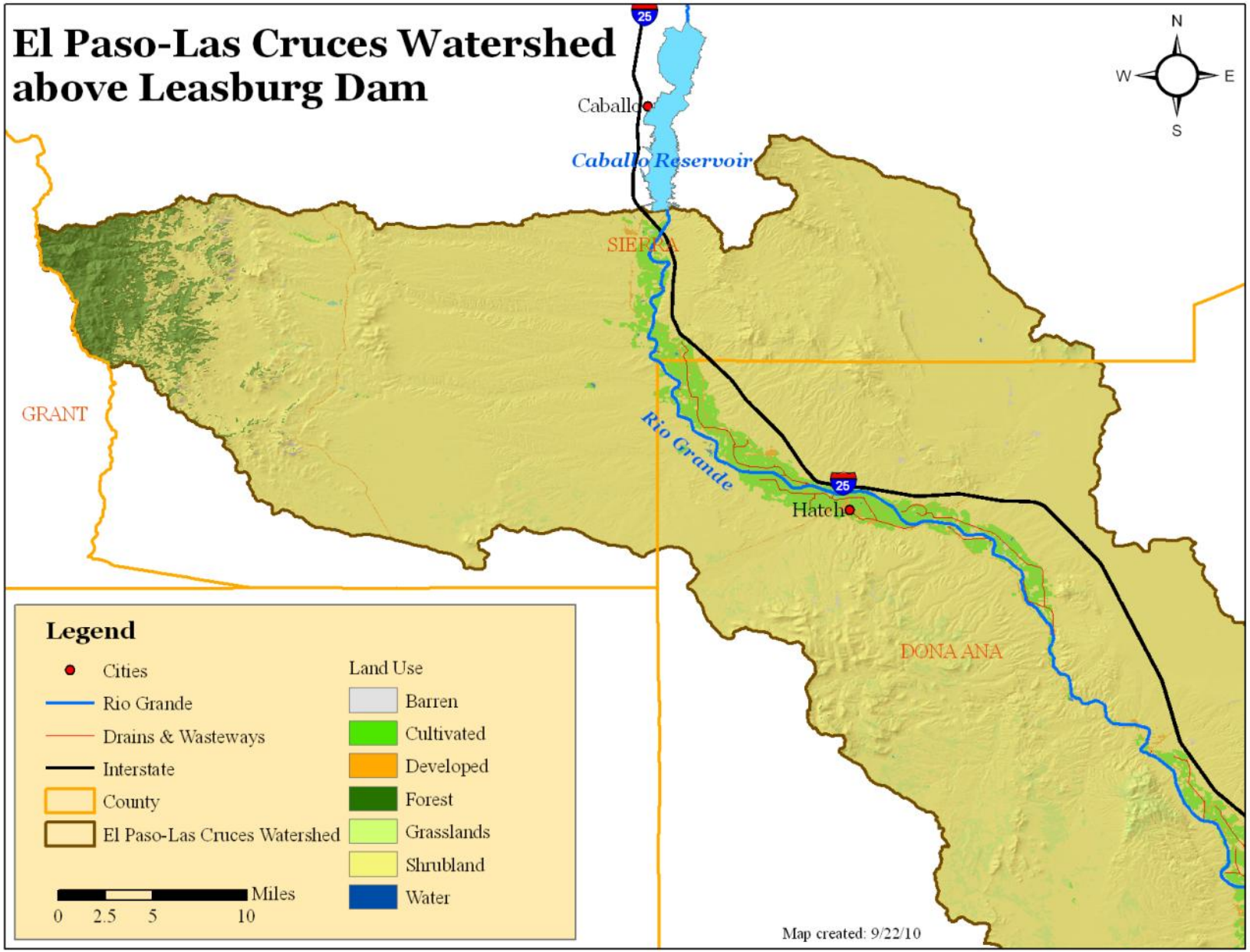
Rincon Arroyo

Photos by Brian Hanson

July 2010 storm

Phase I

- Phase I activities included data and biological analyses as well as community outreach
- Watershed Restoration Action Strategy
- Phase I conclusion: insufficient data for spatial and temporal characterization of bacteria


El Paso-Las Cruces Watershed above Leasburg Dam
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Caballo
Caballo Reservoir
SIERRA
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Rio Grande
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DONA ANA
Legend
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Drains & Wasteways
Interstate
County
El Paso-Las Cruces Watershed
Land Use
Barren
Cultivated
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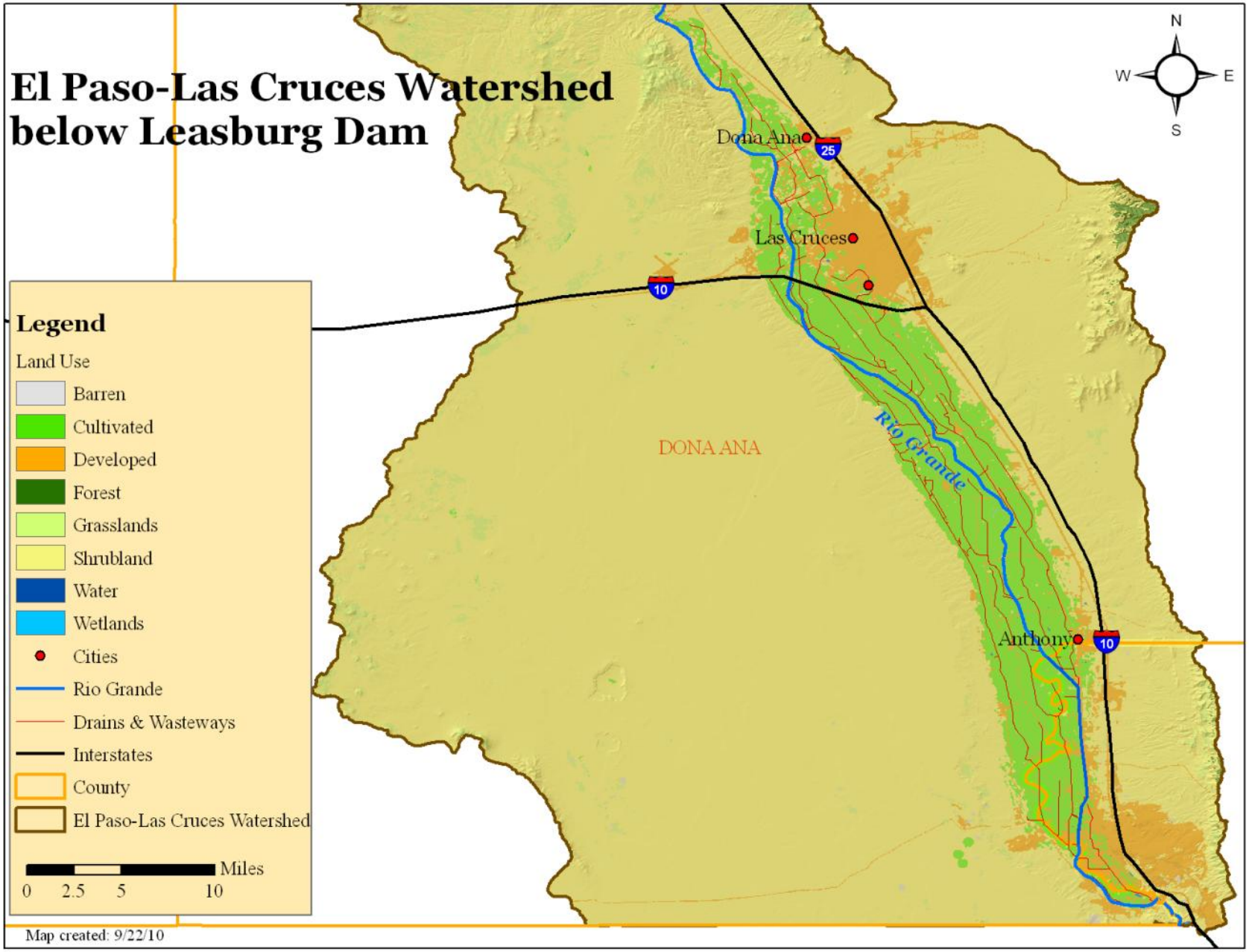
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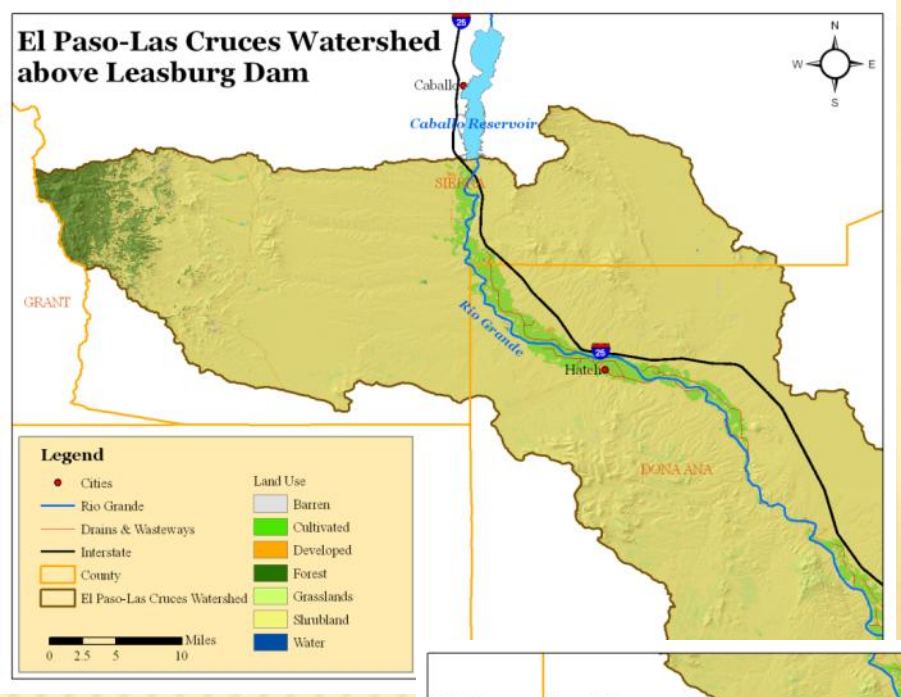
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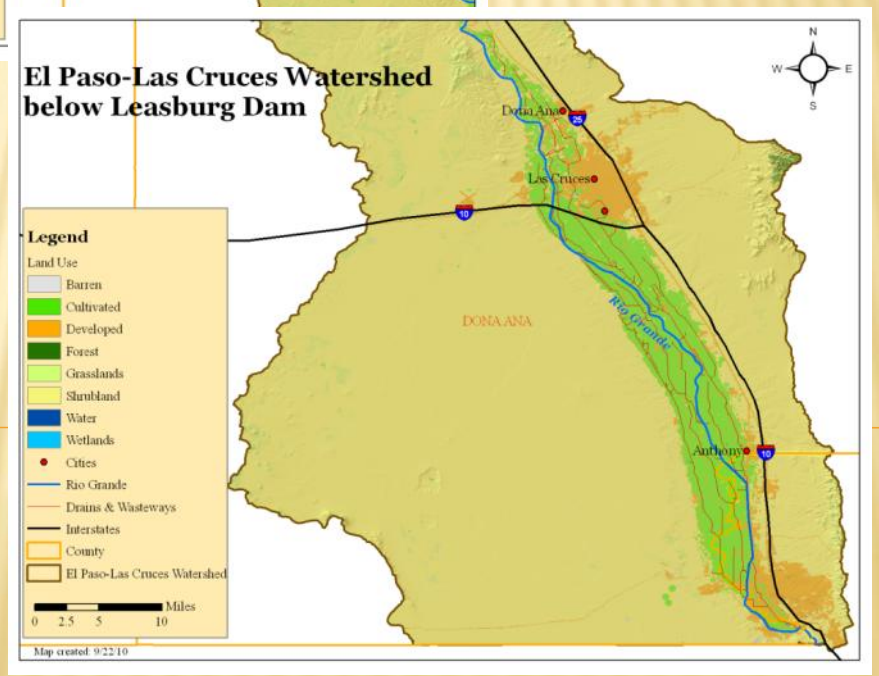
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Wetlands
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Rio Grande
Drains & Wasteways
Interstates
County
El Paso-Las Cruces Watershed
Miles
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Map created: 9/22/10

Phase I Recommendations

Water Quality Sampling Program

Continued development of BMP recommendations and long-term monitoring strategy

Continued stakeholder outreach and education

Phase II

Activities:

- Water quality sampling and monitoring program
- Bacterial source tracking study
- Data analyses
- Outreach and education program

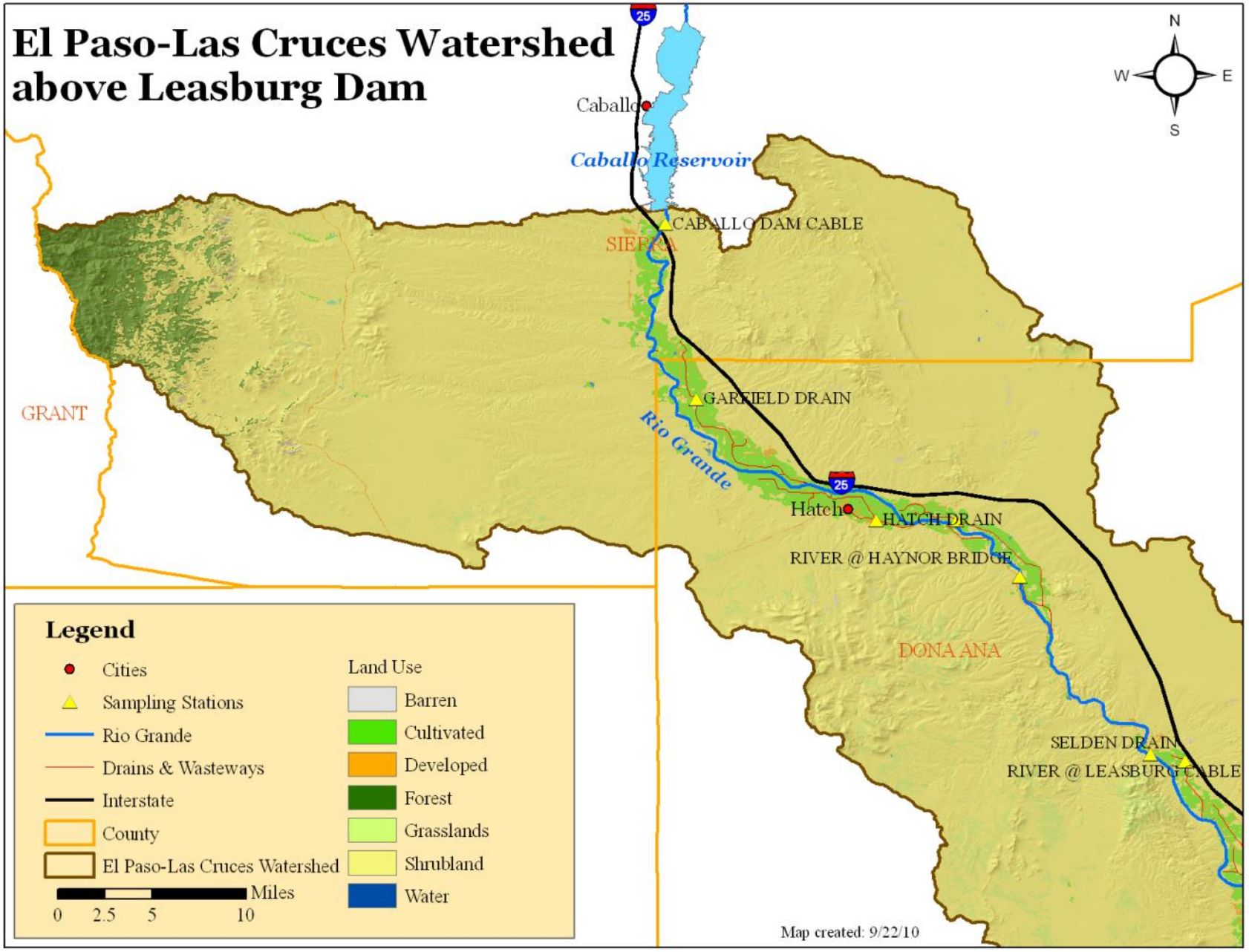
Contractors include the Elephant Butte Irrigation District, Dr. Phil King and Dr. Geof Smith of NMSU.

Brian Hanson (NMDA) is the watershed coordinator.

Element a
IDENTIFICATION OF CAUSES AND SOURCES

Multi-level approach used-

- Water quality monitoring program
- Land use analysis
- Modeling


El Paso-Las Cruces Watershed above Leasburg Dam
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Caballo Reservoir
CABALLO DAM CABLE
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Rio Grande
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Hatch
HATCH DRAIN
RIVER @ HAYNOR BRIDGE
DONA ANA
SELDEN DRAIN
RIVER @ LEASBURG CABLE
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Rio Grande
Drains & Wasteways
Interstate
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El Paso-Las Cruces Watershed
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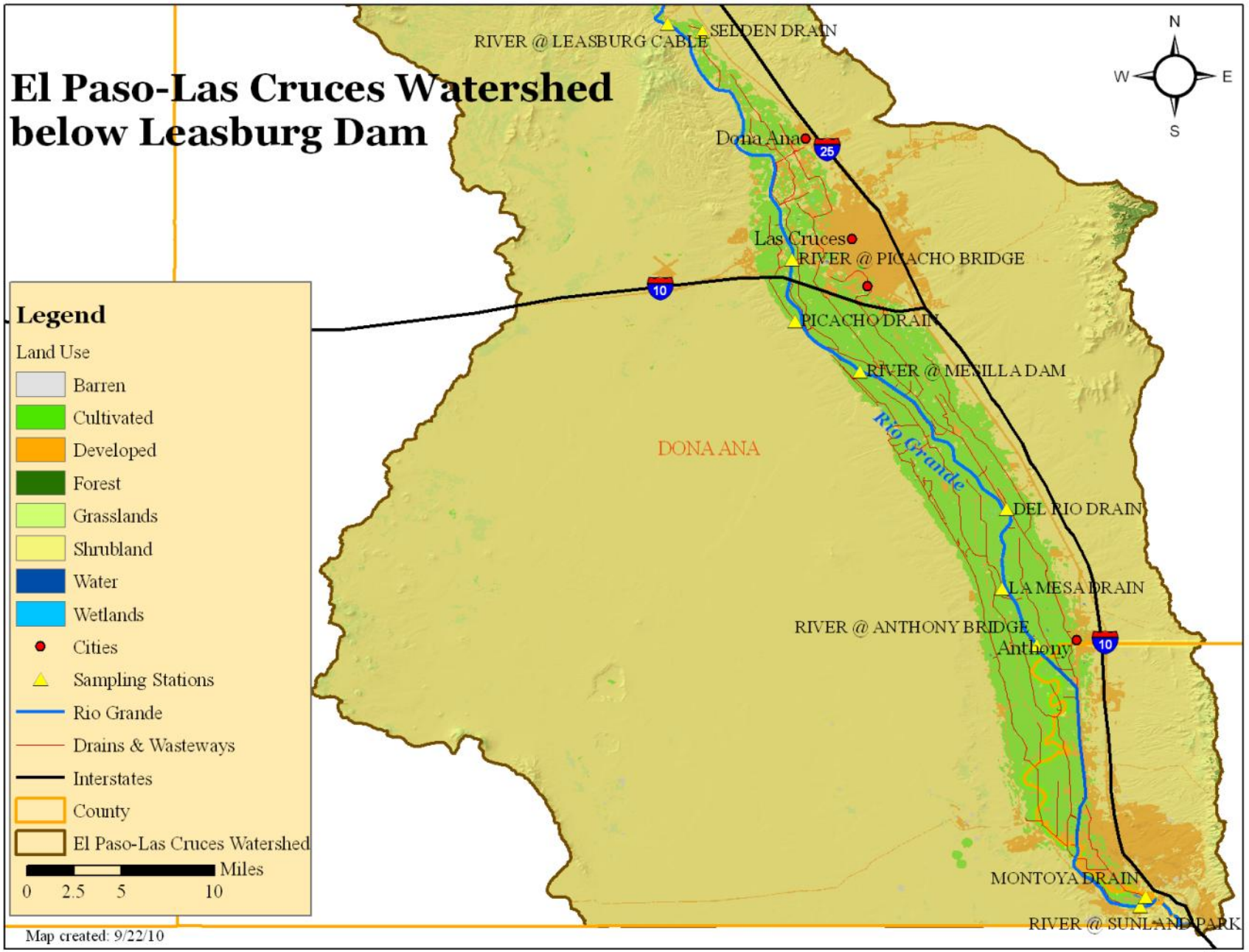
El Paso-Las Cruces Watershed
below Leasburg Dam
RIVER @ LEASBURG CABLE
SELDEN DRAIN
Dona Ana
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Las Cruces
RIVER @ PICACHO BRIDGE
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PICACHO DRAIN
RIVER @ MESILLA DAM
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Rio Grande
DEL RIO DRAIN
LA MESA DRAIN
RIVER @ ANTHONY BRIDGE
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El Paso-Las Cruces Watershed
Miles
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Map created: 9/22/10

Element a
IDENTIFICATION OF CAUSES AND SOURCES

Monitoring program consists of sampling the Rio Grande, agricultural drain return flows, and opportunistic stormwater sampling.

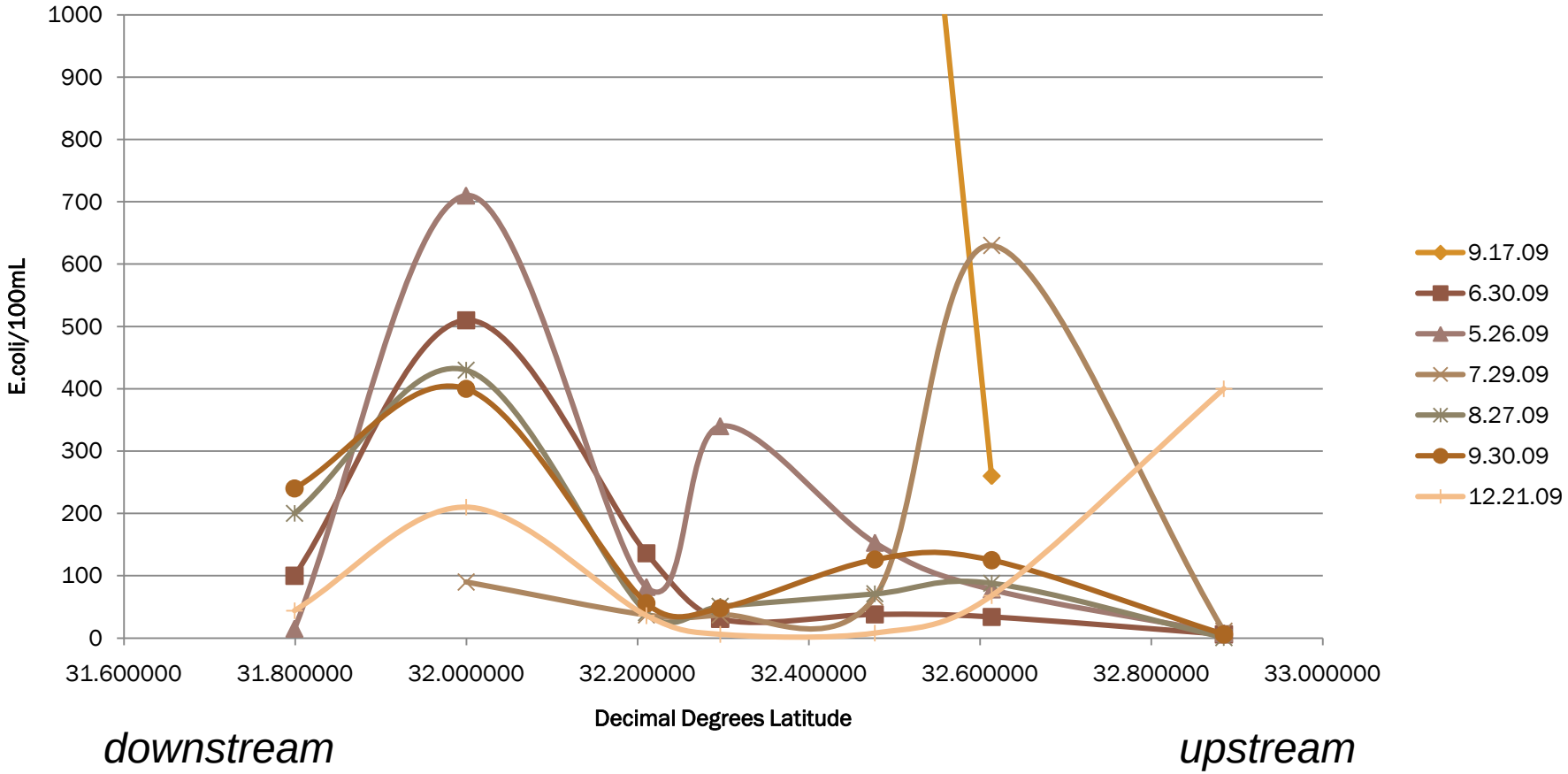
Element a
IDENTIFICATION OF CAUSES AND SOURCES

Data is being analyzed for trends looking for “hotspots”.

Identified source areas will be evaluated for land use activities.

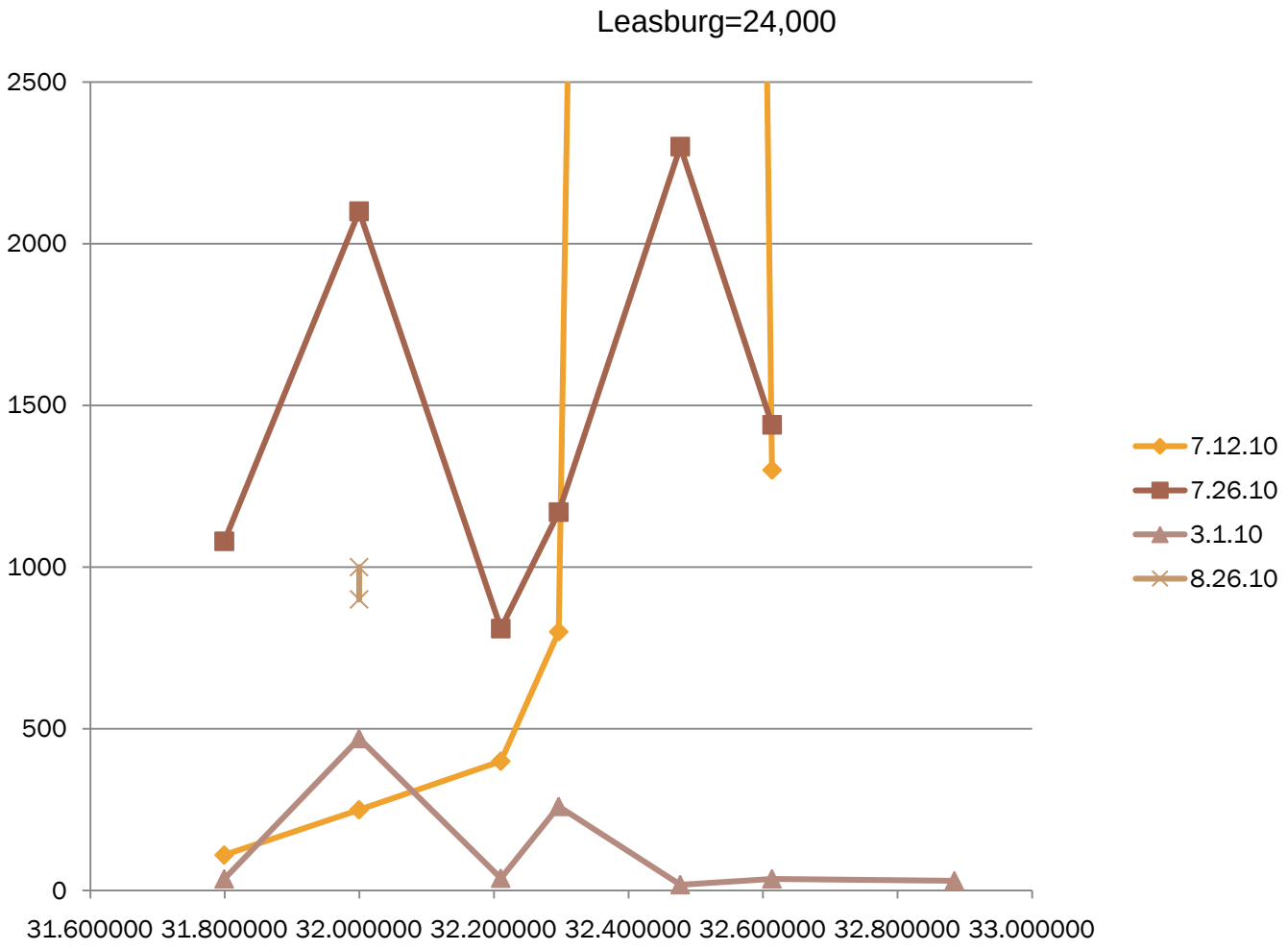
Four sites will also be chosen for microbial source tracking analysis.

2009 River Timepoints Greater than 400 E.coli/100mL

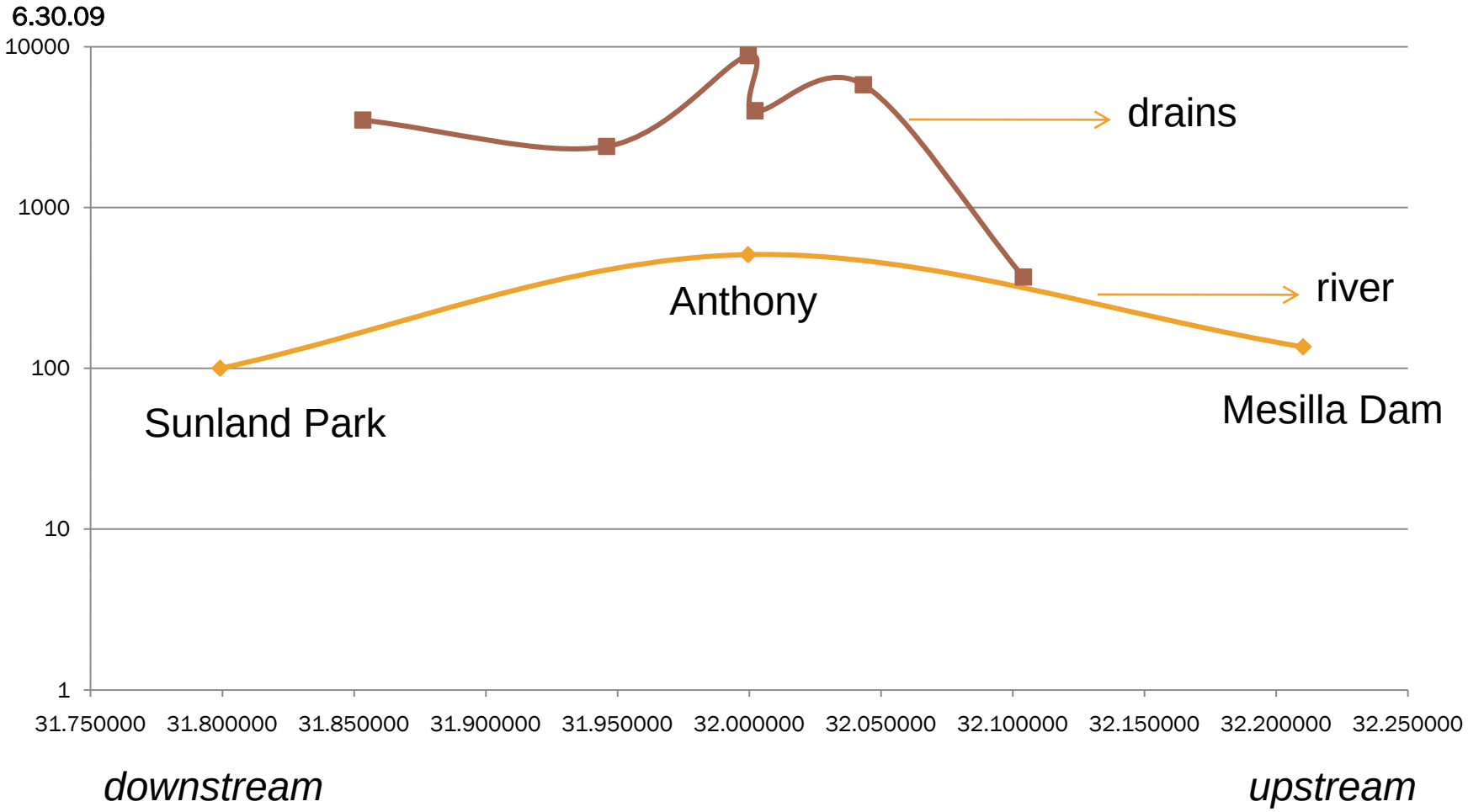


downstream *upstream*

2010 River dates where > 400 E.coli/100 mL observed



2 of 3 “peaked” at Anthony Bridge. Added duplicate samples on Aug. 26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32.250000
downstream
upstream

NEXT STEPS FOR LOWER RIO GRANDE

- Continued analysis of water quality data
- Identify two additional source tracking sites
- Land use analysis and watershed characterization
- Completing BASINS *E. coli* model analysis
- Utilizing source identification results to estimate loading and determine mitigation practices
- Continued stakeholder outreach and watershed education

References

U.S. EPA *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*

http://water.epa.gov/polwaste/nps/handbook_index.cfm

U.S. EPA Region 6

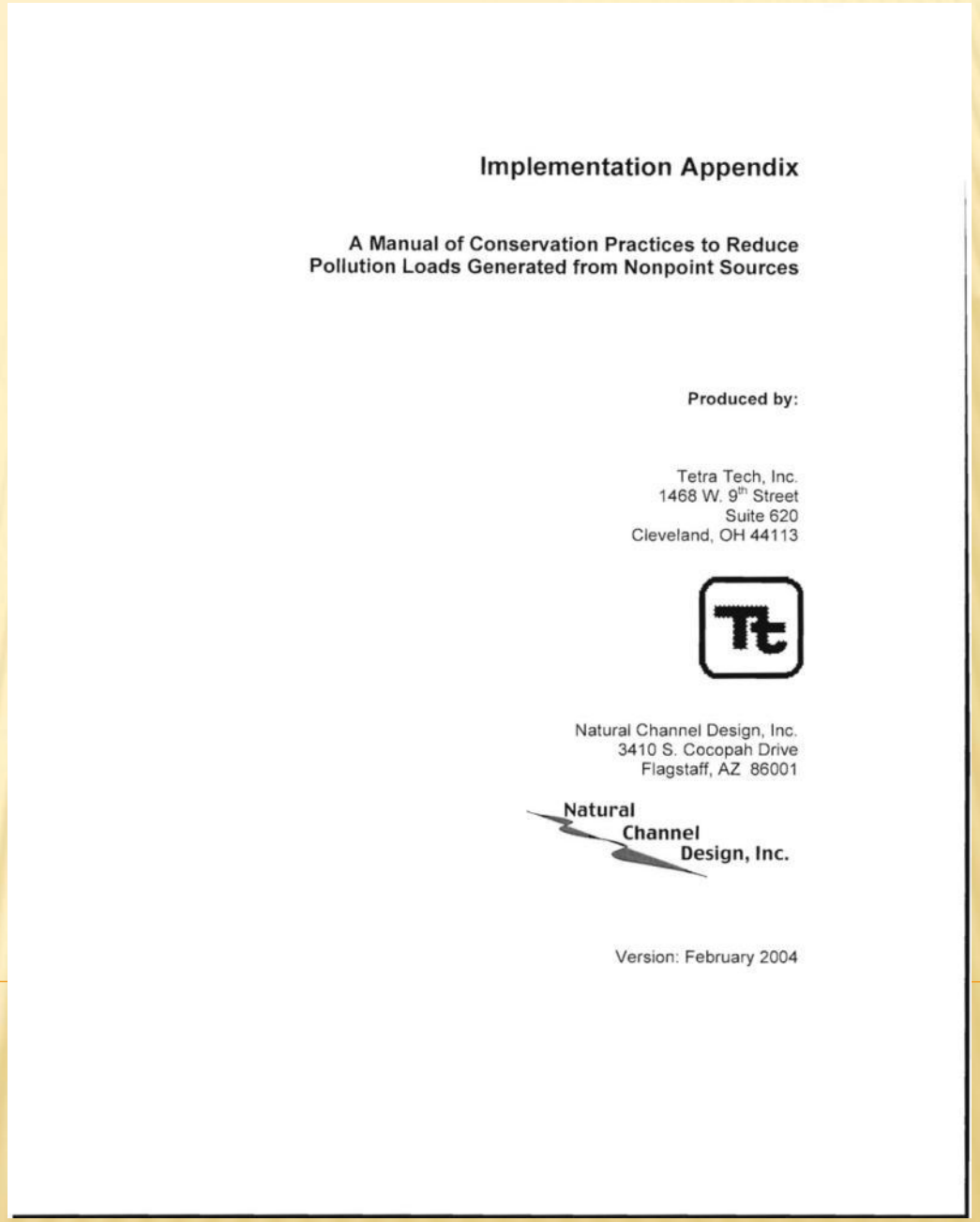
Texas Watershed Planning Short Course

May 10-14, 2010 in Bandera, Texas

Clean Water Act Section 319:
http://www.epa.gov/owow_keep/NPS/cwact.html

References

BMP Guidance



Implementation Appendix

A Manual of Conservation Practices to Reduce Pollution Loads Generated from Nonpoint Sources

Produced by:

Tetra Tech, Inc.
1468 W. 9th Street
Suite 620
Cleveland, OH 44113

Natural Channel Design, Inc.
3410 S. Cocopah Drive
Flagstaff, AZ 86001

Natural Channel Design, Inc.

Version: February 2004

Questions? Comments?

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