Big Bend Groundwater Management District #5

WELCOME!

Rattlesnake Creek Watershed Plan-Environmental Assessment Open House

BIG BEND

BARTON
PAWNEE
RICE
STAFFORD
RENO
EDWARDS
KIOWA
PRATT

G.M.D.#5

WHY ARE YOU HERE?

1

The Big Bend Groundwater Management District #5 (GMD #5) has received funding from the Natural Resources Conservation Service (NRCS) to develop a long-term plan to improve natural resource management in the watershed.

2

The information presented at this meeting will outline the NRCS funding program for the plan, describe the planning process, and describe needs (problems) that have already been identified within the watershed.

3

We need your input to fully understand existing issues in the watershed, identify new issues, and develop solutions to the problems!

PROJECT BACKGROUND: WATERSHED AND FLOOD PREVENTION OPERATIONS (WFPO) AND PL-566

The USDA Natural Resources Conservation Service (NRCS) WFPO program provides a funding mechanism for public sponsors to construct projects with the following purposes:

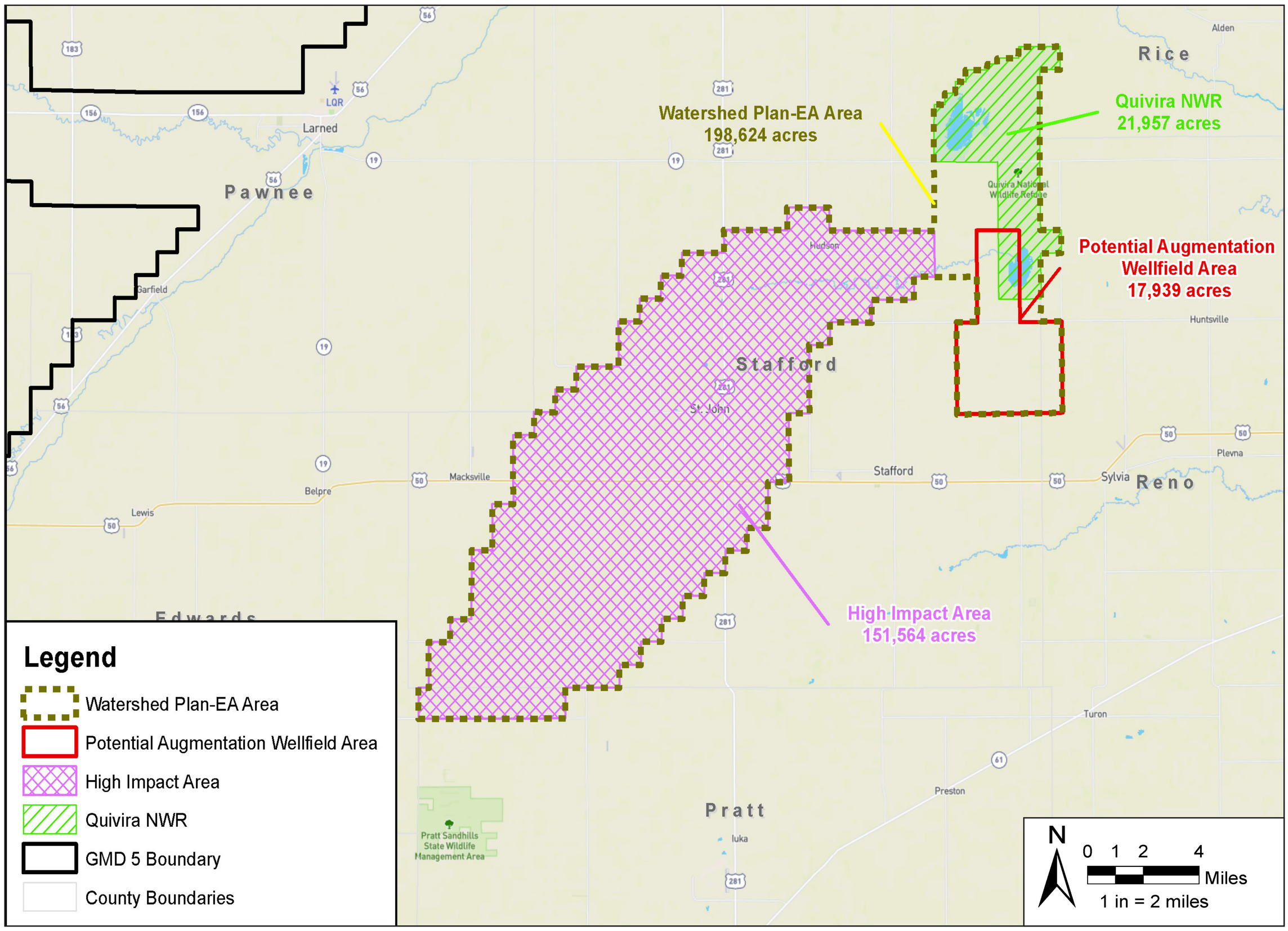
- Flood Damage Reduction
- Watershed Protection
- Public Recreation
- Public Fish and Wildlife
- Agricultural Water Management
- Municipal and Industrial Water Supply
- Water Quality Management
- Watershed Structure Rehabilitation

PL-566 refers to the Watershed Protection and Flood Prevention Act which authorizes the USDA-NRCS to help local project sponsors, like the GMD #5, plan and implement watershed projects. PL-566 watershed projects are locally led to address agricultural-related natural resource concerns in watersheds up to 250,000 acres**.**

Projects must:

- Have public sponsorship
- Provide benefits that are directly related to agriculture, including rural communities, that must account for at least 20 percent of the total project benefits.

DEVELOP A WATERSHED PLAN - ENVIRONMENTAL ASSESSMENT (PLAN-EA)



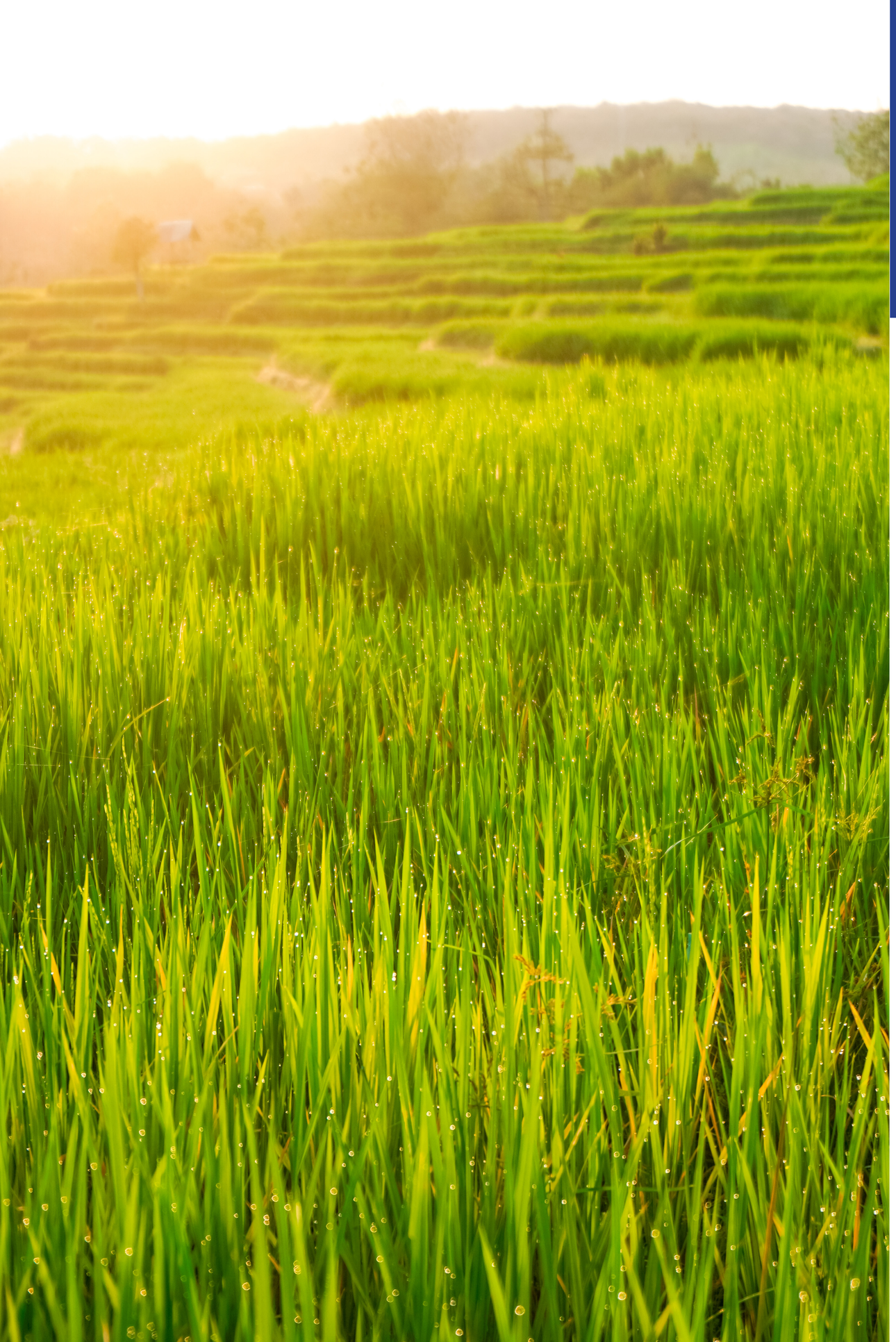
The GMD #5 has obtained NRCS WPFO funds to develop a Watershed Plan-EA.

The Purpose of the Watershed Plan-EA is to address agricultural water management.

The Needs identified by the GMD #5 are to assure a water supply for Quivira NWR and maintain the existing agricultural economy.

Potential Actions could include:

- Streamflow augmentation
- Targeted reductions in groundwater use



WHAT IS A WATERSHED PLAN-EA?

The Watershed Plan-EA will identify potential projects that would fulfill one or more of the program's authorized purposes and evaluate those projects for:

- Technical feasibility
- Economic feasibility
- Environmental feasibility

The Watershed Plan-EA must also comply with National Environmental Policy Act (NEPA) requirements:

- Resource problems to be addressed (purpose and need of the project)
- Practices to be installed (project alternatives to address the purpose and need of the project)
- Description of the project environment and potential environmental effects
- Methods of financing

Public comment and input are solicited throughout the Watershed Plan-EA process.

WHAT TYPES OF RESOURCES WOULD BE EVALUATED IN THE WATERSHED PLAN-EA?

Social

Cultural/Historical Resources

Environmental Justice

Parks and Recreational Areas

Visual Resources

Transportation Resources

Economic

Farmland

Land Use

Socioeconomics

Environmental

Wetlands and Waters

Vegetation and Wildlife

Threatened and Endangered Species

State and Federal Refuges

Hazardous Materials and Waste

SECTION 106 – NATIONAL HISTORIC PRESERVATION ACT

Section 106 of the National Historic Preservation Act requires the federal government to identify historic properties that may be affected by its undertakings; assess the impacts of the undertaking on those properties; and seek ways to avoid, minimize, or mitigate any negative effects the project may have on those properties.

NEPA also requires that an agency evaluate the effects of a project such as cultural resources and historic properties.

Archeological sites include:

- Artifact scatters (objects on ground surface such as arrowheads, “flint chips,” pottery fragments, tin cans, glass bottles, brick fragments, etc.)
- Building foundations or collapsed buildings
- Burials

Standing structures more than 50 years old include:

- Houses
- Barns
- Bridges

Other cultural resources can include:

- Culturally significant plants
- Culturally significant landscapes

If you know of any archeological sites in the study area or interesting history about your community, please share with the project team.

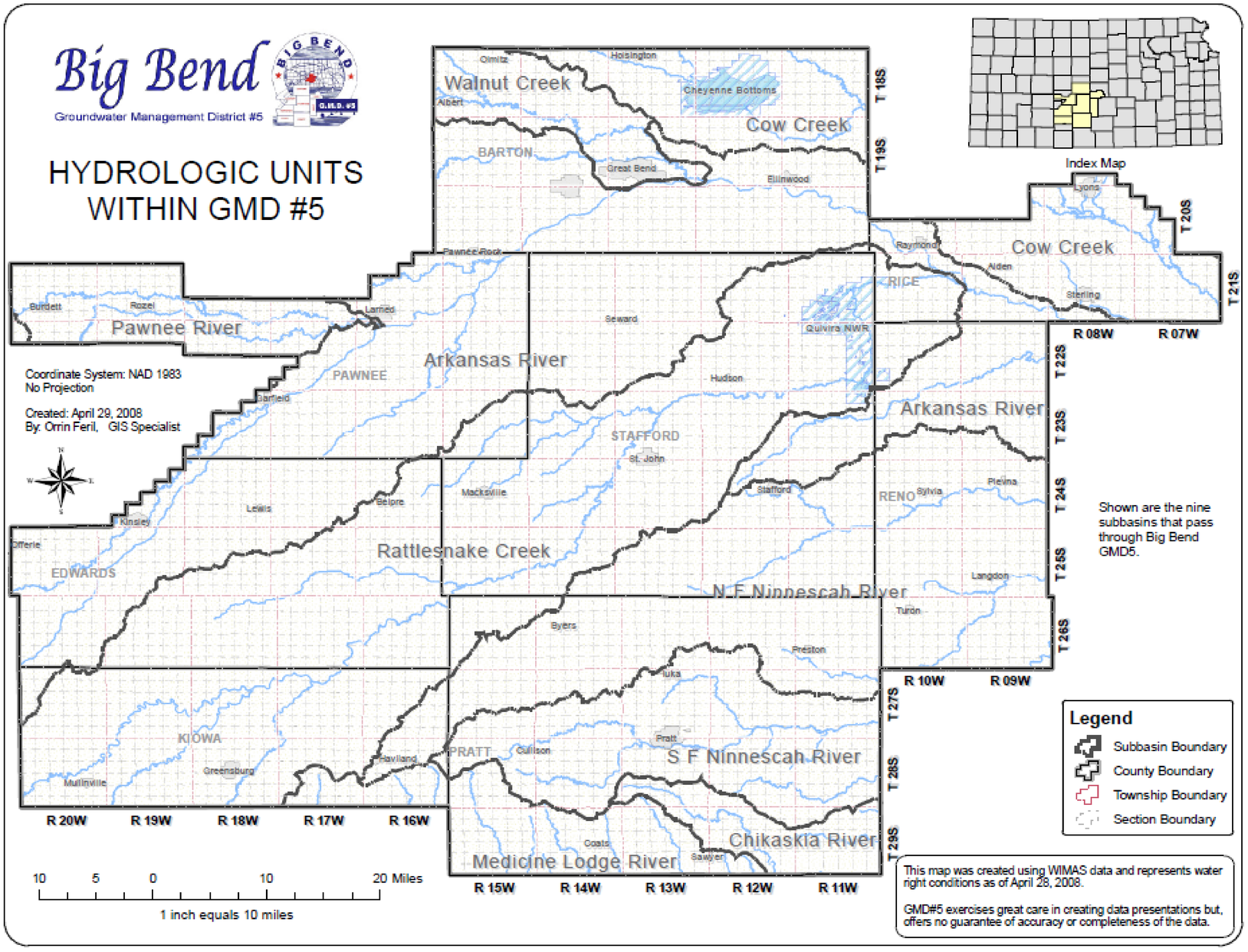
ABOUT NRCS

The Natural Resources Conservation Service (NRCS) is an agency of the United States Department of Agriculture that helps America's farmers, ranchers, and forest landowners conserve the nation's soil, water, air, and other natural resources. NRCS provides technical assistance, financial assistance, tools, and resources related to conservation.

NRCS operates the Watershed and Flood Prevention Operations (WFPO) Program to help units of federal, state, local, and tribal government (project sponsors) protect and restore watersheds.

NRCS is providing funds to the local project sponsor GMD #5 to complete the Watershed Plan-EA.

ABOUT GMD #5



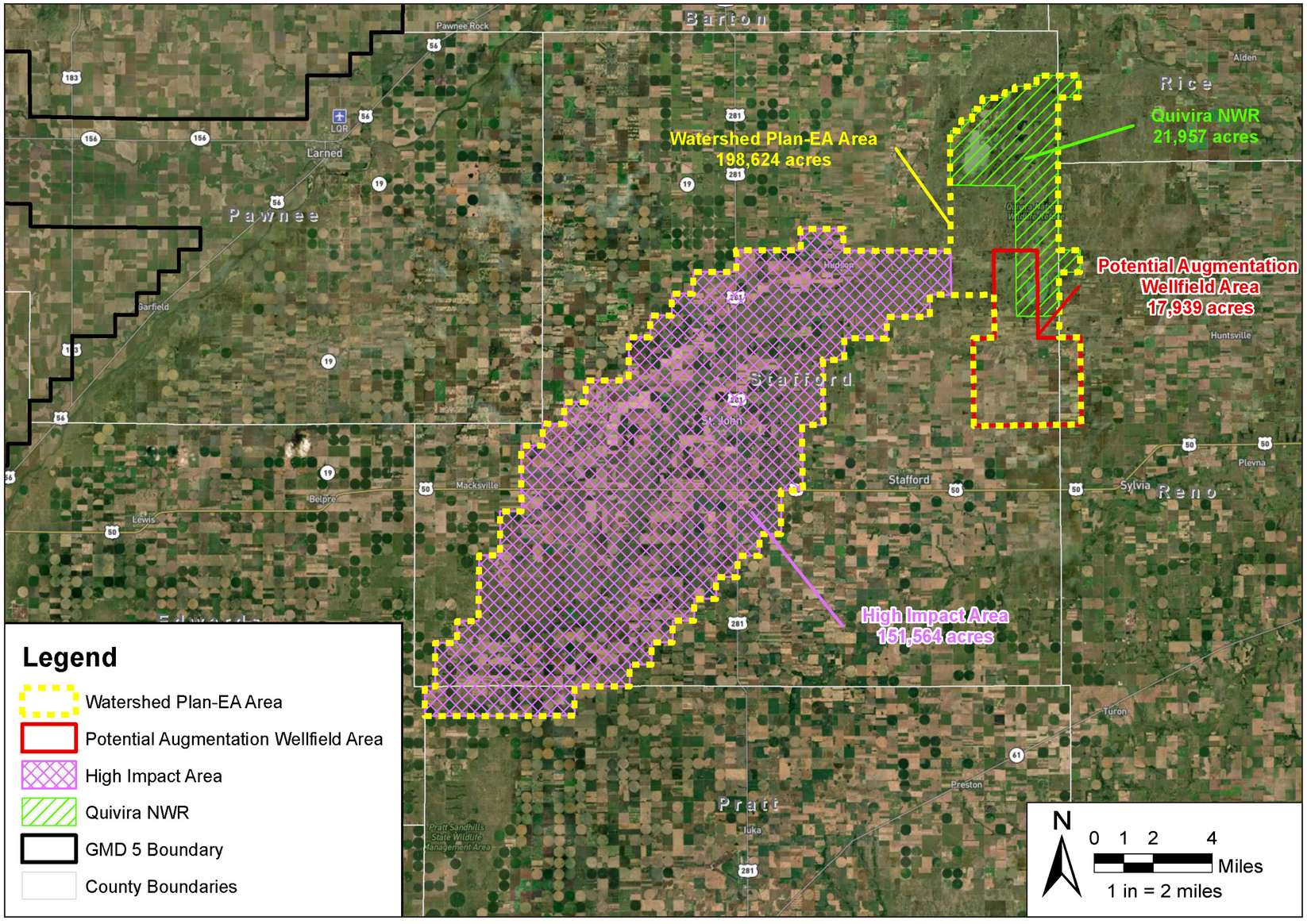
GMD #5 covers approximately 2.5 million acres, including 569,725 authorized irrgated acres. There are 4,523 water rights, with 5,459 points of diversion. The total authorized quantity these water rights can produce is 768,784 acre-feet, or 250.5 billion gallons of water, per year.
GMD #5 is the local sponsor of the Watershed Plan-EA.

Big Bend Groundwater Management District No. 5 (GMD #5) was formed in March of 1976 under the authority of Kansas Statutes Annotated 82a-1020 et seq.

The purposes of the district are:

1. Establish a data gathering bank including the measurement of water withdraw, measurement of aquifer recharge, and other pertinent information.
2. Establish a water quality monitoring program.
3. Discourage waste of water.
4. Develop an educational program on optimum water use.
5. Develop well spacing criteria.
6. Encourage accurate production measurements.
7. Promote tail-water pits.
8. Exert action to prevent water pollution.
9. Review replacement wells.
10. Review and authorize annual appropriation of water usage.
11. Investigate alternate points of diversion.
12. Explore and develop artificial recharge.
13. Provide advice and assistance in the management of drainage problems and surface water.

WATERSHED PLAN-EA PROJECT AREA



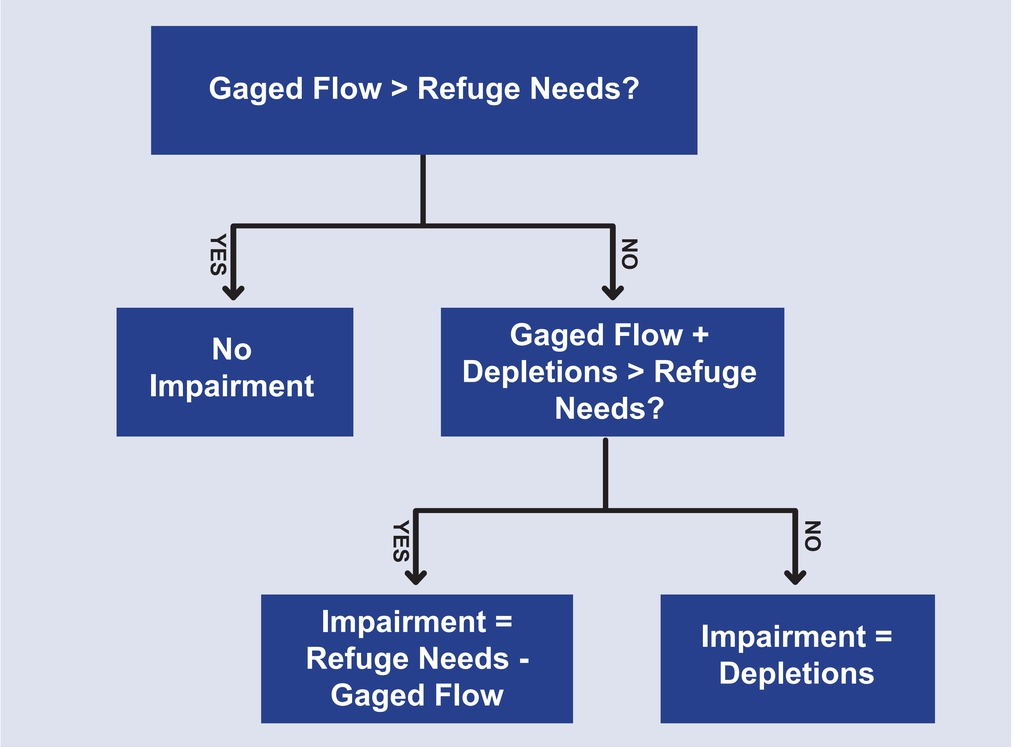
The project area:

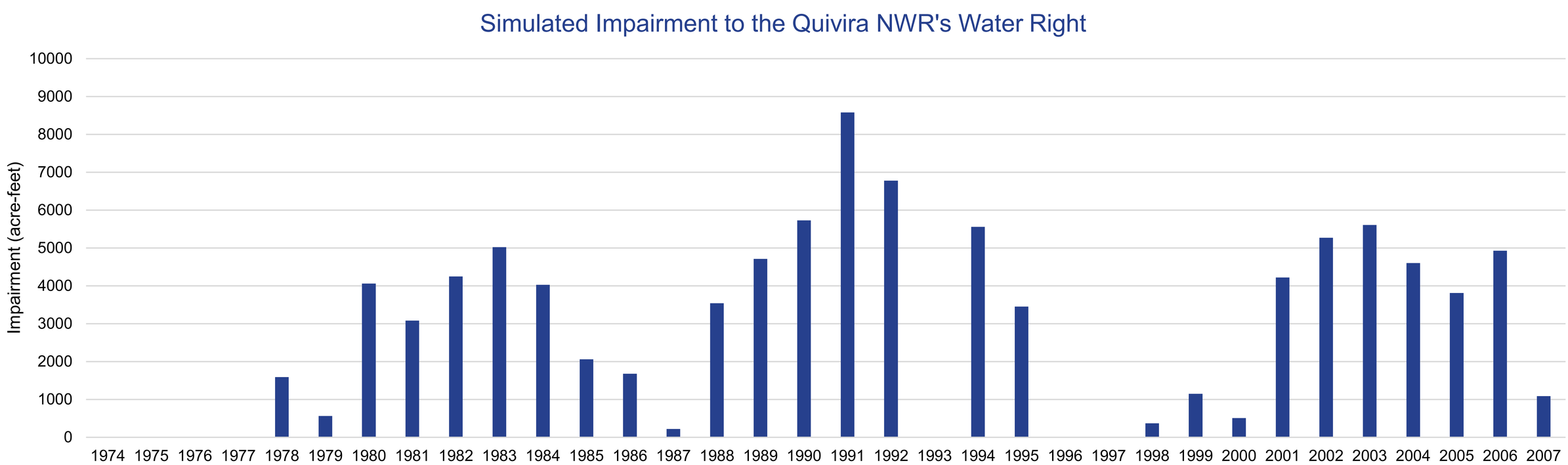
- Includes 198,624 acres.
- Encompasses the High Impact Area, Quivira NWR, and the potential augmentation wellfield area.
- The High Impact Area is defined as the area where 40% or more of the groundwater pumping results in a depletion to streamflow as determined by the GMD #5 Model.

THE PROBLEM

Water supplies for the Quivira National Wildlife Refuge (NWR) fluctuate. Flows at the Zenith stream gage upstream of Quivira NWR show the variability in available water through time. The Watershed Plan-EA will seek a project that increases streamflow available to the Quivira NWR.

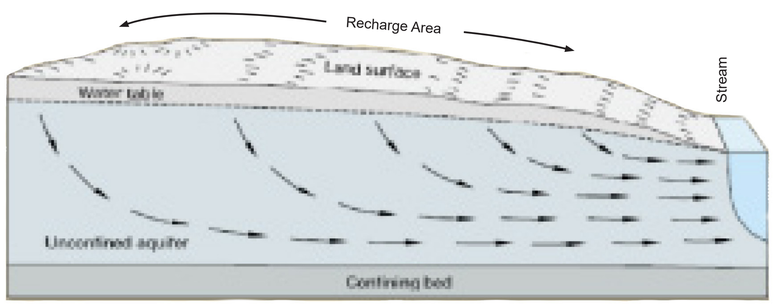
When needs at Quivira NWR are greater than supplies at the Zenith gage, impairment can occur. The U.S. Fish & Wildlife Service holds a water right that is senior to many groundwater users in the watershed. Using the GMD #5 groundwater model, depletions to the river due to groundwater pumping were determined and are factored into the historical gaged streamflows. To determine historical simulated impairment at Quivira NWR, Kansas Department of Agriculture - Division of Water Resources used this flow chart to the right:

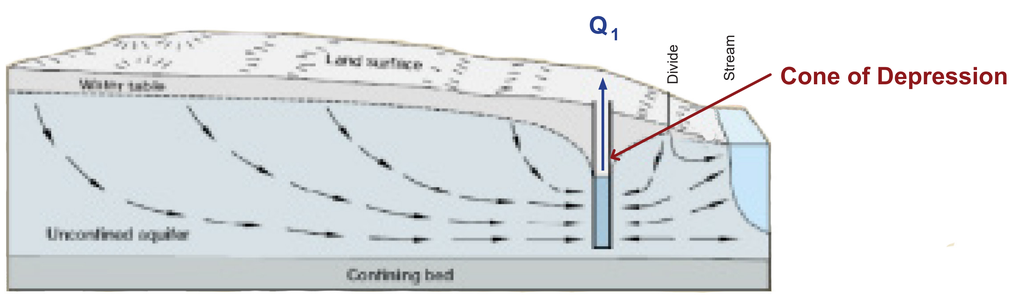


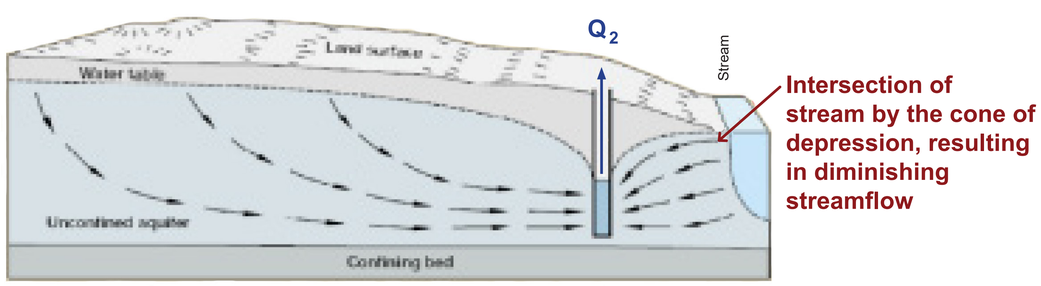


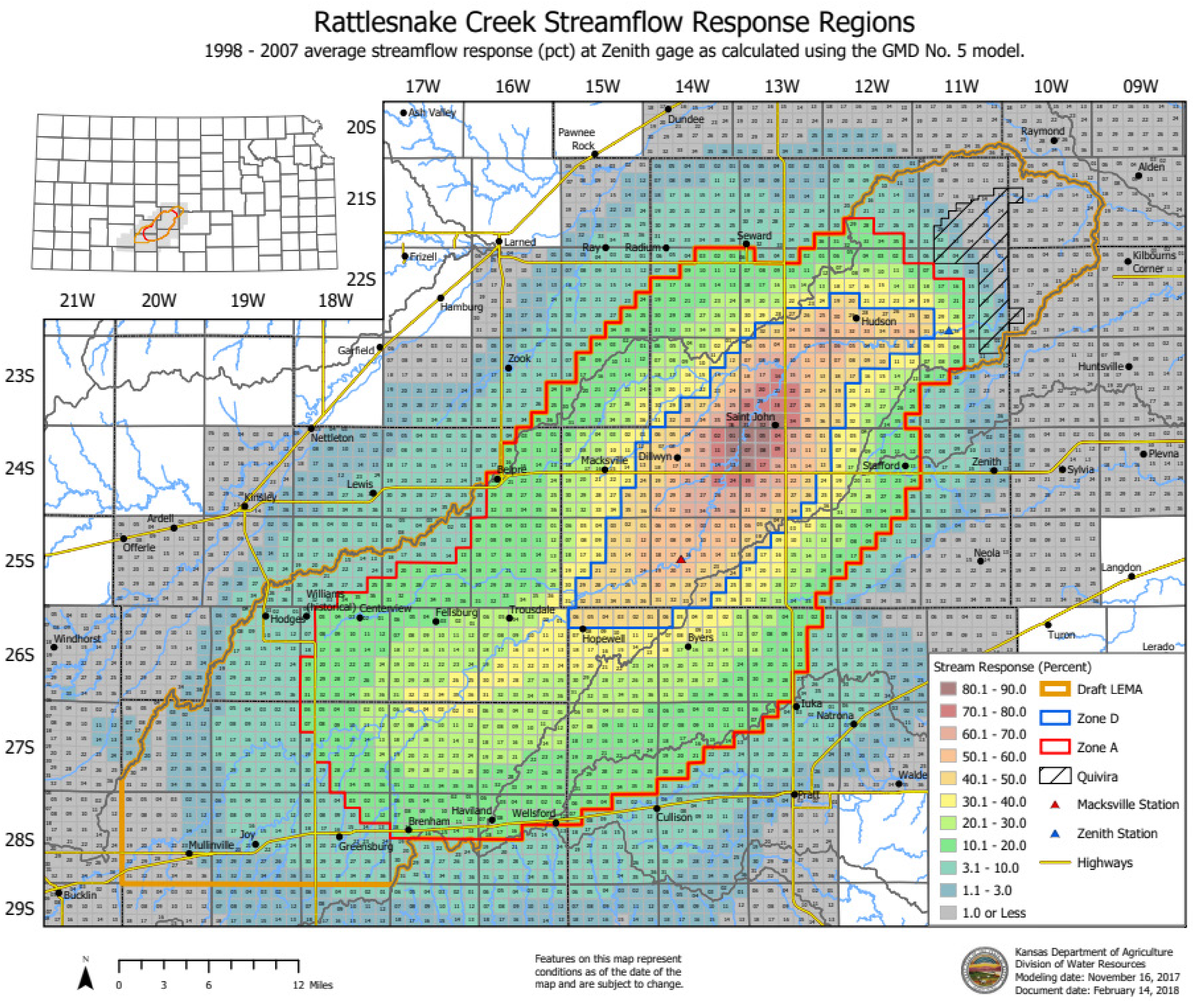
THE EFFECT OF GROUNDWATER PUMPING ON STREAMFLOW

Groundwater pumping in the Rattlesnake Creek watershed has an impact on streamflow. The impact an irrigation well has on streamflow can be approximated using a groundwater model. Relative impact is determined by the well's proximity to the stream and aquifer properties.





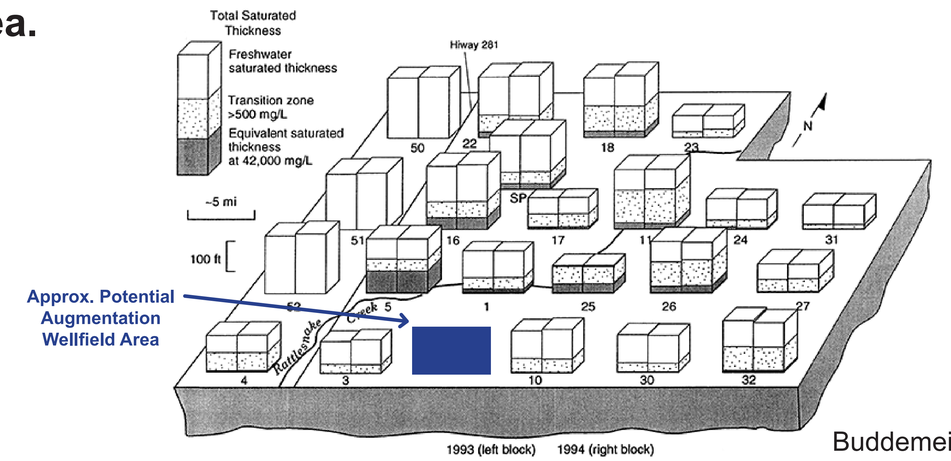




The figure above shows the average stream response at Zenith gage to groundwater pumping by section throughout the previously proposed Local Enhanced Management Area (LEMA) and vicinity. Sections shaded red indicate that pumping in these areas will have higher impacts to the stream than pumping in sections shaded green.

FEASIBILITY OF STREAMFLOW AUGMENTATION USING GROUNDWATER

Water quality and quantity of the Great Bend Prairie Aquifer in eastern GMD #5 has been studied for decades, and is generally well understood on a regional level. However, data is scarce in the immediate vicinity of the potential augmentation wellfield area.

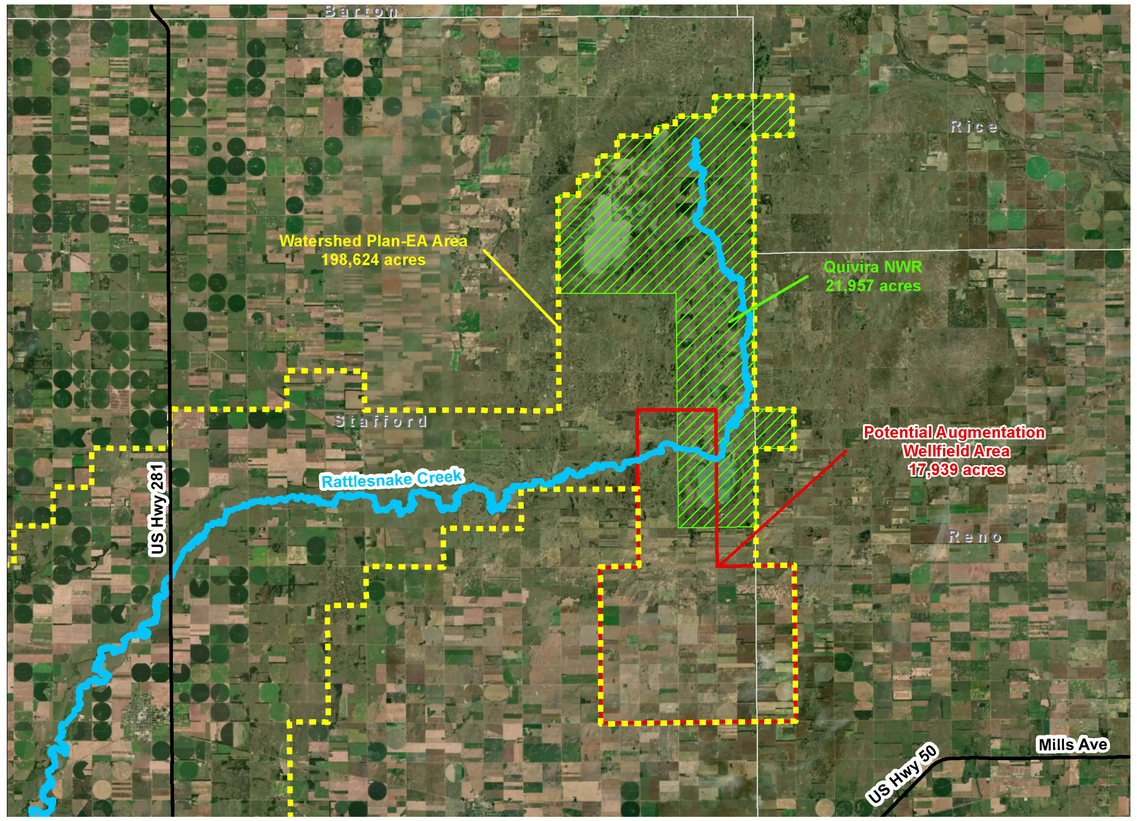


Buddemeier, 1994

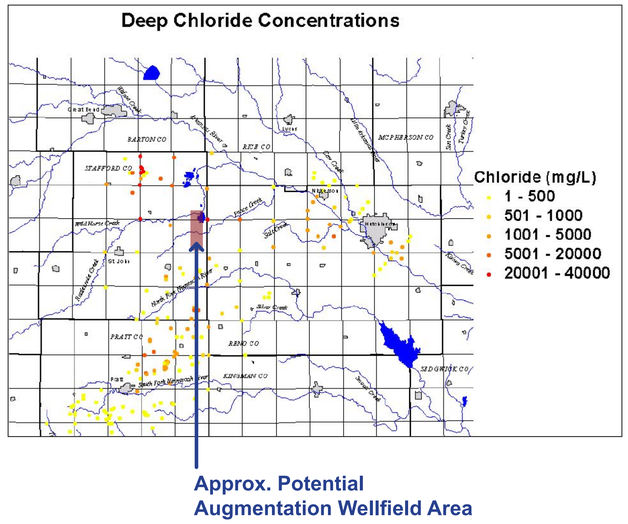
The Watershed Plan-EA will evaluate the feasibility of using groundwater to augment streamflow to the Quivira NWR. In the process of determining feasibility, additional data on water quality and quantity will be collected to provide a better local understanding.

Questions that will be addressed include:

- Will the use of an augmentation wellfield displace poor-quality water from deeper in the aquifer?
- What would be the potential impacts of an augmentation wellfield to the surrounding landowners and groundwater users?
- What is the quality of the water pumped from an augmentation wellfield? Specifically, how saline?
- What are the water quality and hydrologic effects to the aquifer, area wells, Quivira NWR, and surface water features if an augmentation wellfield were used?



Kansas Department of Health and Environment has suggested the following condition on any augmentation supply: "Augmentation water supply must not exceed ***1400 mg/l*** of chloride and any combination of augmentation water supply with ambient streamflow measured on Rattlesnake Creek at the Zenith gaging station must similarly have a chloride content below 1400 mg/l prior to being diverted into Little Salt Marsh while augmentation is occurring."

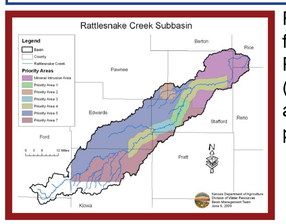


HISTORY OF COMMUNICATION BETWEEN GMD #5, US FISH & WILDLIFE SERVICE, AND THE STATE OF KANSAS REGARDING QUIVIRA NATIONAL WILDLIFE REFUGE

1993

1993-2012

Rattlesnake Creek/Quivira Partnership was formed and operated by GMD #5, Water Protection Association of Central Kansas (WaterPACK), KDA-DWR, and USFWS to develop and implement solutions to water resource problems within the subbasin.



2008

2010

2008-2010

GMD #5 Groundwater Model developed by Balleau Groundwater Inc. to incorporate historical pumping, water levels, streamflow, aquifer properties, recharge, and evapotranspiration data.

2011

2012

2013

April 2013

The USFWS filed an impairment complaint with KDA-DWR, requesting investigation and action.

2014

2015

April 2013-2015

Impairment investigation conducted by KDA-DWR.

July 2015

Governor Brownback signed into law a provision to "allow augmentation for the replacement in time, location and quantity of the unlawful diversion, if such replacement is available and offered voluntarily."

2016

July 2016

USFWS rejected GMD #5's stakeholder proposal.

September 2016

GMD #5 stakeholders presented a proposal to the USFWS for an augmentation wellfield to supplement streamflow to the Refuge.

December 2016

Final Report on Impairment Investigation issued by the Chief Engineer David Barfield.

2017

February 2017

GMD #5 issued their second stakeholder proposal including additional details on augmentation wellfield alternatives.

April 2017

USFWS determined that augmentation alternatives proposed by GMD #5 in their second stakeholder proposal did not adequately address impairment.

July 2017

KDA-DWR presented GMD #5 with a strict administrative option as the remedy for impairment.

August 2017

GMD #5 proposed to pursue a Local Enhanced Management Area (LEMA) to address the remedy including consideration of end gun removal, augmentation implementation, and the transfer of water out of sensitive areas.

2018

February 2018

Chief Engineer David Barfield presented the impairment remedy requirements at the GMD #5 annual meeting.

Balleau Engineering presented on the goals and objectives of the Rattlesnake Creek Local Enhanced Management Area (LEMA).

2019

February 2019

LEMA submitted to the Chief Engineer.

July 2019

Chief Engineer issued a formal response to the LEMA, stating that the plan failed to meet statutory requirements.

October 2019

Public meeting held in St. John to discuss the Quivira impairment and explain possible solutions to the impairment.

2020

July 2020

Memorandum of agreement signed between GMD #5 and USFWS which outlines a work plan for short and long term projects to address impairment at Quivira.

2021

September 2021

GMD #5 contracts with Olsson to complete a Watershed Plan-EA with funding from the NRCS

WATERSHED PLAN-EA TIMELINE

WE ARE HERE

Planning & Feasibility Study (1-2 Years)

Design (2-3 Years)

Construction (2-5 Years)

Collect information
January 2022

Develop alternatives
Winter 2021/2022

Present draft plan
Fall/Winter 2022

Finalize plan
Spring 2023

- Public Open House Meetings

PUBLIC INPUT

We want to hear from you!
Do you have ideas for how to improve agricultural water supply, and fish and wildlife habitat?

HOW TO MAKE FORMAL COMMENTS

Fill out a comment form with your feedback

Written comments are to be submitted by January 31, 2022 to:

Stacey Roach
601 P Street, Suite 200
Lincoln, NE 68508
sroach@olsson.com
402-458-5042

Information regarding the watershed planning process and development of the Watershed Plan-EA is available on the project website at *gmd5.org/watershed-plan.*