

BOIS D'ARC LAKE WATERSHED PROTECTION PLAN

Bois d'Arc Lake Watershed Partnership Meeting

July 21, 2021

9:00 AM

Derrell Hall Education Center

NORTH TEXAS MUNICIPAL WATER DISTRICT



BOIS D'ARC LAKE WATERSHED PROTECTION PLAN

The Purpose of the Bois d'Arc Lake WPP is to…

- Identify current and potential sources of water pollution in the Bois d'Arc Lake watershed
- Encourage a voluntary and community-driven partnership focused on protecting and enhancing water quality in the watershed
- Identify and recommend specific management measures that will protect and improve water used for drinking, recreation and aquatic habitat for wildlife
- Facilitate the pursuit of federal nonpoint source program grant funds and other financial and technical assistance programs to support implementation of the plan



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The Goal of Today's Meeting is to…

- Define and begin the planning process
- Outline the framework for the Bois d'Arc Lake Partnership
- Introduce the Watershed Characterization



Bois d'Arc Lake – May, 2021

NORTH TEXAS MUNICIPAL WATER DISTRICT



BOIS D'ARC LAKE WATERSHED PROTECTION PLAN

Agenda

- Steps in Watershed Planning
- Organization of the Stakeholder Group (Bois d'Arc Lake Watershed Partnership)
- Partnership Ground Rules
- Watershed Characterization
- Next Steps

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BOIS D'ARC LAKE WATERSHED PROTECTION PLAN

Steps in Watershed Planning



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Steps in the Watershed Planning Process

Step 1 – Establish a partnership

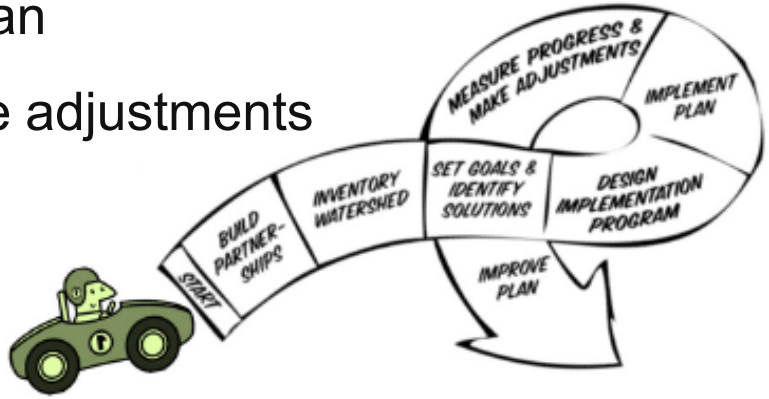
Step 2 – Characterize the watershed

Step 3 – Set goals and identify solutions

Step 4 – Design an implementation program

Step 5 – Implement the watershed plan

Step 6 – Measure progress and make adjustments



Each step relies on local stakeholder input and participation

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Step 1. Establish a Watershed Partnership

- Identify key stakeholders
- Identify issues of concern
- Set preliminary goals
- Develop indicators for determining water quality
- Solicit and encourage public participation in the process



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Step 2. Characterize the Watershed

- Gather existing data
- Create a Watershed inventory
- Identify data gaps
- Collect additional data if needed
- Analyze data
- Identify causes and sources of impairments
- Estimate pollutant loads



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Step 3. Set Goals and Identify Solutions

- Develop indicators & targets
- Determine load reductions needed
- Identify critical areas in the watershed
- Develop management measures to achieve goals



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Step 4. Design an Implementation Program

- Develop an implementation schedule
- Develop milestones to track implementation
- Develop criteria to measure progress
- Develop a monitoring program
- Develop information and education programs
- Develop an evaluation process
- Identify technical and financial assistance needed



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Step 5. Implement the Watershed Protection Plan

- Pursue technical and financial assistance to meet WPP goals
- Implement management strategies
- Conduct water quality monitoring
- Conduct information and educational activities

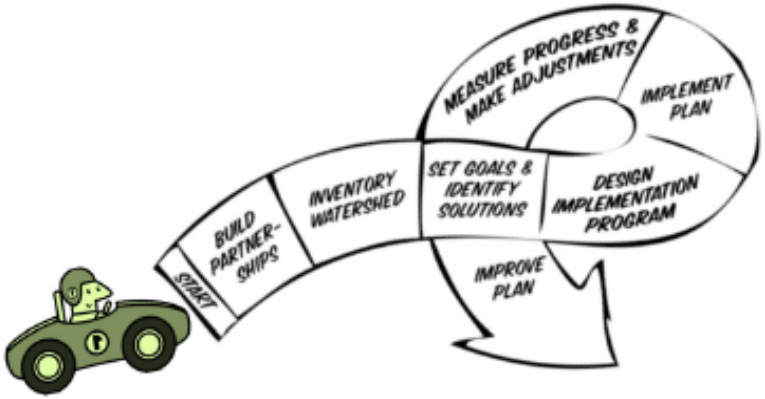
Upon acceptance of the watershed protection plan by EPA, the voluntary management measures may be eligible for funding through grants from federal and state 319(h) nonpoint source programs and other sources.



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Step 6. Measure Progress and Adjust

- Review and evaluate new information
- Track Progress and report back to stakeholders
- Make adjustments as necessary





BOIS D'ARC LAKE WATERSHED PROTECTION PLAN

Bois d'Arc Lake WPP Outline

Chapter 1 – Watershed Management

Chapter 2 – Overview of the Watershed

Chapter 3 – Bois d'Arc Lake Watershed Partnership

Chapter 4 – Methods of Analysis

Chapter 5 – Pollutant Source Assessment

Chapter 6 – Management Measures

Chapter 7 – Measures of Success

Chapter 8 – Project Implementation

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Organization of the Bois d'Arc Lake Watershed Partnership



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Bois d'Arc Lake Watershed Partnership

- **Successful development and implementation of a watershed plan depends on stakeholder participation**
- Stakeholders provide local knowledge
  - Know the watershed
  - Know what works, what doesn't
- Stakeholders represent:
  - Multiple users with varying needs
  - From the entire watershed (Not required to live in the watershed)



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Bois d'Arc Lake Watershed Partnership

- A stakeholder is anyone who:
  - Makes and implements decisions
  - Is affected by those decisions
  - Participates in the planning process
  - Assists with implementation
  - Don't have to live in the watershed to be a stakeholder



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Bois d'Arc Lake Watershed Partnership

Stakeholders represent multiple users with varying needs from throughout entire watershed

WPP stakeholder groups are typically made up of:

- Residents & landowners
- County & city representatives
- Soil and water conservation districts
- Business & industry
- Community service organizations
- Environmental & conservation groups
- Non-governmental organizations
- Universities, colleges and schools
- Irrigation districts
- Religious organizations



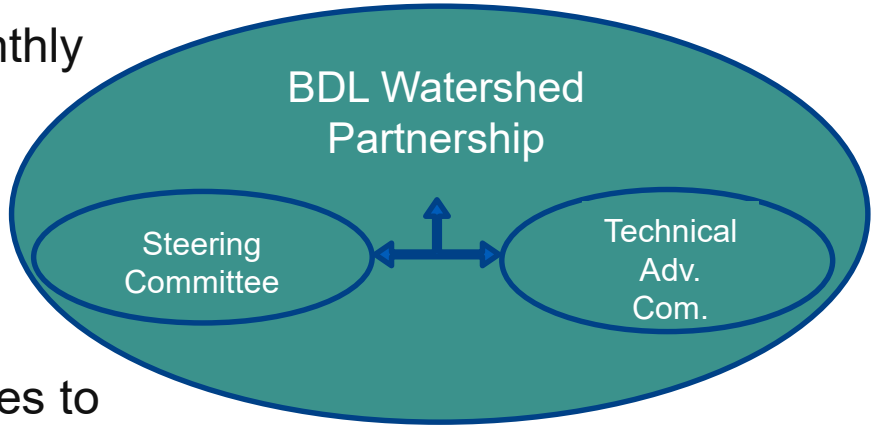
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Bois d'Arc Lake Watershed Partnership

The Partnership serves as a public and transparent forum for the planning process.

Stakeholders can participate by:

- Attending and participating in monthly partnership meetings
- Serving as a Steering Committee member – decision making body
- Serving on the Technical Advisory Committee – State/federal agencies to assist with technical tasks and resources





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Steering Committee

- Represents major stakeholder groups and interests in the community (e.g. Ag producers, representatives from government, industry, schools etc.)
- Decision-making body for the Partnership with input from other stakeholders
- Decides watershed goals and management measures most likely to achieve the goals



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Steering Committee

Initial solicitation of individuals to serve on the Steering Committee was conducted using three methods:

- Consultation with County Extension Agents, Local SWCDs, and local and regional governments
- Meetings with various stakeholder groups and individuals
- Nominations at public meetings



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Proposed Bois d'Arc Lake WPP Steering Committee

Stakeholder Representation	Name	Affiliation
Agriculture	Ronny Hart	Fannin SWCD
Business	Stuart Hall	Frontier Properties
County	Judge Randy Moore	Fannin County
County (Alt)	Com. Jerry Magness	Fannin County
Education/Rancher	Nathan Melson	Education
Landowner	Albert Pardo	Citizen
Municipality	Lance Capehart	City of Bonham
Municipality	Claude Caffee	Honey Grove
Nonprofit Org.	Lee Ellis	Bonham EDC



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Bois d'Arc Lake WPP Partnership Ground Rules



BOIS D'ARC LAKE WATERSHED PROTECTION PLAN

Bois d'Arc Lake WPP Partnership Ground Rules

- Ground Rules for the Bois d'Arc Lake Watershed Partnership are intended to address:
  - Role of the Steering Committee
  - Decision making process
  - Representativeness
  - Replacements, additions, alternates, and proxies
  - Time frame for the project



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Bois d'Arc Lake WPP Partnership Ground Rules

Role of the Steering Committee

- Serves as the decision making body for the Partnership
- Prioritizes management practices to achieve goals
- Identifies insights and concerns from a community, environmental, or public interest perspective
- Identifies the desired water quality conditions and measurable goals
- Communicates information about the WPP to others
- Has discretion to form standing and ad hoc workgroups to carry out specific assignments.



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Bois d'Arc Lake WPP Partnership Ground Rules

Decision-Making Process

- Strive for consensus when making decisions and recommendations.
- Consensus is defined as everyone being able to live with the decisions made (inherently requires compromise and negotiation)
- If consensus cannot be reached, decisions will be made by a simple majority vote.
- In order to conduct business, the Committee will have a quorum, defined as at least 51% of the SC (and/or alternates) present and a representative of NTMWD.



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Bois d'Arc Lake WPP Partnership Ground Rules

Steering Committee Representativeness

- The membership shall strive to achieve geographic and topical representation.
- The Steering Committee may add new members if:
  - A member is unable to continue serving and a vacancy is created or important stakeholder interests are identified that are not represented by the initial membership.
  - Any new member must be approved by a majority of existing members.



Bois d'Arc Lake WPP Partnership Ground Rules

Alternates

- Members unable to attend a meeting (an absentee) may send an alternate.
- With prior notification, alternates have voting privileges.
- Absentees may also provide input via another Steering Committee member or send input via the facilitator.
- Three absences in a row without advance notification or without designation of an alternate can lead to removal from the SC.



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Bois d'Arc Lake WPP Partnership Ground Rules

Facilitator Roles

- Coordinate and facilitate meetings to develop and implement the WPP
- Provide technical assistance to the stakeholders
- Draft text and prepare the WPP, incorporating Steering Committee recommendations
- Coordinate educational trainings
- Ensure the Bois d'Arc Lake WPP satisfies EPA requirements



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Bois d'Arc Lake WPP Partnership Ground Rules

Time Frame

- Development of the Bois d'Arc Lake WPP will require at least a 6-month timeline (July-December)
- Monthly meetings
- Implementation beginning in 2022
- The Steering Committee will continue to assist with implementation of the plan

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BOIS D'ARC LAKE WATERSHED PROTECTION PLAN

Watershed Characterization - TWRI

BOIS D'ARC LAKE WPP CHAPTER 2: WATERSHED CHARACTERIZATION

Stephanie deVilleneuve, Allen Berthold- Texas Water Resources Institute

July 21, 2021

Texas Water Resources Institute
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Chapter 2 Description:

Chapter describes the physical and demographic attributes of a watershed that might influence water quality and appropriate management measures

Watershed Description:

Watershed lies within the larger Red River Basin

- The Red River Basin begins in the panhandle and runs east along the Texas-Oklahoma border for approximately 400 miles
- A river basin is defined as the area of land drained by a river and its tributaries

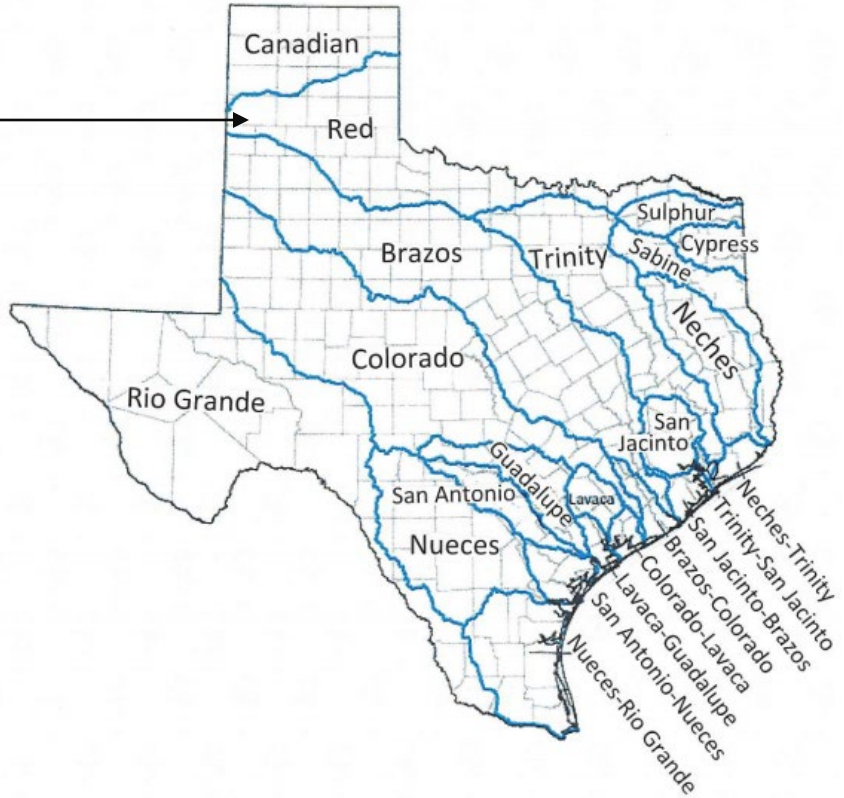
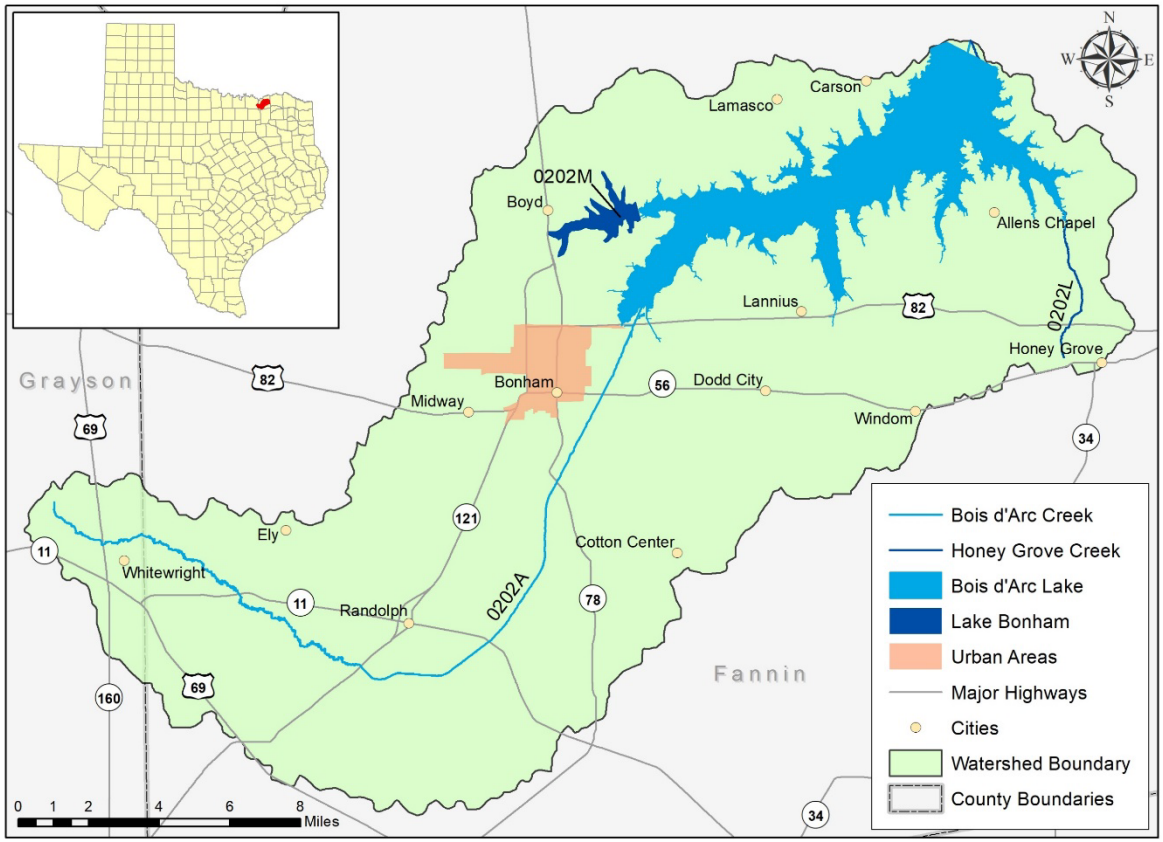


Figure 1.1 Fifteen Major River Basins and Eight Coastal Basins of Texas as Delineated by the TWDB

Watershed Description:

- A watershed is an area of land that drains all the streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel.
- There are four major waterbodies in the Bois d'Arc Lake watershed: Bois d'Arc Creek, Honey Grove Creek, Lake Bonham and Bois d'Arc Lake

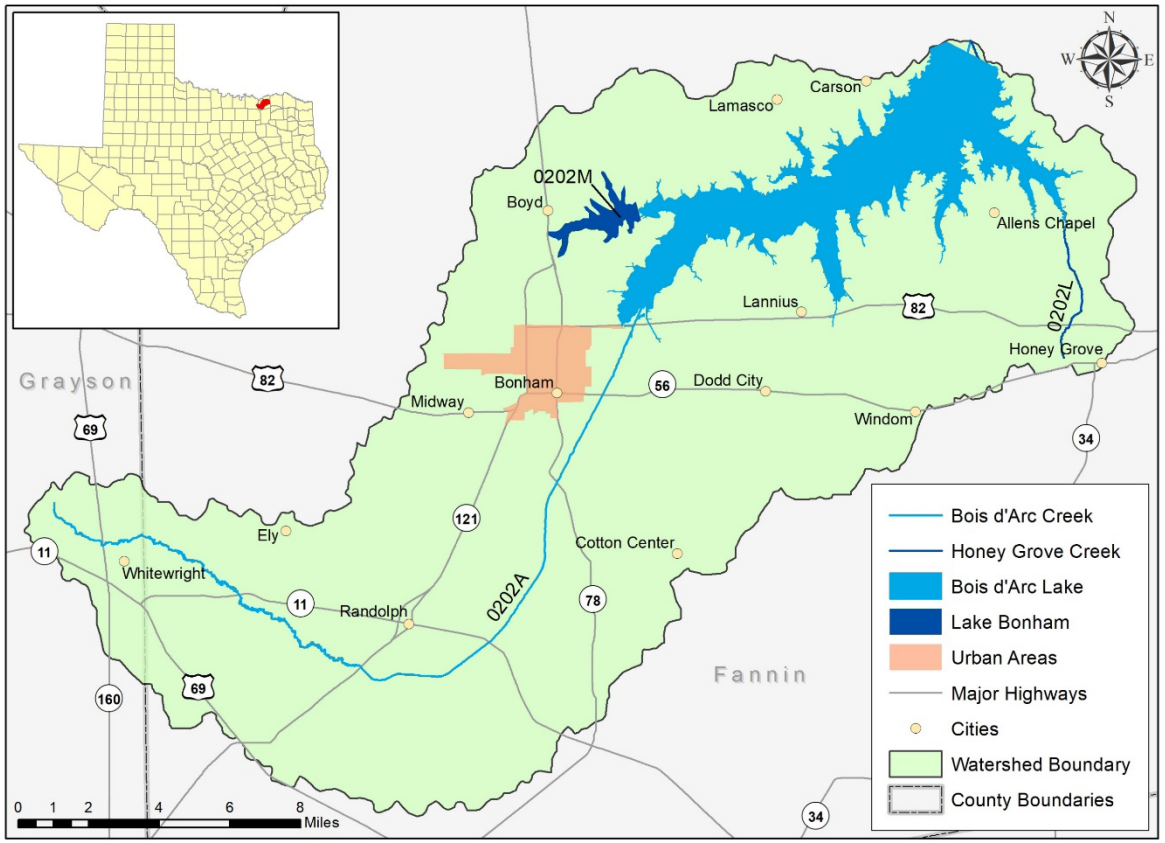


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Watershed Description:

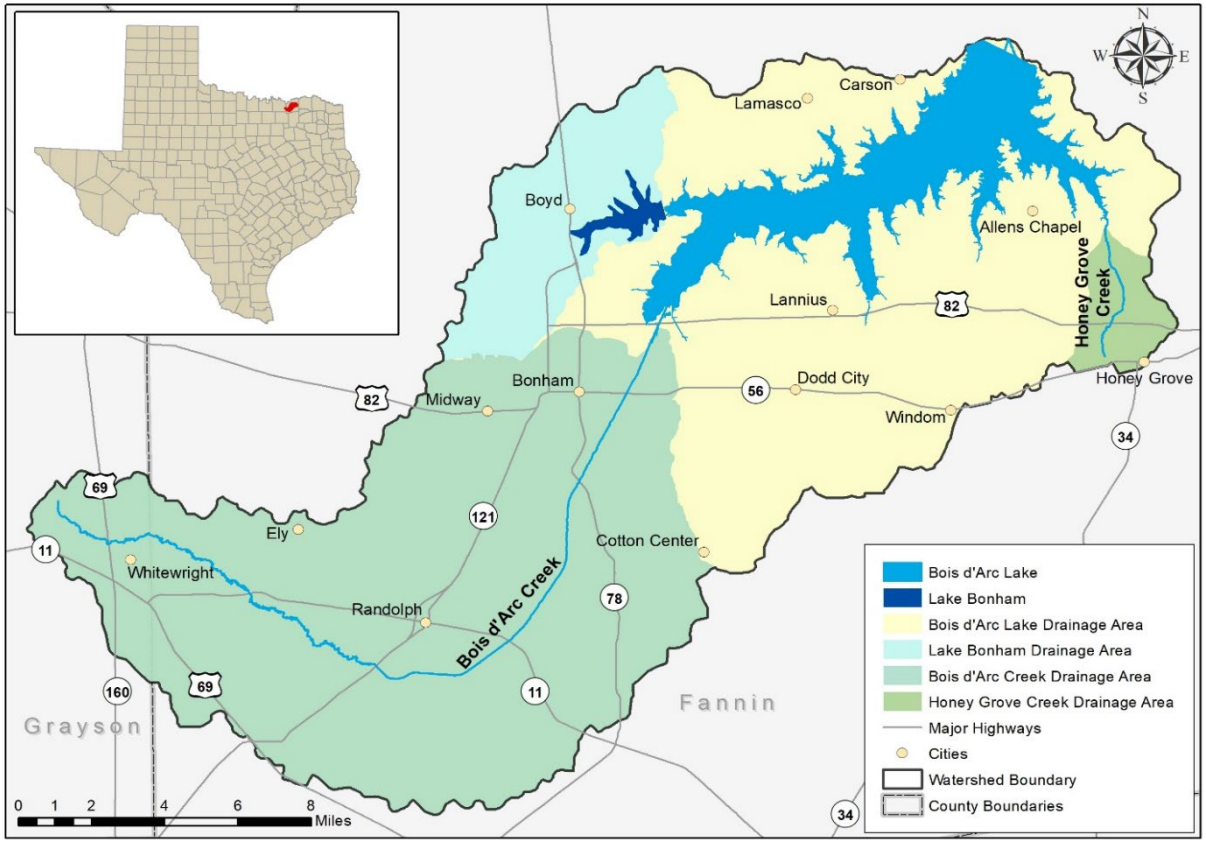
- The Bois d'Arc Lake watershed has seven incorporated towns/cities (municipalities with a charter received from the state): **Bonham, Boyd, Dodd City, Honey Grove, Midway, Whitewright,** and **Windom.**
- There are also seven unincorporated towns in the watershed: **Allens Chapel, Carson, Cotton Center, Ely, Lamasco, Lannius,** and **Randolph.**



Name	USCB Population Estimate	County
Bonham	10,386	Fannin
Boyd	1,518	Fannin
Dodd City	389	Fannin
Honey Grove	1,737	Fannin
Midway	236	Fannin
Whitewright	1,721	Grayson

Watershed Description:

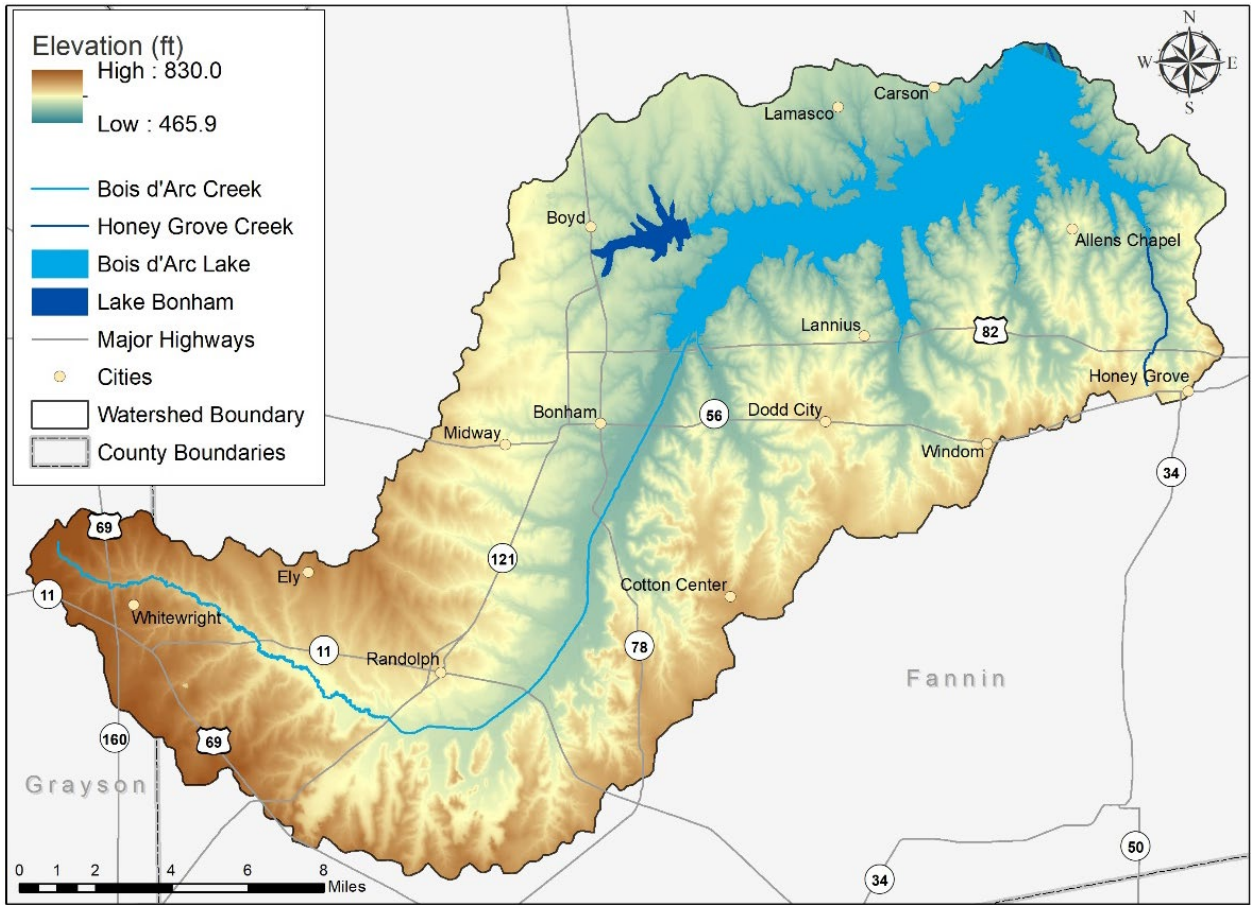
- There are four major subwatersheds (smaller watersheds) within the Bois d'Arc Lake watershed, one for each major waterbody.
- The Bois d'Arc Creek subwatershed is the largest with the Bois d'Arc Lake subwatershed being slightly smaller.



Subwatershed	Percentage of Total	Acres	Sq. Miles
Bois d'Arc Creek	46.2%	96,252	151
Honey Grove Creek	2.22%	4,645	7
Bois d'Arc Lake[1]	43.26%	90,203	141
Lake Bonham[2]	8.32%	17,354	27
Total	100.0%	208,454	326

Topography:

- Slope and elevation define where water will flow
- Watershed is predominantly flat
- Peak elevation of 830 ft and a lowest elevation of 465.9 ft
- 3% slope gradient average across the watershed
- More intense slopes restricted to areas such as cut banks near the creek systems

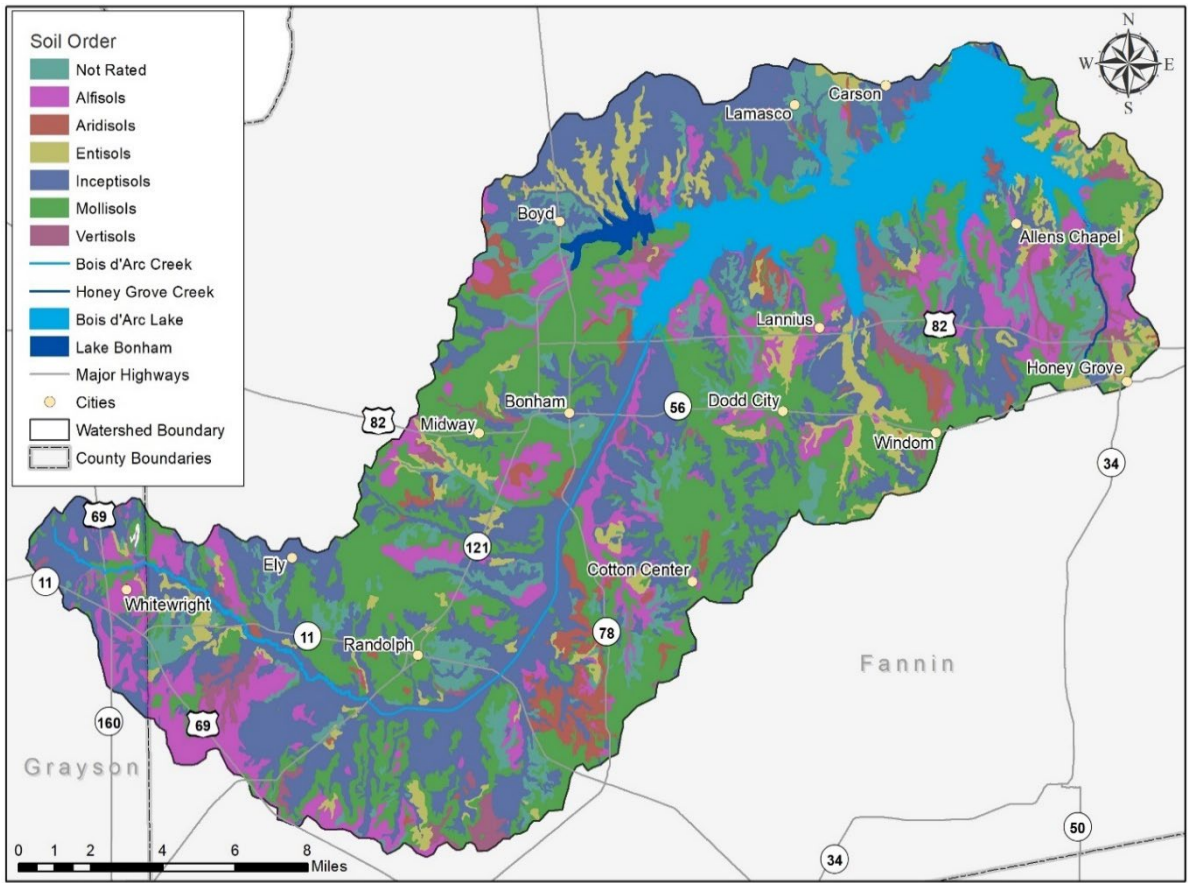


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Soils:

- All soils can be assigned one of 12 soil orders
- Soil orders are defined by a single dominant characteristic affecting soils in that location, e.g., prevalent vegetation, type of parent material, or climate variables
- Inceptisols are the dominant soil order (34.3%) in the watershed. These are young soils that haven't developed unique properties yet
- Mollisols (31.2%) are the second most abundant soil order in the watershed, and they are indicative of high amounts of organic matter and are very fertile and productive for agricultural use

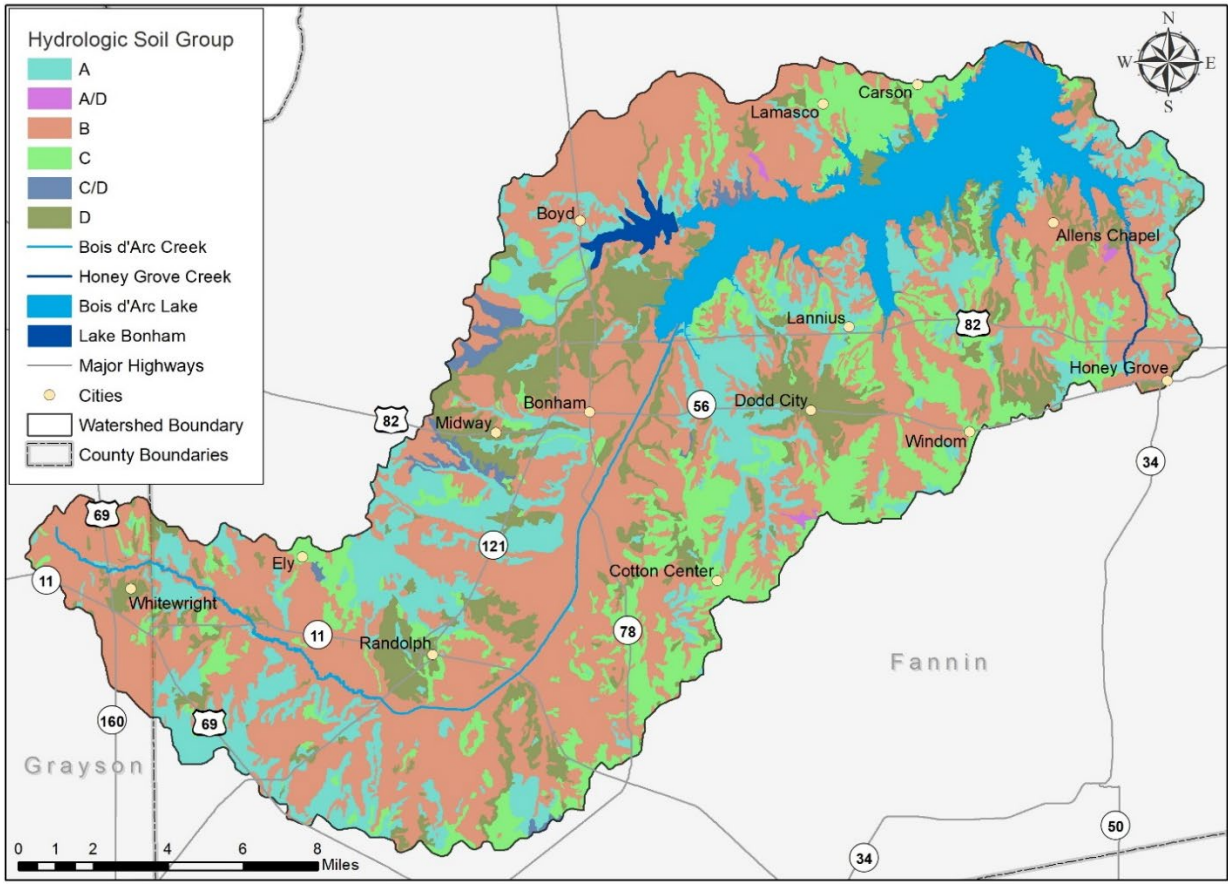


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Hydrologic Soil Group (HSGs):

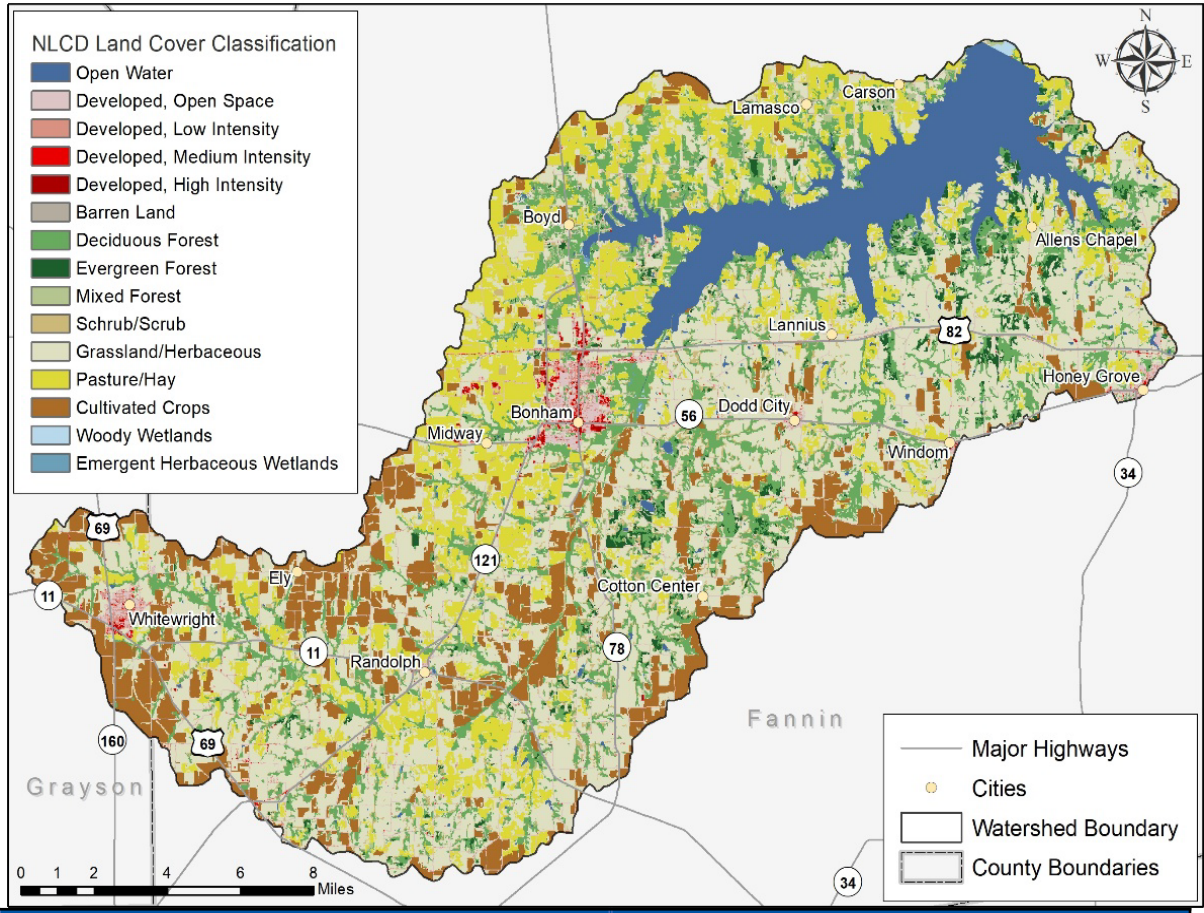
- HSGs are groups of soil with similar runoff potential properties.
- Group A have high infiltration when wet, are deep and well drained. Group D conversely has very slow infiltration and high runoff potential when wet (usually high in clay).
- Groups B and C have moderate and slow infiltration rates.
- The majority of soils in the Bois d'Arc Lake watershed have an HSG of B (42.7%)



Hydrologic Soil Group	Acres	Percent of Total
A	36,383	17.5%
A/D	249	0.1%
B	111,102	42.7%
C	33,546	17.0%
C/D	1,874	0.5%
D	25,301	23.4%

Land Use/Land Cover:

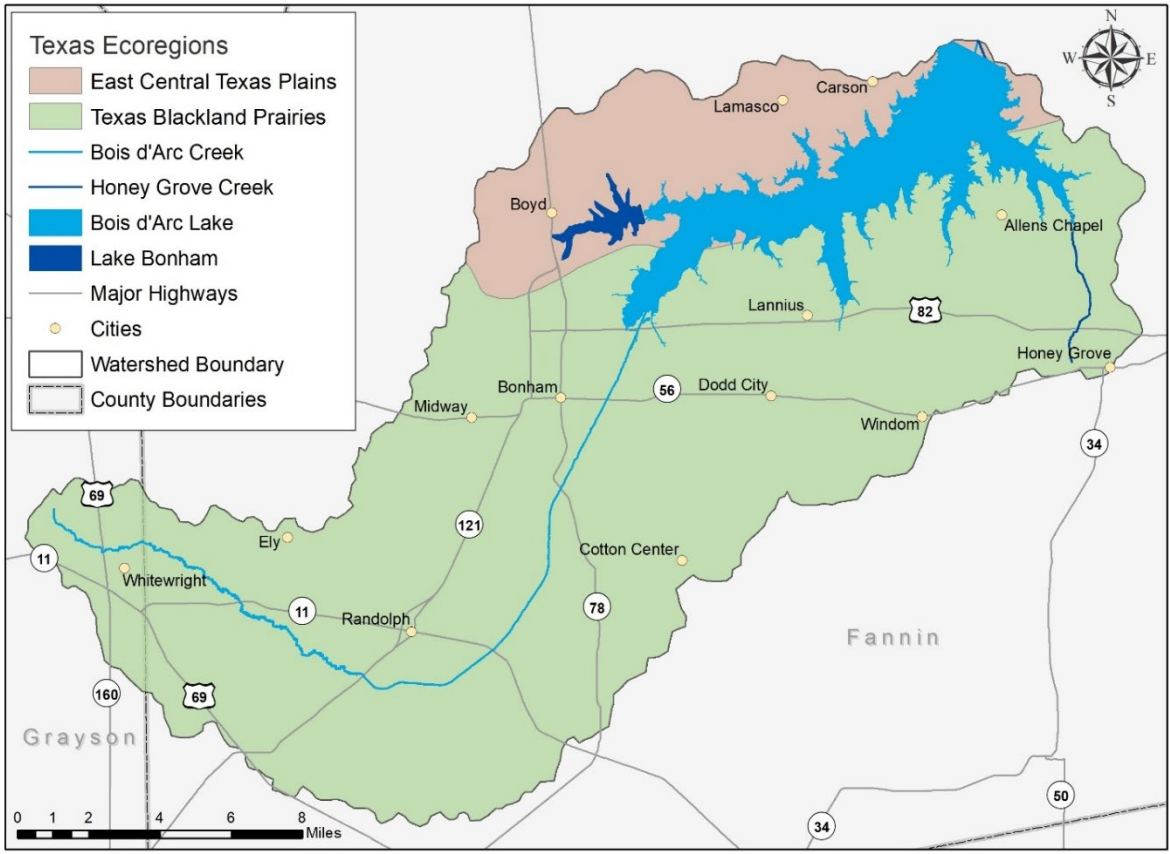
- Rangeland is the predominant land use in the watershed
- Watershed is mostly rural with only around 6% of the land area classified as developed
- Similar land uses were aggregated where appropriate, e.g., the rangeland category includes grasslands and shrubs/scrub



NLCD Classification	Acres	Percent of Total
Rangeland	84,375	40.5%
Forest	35,417	17.0%
Pasture	32,386	15.5%
Cultivated Crops	25,219	12.1%
Open Water	18,449	8.9%
Developed	12,608	6.0%

Ecoregions:

- Ecoregions are defined as areas where ecosystems (and type, quality and quantity of environmental resources) are similar
- Texas Blackland Prairies: dominated by tall grasses, main landcover is cropland and non-native pasture
- East Central Texas Plains: Main landcover is improved pasture, little bluestem and other grasses are predominant



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Water Resources: Surface Water

- **Bois d'Arc Lake:** Will provide treated water for up to 80 communities in 10 North Texas counties. The reservoir covers 16,641 acres of surface area and can store up to 367,609 acre-ft of water. The lake has a maximum depth of 70 feet. The elevation of the lake at conservation pool is 534 ft above msl.
- **Lake Bonham:** Drinking water supply for the City of Bonham. City holds water rights to use up to 5,340 acre-ft of water per year from the lake. Storage capacity of the lake is 11,038 acre-ft with a maximum depth of 29.9 ft. The elevation of the lake at conservation pool is 565 ft above msl.

Water Resources: Groundwater

- Two main aquifers in the watershed: Trinity and the Woodbine aquifers
- The watershed is located in a Priority Groundwater Management Area (PGMA). These are areas that are experiencing or are expected to experience critical groundwater issues in the next 50 years
- The Red River Groundwater Conservation district (RRGCD) was created in 2009 to help manage and protect groundwater in Fannin and Grayson counties

Climate:

- Temperature measurements taken at the Bonham, TX weather station:

*Average Daily Temp. – 62.3°F

*Lowest Average Daily Low Temp. – 30.9°F in January

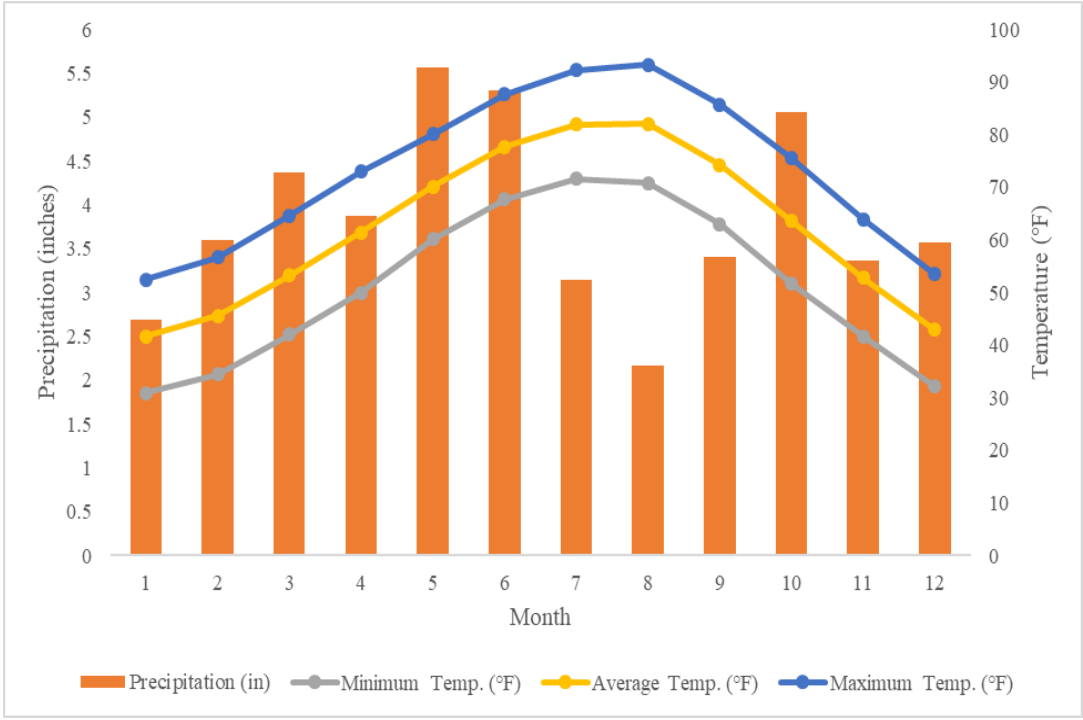
*Highest Average Daily High Temp. – 93.3°F in August

- Monthly normal precipitation (1981-2010):

*Mean Annual Rainfall: 46.1 inches

*Rainfall Peak: May (5.57 inches)

*Rainfall Low: August (2.17 inches)

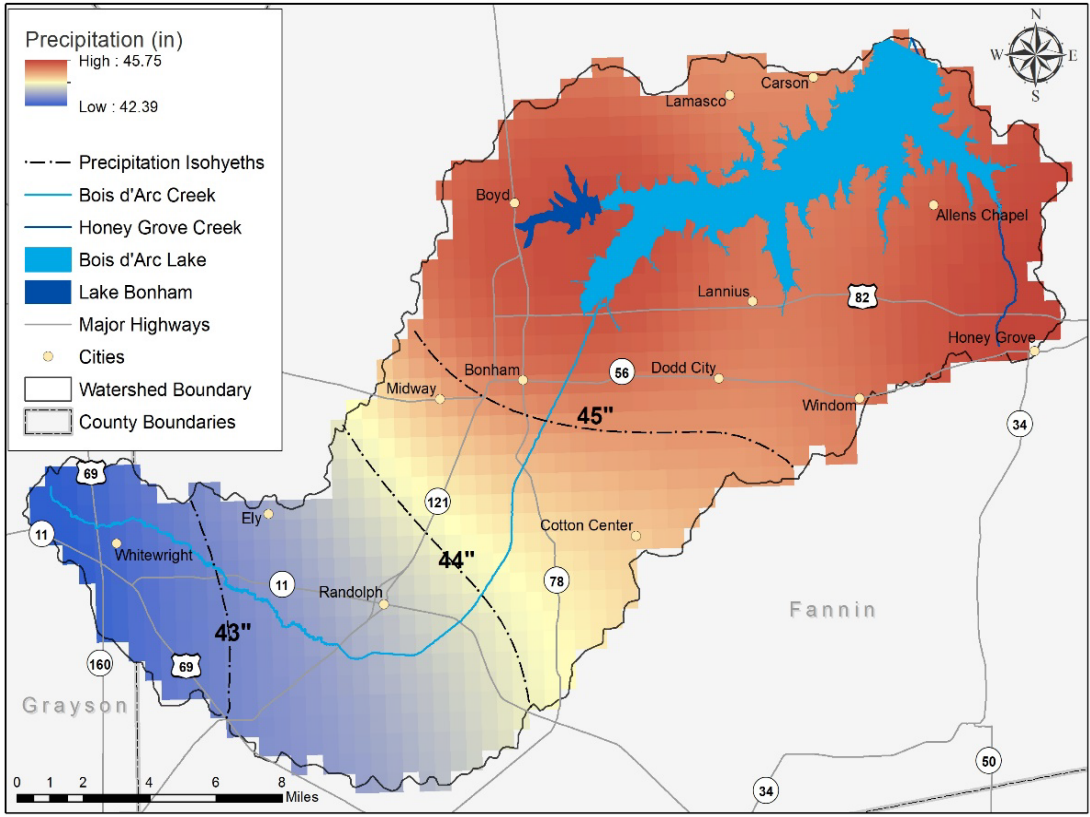


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Climate:

- Average annual precipitation values across the watershed indicate average annual rainfall ranges from 42 to 45 inches per year
- Clear East to West decreasing gradient

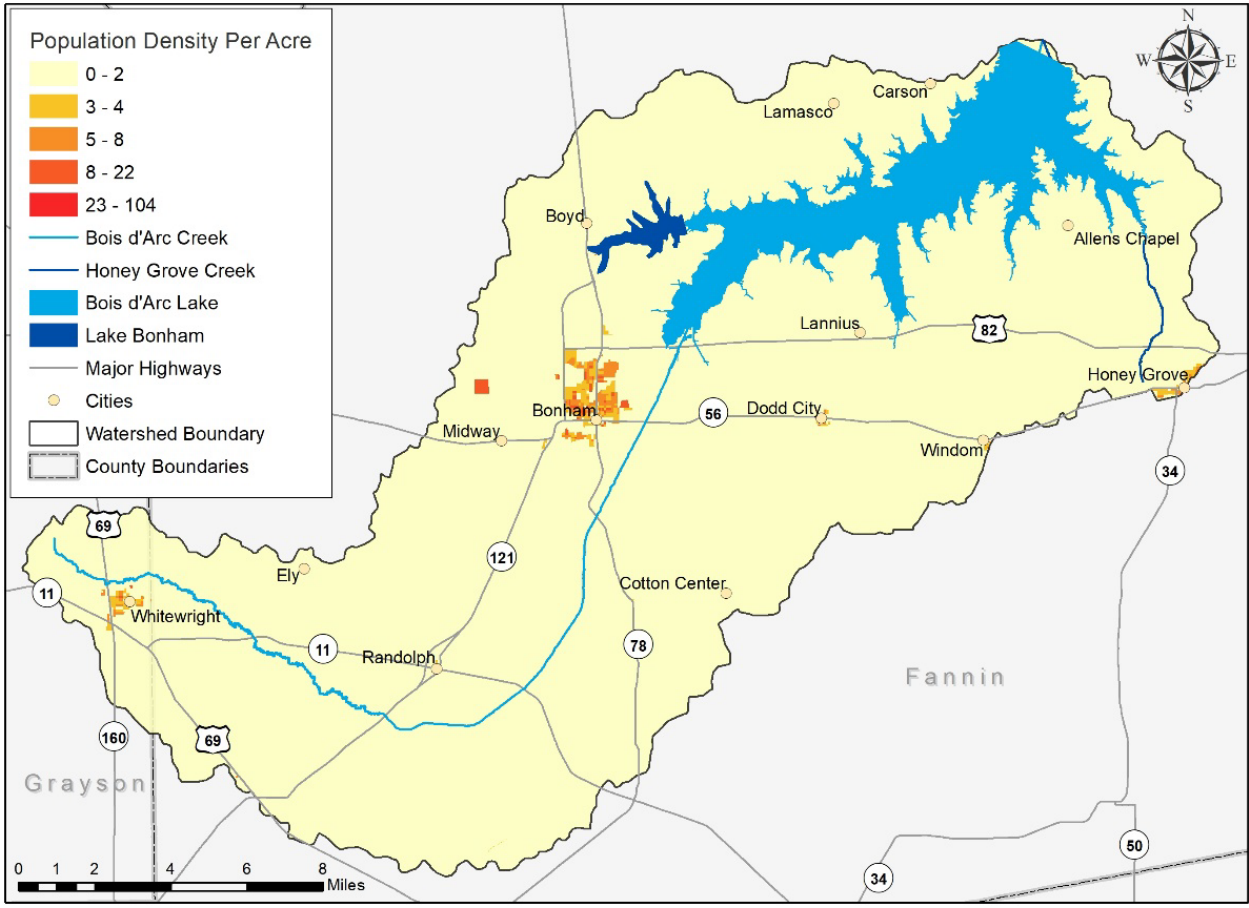


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Population Projections:

- According to the 2010 Census the total population of Bois d'Arc Lake watershed was approximately 20,991
- Population is densest within and near Bonham, Honey Grove, and Whitewright
- Population is projected to increase significantly between 2010 and 2070 with an estimated overall increase for the watershed of almost 300%



County	2010 U.S Census	Projected Population in the Watershed by Year						Percent Increase (2010-2070)
		2020	2030	2040	2050	2060	2070	
Fannin	19,145	21,637	24,321	29,857	39,136	57,413	77,750	306.1
Grayson	1,846	2,066	2,283	2,437	2,732	3,709	5,148	178.9
Total	20,991	23,704	26,604	32,294	41,868	61,122	82,898	294.9

Thank you!

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Next Steps

Partnership Meetings – Propose second Wednesdays

- August 11
- September 8
- October 29
- November 10
- December 8
- January 12, 2022
- Time of day?
- Location?
- Additional meetings (workgroups) may be held, if necessary.



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Next Steps

Partnership Tasks

- Finalize ground rules
- Approve Chapters 1 & 2



BOIS D'ARC LAKE WATERSHED PROTECTION PLAN

Project Web Site

Information clearinghouse for the project

- Meeting information
- Sign up for updates via email
- Maps, data, publications
- Draft reports
- Contacts

- https://boisdarclake.org/construction/the-bois-darc-lake-watershed/



BOIS D'ARC LAKE WATERSHED PROTECTION PLAN

Contacts

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THANK YOU!



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Questions & Discussion



BOIS D'ARC LAKE WATERSHED PARTNERSHIP

Role of the Technical Advisory Committee

- Made up of subject matter experts from state, federal and local agencies
- Provide guidance to the steering committee
- May help with funding during implementation

Typical TAC members:

- A&M Extension
- A&M Research
- TSSWCB
- TDA
- NRCS
- TPWD
- TCEQ
- TPWD
- Others…

Technical Advisory Com.



Bois d'Arc Lake WPP Partnership Ground Rules

Work Groups

- Work groups are an extension of the SC and Partnership that focus on specific topical areas as needed.
- Composed of SC members, technical advisory group members, and any other interested Partnership members.
- Work groups make recommendations and develop components of the WPPs for their topic.
- Meet in-between regular Partnership meetings



Bois d'Arc Lake WPP Partnership Ground Rules

Partnership Commitment

- Individuals do not speak for the SC as a whole unless authorized by the SC.
- Members do not speak for NTWMD or Texas Water Resources Institute unless authorized to do so.
- If Steering Committee spokespersons are needed, they will be selected by the committee.